Term	Subject	Catalog#	Class Sect
Fall 2013	HNSC.	7110X	ET6
Fall 2013	HNSC.	7120X	ET6
Fall 2013	HNSC.	7140X	NET
Fall 2013	HNSC.	7141X	EW6
Fall 2013	HNSC.	7144X	ET6
Fall 2013	HNSC.	7150X	ERQ6
Fall 2013	HNSC.	7163X	EW6
Fall 2013	HNSC.	7920X	ERQ6
Fall 2013	HNSC.	7930X	EM6
Fall 2013	HNSC.	7935X	V1
Fall 2013	HNSC.	7950X	EM6
Fall 2013	HNSC.	7950X	T3
Fall 2013	PUBH	80000	01
Fall 2013	PUBH	80500	01
Fall 2013	PUBH	81100	01
Fall 2013	PUBH	81400	01
Fall 2013	PUBH	82000	01
Fall 2013	PUBH	82100	01
Fall 2013	PUBH	82200	01
Fall 2013	PUBH	83100	01
Fall 2013	PUBH	84000	01
Fall 2013	PUBH	85100	01
Fall 2013	PUBH	85100	02
Fall 2013	PUBH	85100	02
Fall 2013	PUBH	85100	03
Fall 2013	PUBH	85100	04
Fall 2013	PUBH	86100	01
Fall 2013	PUBH	86100	02
Fall 2013	PUBH	86100	03
Fall 2013	PUBH	86100	04
Fall 2013	PUBH	86100	05
Fall 2013	PUBH	87000	01
Fall 2013	PUBH	87100	01
Fall 2013	PUBH	89100	01
Fall 2013	PUBH	89201	01
Fall 2013	PUBH	89202	01
Fall 2013	PUBH	89800	01
Fall 2013	PUBH	89901	01
Fall 2013	PUBH	89901	02
Fall 2013	PUBH	89902	01
Fall 2013	PUBH	89902	02
Fall 2013	PUBH	89904	01
Fall 2013	PUBH	90000	01
Fall 2013	PUBH	90000	02
Fall 2013	PUBH	90000	03

Fall 2013	PUBH	90000	04
Fall 2013	PH	72000	01
Fall 2013	PH	72200	01
Fall 2013	PH	73700	01
Fall 2013	PH	73700	01
Fall 2013	PH	73700	01
Fall 2013	PH	73700	01
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Fall 2013	PH	73800	01
Fall 2013	PH	73800	01
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Fall 2013	PH	75300	02
Fall 2013	PH	75300	02
Fall 2013	PH	75300	02
Fall 2013	PH	75300	02
Fall 2013	PH	75400	01
Fall 2013	PH	75400	02

Fall 2013	PH	75500	01
Fall 2013	PH	75500	02
Fall 2013	PH	75500	03
Fall 2013	PH	75600	01
Fall 2013	PH	75600	02
Fall 2013	PH	75600	03
Fall 2013	PH	77032	01
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Fall 2013	PH	77076	01
Fall 2013	PH	78301	01
Fall 2013	PH	78302	01
Fall 2013	PH	78303	01
Fall 2013	PH	78401	01
Fall 2013	PH	78402	01
Fall 2013	PH	78403	01
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Fall 2013	EPI	77001	01
Fall 2013	EPI	77003	01
Fall 2013	EOHS	70200	01
Fall 2013	EOHS	70500	01
Fall 2013	EOHS	74100	01
Fall 2013	EOHS	74100	01
Fall 2013	EOHS	75500	01
Fall 2013	EOHS	76500	01
Fall 2013	EOHS	77020	01
Fall 2013	COMHE	75100	01
Fall 2013	COMHE	75100	02
Fall 2013	COMHE	75400	02
Fall 2013	COMHE	77025	01
Fall 2013	BIOS	75000	01
Fall 2013	BIOS	75100	01
Fall 2013	PHE	600	XW81
Fall 2013	PHE	680	XT81
Fall 2013	PHE	700	XM81
Fall 2013	PHE	702	XT81
Fall 2013	PHE	704	81
Fall 2013	PHE	705	VM81

Fall 2013	PHE	710	XM81
Fall 2013	PHE	715	XH81
Fall 2013	PHE	790	XW81
Fall 2013	HNSC.	7999X	V1
Fall 2014	HNSC.	7110X	ET6
Fall 2014	HNSC.	7120X	EW6
Fall 2014	HNSC.	7141X	EM6
Fall 2014	HNSC.	7144X	EM6
Fall 2014	HNSC.	7150X	ERQ6
Fall 2014	HNSC.	7163X	EW6
Fall 2014	HNSC.	7310X	M6
Fall 2014	HNSC.	7920X	EWQ6
Fall 2014	HNSC.	7930X	EM6
Fall 2014	HNSC.	7935X	V1
Fall 2014	HNSC.	7935X	V1
Fall 2014	HNSC.	7950X	ET6
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Fall 2014	PUBH	80000	01
Fall 2014	PUBH	80500	01
Fall 2014	PUBH	81100	01
Fall 2014	PUBH	81400	01
Fall 2014	PUBH	82000	01
Fall 2014	PUBH	82100	01
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Fall 2014	PUBH	84000	01
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Fall 2014	PUBH	86100	12
Fall 2014	PUBH	87100	01
Fall 2014	PUBH	89000	01
Fall 2014	PUBH	89000	01
Fall 2014	PUBH	89100	01
Fall 2014	PUBH	89300	01

Fall 2014	PUBH	89800	01
Fall 2014	PUBH	89800	01
Fall 2014	PUBH	89901	01
Fall 2014	PUBH	89901	02
Fall 2014	PUBH	89901	03
Fall 2014	PUBH	89901	04
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Fall 2014	PH	75000	01
Fall 2014	PH	75000	02
Fall 2014	PH	75000	02
Fall 2014	PH	75000	03
Fall 2014	PH	75000	03
Fall 2014	PH	75000	04

Fall 2014	PH	75000	04
Fall 2014	PH	75000	05
Fall 2014	PH	75000	05
Fall 2014	PH	75000	06
Fall 2014	PH	75000	06
Fall 2014	PH	75100	01
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Fall 2014	PH	77045	01
Fall 2014	PH	78301	01
Fall 2014	PH	78301	01
Fall 2014	PH	78302	01
Fall 2014	PH	78303	01
Fall 2014	PH	78303	01

Fall 2014	PH	78401	01
Fall 2014	PH	78402	01
Fall 2014	PH	78403	01
Fall 2014	NUTR	70000	01
Fall 2014	NUTR	70100	01
Fall 2014	NUTR	72000	01
Fall 2014	NUTR	73300	01
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Fall 2014	NUTR	78300	01
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Fall 2014	HPM	75100	02
Fall 2014	HPM	75300	01
Fall 2014	HPM	75300	02
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Fall 2014	EOHS	76500	01
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Fall 2014	COMHE	75100	02
Fall 2014	COMHE	75400	01
Fall 2014	COMHE	75400	02
Fall 2014	BIOS	75000	01
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Fall 2014	BIOS	75600	01
Fall 2014	PHE	600	XW81
Fall 2014	PHE	685	01
Fall 2014	PHE	685	03
Fall 2014	PHE	700	XM81
Fall 2014	PHE	702	XT81
Fall 2014	PHE	704	81
Fall 2014	PHE	705	VM81
Fall 2014	PHE	710	XM81
Fall 2014	PHE	715	XH81
Fall 2014	PHE	724	03
Fall 2014	PHE	790	XH81
Fall 2014	PHE	790	XW81
Fall 2014	HNSC.	7999X	V1
Fall 2015	HNSC.	7110X	NETA
Fall 2015	HNSC.	7110X	NETB
Fall 2015	HNSC.	7141X	EM6

Fall 2015	HNSC.	7144X	ET6
Fall 2015	HNSC.	7150X	EWQ6
Fall 2015	HNSC.	7163X	ET6
Fall 2015	HNSC.	7310X	ET6
Fall 2015	HNSC.	7920X	ERQ6
Fall 2015	HNSC.	7930X	ER6A
Fall 2015	HNSC.	7930X	ER6B
Fall 2015	HNSC.	7935X	V1
Fall 2015	PUBH	80000	
Fall 2015	PUBH	80500	
Fall 2015	PUBH	80700	
Fall 2015	PUBH	81100	
Fall 2015	PUBH	81400	
Fall 2015	PUBH	81600	
Fall 2015	PUBH	82000	
Fall 2015	PUBH	82100	
Fall 2015	PUBH	82300	
Fall 2015	PUBH	82400	
Fall 2015	PUBH	82500	
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Fall 2015	PUBH	89000	
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Fall 2015	PH	73800	01
Fall 2015	PH	73800	01
Fall 2015	PH	75000	01
Fall 2015	PH	75000	01
Fall 2015	PH	75000	01
Fall 2015	PH	75100	01

Fall 2015	PH	75100	01
Fall 2015	PH	75100	01
Fall 2015	PH	75100	01
Fall 2015	PH	75200	01
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Fall 2015	PH	75200	01
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Fall 2015	PH	75600	02
Fall 2015	PH	75600	03
Fall 2015	PH	77049	01
Fall 2015	PH	77077	01
Fall 2015	PH	78301	01
Fall 2015	PH	78302	01
Fall 2015	PH	78303	01
Fall 2015	PH	78401	01
Fall 2015	PH	78402	01
Fall 2015	PH	78403	01
Fall 2015	NUTR	70000	01
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Fall 2015	NUTR	78100	01
Fall 2015	NUTR	78200	01
Fall 2015	NUTR	78300	01
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Fall 2015	HPM	75300	01
Fall 2015	EPI	75000	01
Fall 2015	EPI	75100	01
Fall 2015	EPI	75500	01
Fall 2015	EPI	77005	01
Fall 2015	EPI	77020	01
Fall 2015	EOHS	70N02	01
Fall 2015	EOHS	70200	01
Fall 2015	EOHS	70500	01
Fall 2015	EOHS	74500	01
Fall 2015	COMHE	75000	01

Fall 2015	COMHE	75100	01
Fall 2015	COMHE	75100	02
Fall 2015	COMHE	75400	01
Fall 2015	COMHE	77085	01
Fall 2015	BIOS	75000	01
Fall 2015	BIOS	75100	01
Fall 2015	PHE	600	XW81
Fall 2015	PHE	685	01
Fall 2015	PHE	685	02
Fall 2015	PHE	685	03
Fall 2015	PHE	700	XM81
Fall 2015	PHE	702	XT81
Fall 2015	PHE	704	81
Fall 2015	PHE	705	VM81
Fall 2015	PHE	710	XM81
Fall 2015	PHE	715	XH81
Fall 2015	PHE	724	XT81
Fall 2015	PHE	790	XW81
Fall 2015	PHE	791	01
Spring 2014	HNSC.	7110X	W3
Spring 2014	HNSC.	7120X	ET6
Spring 2014	HNSC.	7130X	T3
Spring 2014	HNSC.	7140X	NET
Spring 2014	HNSC.	7142X	ET6
Spring 2014	HNSC.	7143X	EW6
Spring 2014	HNSC.	7171X	EW6
Spring 2014	HNSC.	7300X	25BW
Spring 2014	HNSC.	7930X	EW6
Spring 2014	HNSC.	7935X	V1
Spring 2014	HNSC.	7935X	V1
Spring 2014	HNSC.	7950X	EM6
Spring 2014	PUBH	80100	01
Spring 2014	PUBH	80100	01
Spring 2014	PUBH	80500	01
Spring 2014	PUBH	80600	01
Spring 2014	PUBH	81000	01
Spring 2014	PUBH	81600	01
Spring 2014	PUBH	82000	01
Spring 2014	PUBH	82100	01
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Spring 2014	PUBH	85100	01
Spring 2014	PUBH	85100	02
Spring 2014	PUBH	85100	03
Spring 2014	PUBH	85100	04
Spring 2014	PUBH	85100	04
Spring 2014	PUBH	85100	05

Spring 2014	PUBH	85100	06
Spring 2014	PUBH	85100	07
Spring 2014	PUBH	85100	07
Spring 2014	PUBH	86100	01
Spring 2014	PUBH	86100	02
Spring 2014	PUBH	86100	03
Spring 2014	PUBH	86100	04
Spring 2014	PUBH	86100	05
Spring 2014	PUBH	86100	06
Spring 2014	PUBH	86100	07
Spring 2014	PUBH	86100	08
Spring 2014	PUBH	86100	09
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Spring 2014	PUBH	89901	05
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Spring 2014	PUBH	89904	02
Spring 2014	PUBH	89904	03
Spring 2014	PUBH	89904	04
Spring 2014	PUBH	90000	01
Spring 2014	PUBH	90000	02
Spring 2014	PUBH	90000	03

Spring 2014	PUBH	90000	04
Spring 2014	PUBH	90000	05
Spring 2014	PH	71800	01
Spring 2014	PH	72500	01
Spring 2014	PH	73700	01
Spring 2014	PH	73700	01
Spring 2014	PH	73700	01
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Spring 2014	PH	78302	01
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Spring 2014	PH	78401	01
Spring 2014	PH	78402	01
Spring 2014	PH	78403	01
Spring 2014	NUTR	70200	01

Spring 2014	NUTR	70300	01
Spring 2014	NUTR	71000	01
Spring 2014	NUTR	73300	01
Spring 2014	NUTR	78100	01
Spring 2014	NUTR	78200	01
Spring 2014	NUTR	78300	01
Spring 2014	HPM	75000	01
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Spring 2014	EPI	75000	01
Spring 2014	EPI	75100	01
Spring 2014	EPI	75200	01
Spring 2014	EPI	75900	01
Spring 2014	EPI	77005	01
Spring 2014	EPI	77010	01
Spring 2014	EPI	77109	W01
Spring 2014	EOHS	71000	W01
Spring 2014	EOHS	74500	01
Spring 2014	EOHS	74700	01
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Spring 2014	COMHE	75300	01
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Spring 2014	PHE	680	IJ81
Spring 2014	PHE	680	XM81
Spring 2014	PHE	685	01
Spring 2014	PHE	685	03
Spring 2014	PHE	685	04
Spring 2014	PHE	685	05
Spring 2014	PHE	685	IJ01
Spring 2014	PHE	701	XH81
Spring 2014	PHE	703	XW81
Spring 2014	PHE	709	XT81
Spring 2014	PHE	770	XW81
Spring 2015	HNSC.	7120X	ET6
Spring 2015	HNSC.	7130X	EM6
Spring 2015	HNSC.	7140X	NET1

Spring 2015	HNSC.	7142X	ET6
Spring 2015	HNSC.	7143X	EW6
Spring 2015	HNSC.	7164X	EM6
Spring 2015	HNSC.	7171X	EW6
Spring 2015	HNSC.	7300X	EW6
Spring 2015	HNSC.	7930X	EW6
Spring 2015	HNSC.	7935X	V1
Spring 2015	HNSC.	7935X	V1
Spring 2015	HNSC.	7950X	ER6
Spring 2015	HNSC.	7950X	V1
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Spring 2015	PUBH	89901	04
Spring 2015	PUBH	89901	05
Spring 2015	PUBH	89901	06
Spring 2015	PUBH	89902	01
Spring 2015	PUBH	89902	02
Spring 2015	PUBH	89902	03

Spring 2015	PUBH	89902	04
Spring 2015	PUBH	89902	05
Spring 2015	PUBH	89902	06
Spring 2015	PUBH	89902	07
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Spring 2015	PUBH	89902	12
Spring 2015	PUBH	89902	13
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Spring 2015	PUBH	89903	02
Spring 2015	PUBH	89903	03
Spring 2015	PUBH	89903	04
Spring 2015	PUBH	89903	05
Spring 2015	PUBH	89903	06
Spring 2015	PUBH	89903	07
Spring 2015	PUBH	89903	08
Spring 2015	PUBH	89903	09
Spring 2015	PUBH	89903	10
Spring 2015	PUBH	89903	11
Spring 2015	PUBH	89903	12
Spring 2015	PUBH	89903	13
Spring 2015	PUBH	89903	14
Spring 2015	PUBH	89903	15
Spring 2015	PUBH	89904	01
Spring 2015	PUBH	89904	02
Spring 2015	PUBH	89904	03
Spring 2015	PUBH	89904	04
Spring 2015	PUBH	89904	05
Spring 2015	PUBH	89904	06
Spring 2015	PUBH	89904	07
Spring 2015	PUBH	89904	08
Spring 2015	PUBH	89904	09
Spring 2015	PUBH	89904	10
Spring 2015	PUBH	89904	11
Spring 2015	PUBH	89904	12
Spring 2015	PUBH	89904	13
Spring 2015	PUBH	89904	14
Spring 2015	PUBH	90000	01
Spring 2015	PUBH	90000	02
Spring 2015	PUBH	90000	03
Spring 2015	PUBH	90000	04
Spring 2015	PUBH	90000	05
Spring 2015	PUBH	90000	06
Spring 2015	PUBH	90000	07
Spring 2015	PUBH	90000	08

Spring 2015	PH	71100	W01
Spring 2015	PH	72500	01
Spring 2015	PH	73700	01
Spring 2015	PH	73700	01
Spring 2015	PH	73700	01
Spring 2015	PH	73700	01
Spring 2015	PH	73700	01
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Spring 2015	PH	73800	01
Spring 2015	PH	75000	01
Spring 2015	PH	75000	01
Spring 2015	PH	75000	02
Spring 2015	PH	75000	02
Spring 2015	PH	75000	03
Spring 2015	PH	75000	03
Spring 2015	PH	75000	04
Spring 2015	PH	75000	04
Spring 2015	PH	75200	01
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Spring 2015	PH	75200	01
Spring 2015	PH	75200	02
Spring 2015	PH	75200	02
Spring 2015	PH	75200	02
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Spring 2015	PH	75200	03
Spring 2015	PH	75200	03
Spring 2015	PH	75200	04
Spring 2015	PH	75200	04
Spring 2015	PH	75400	01
Spring 2015	PH	75400	02
Spring 2015	PH	75500	01
Spring 2015	PH	75500	01
Spring 2015	PH	75500	03
Spring 2015	PH	75600	01
Spring 2015	PH	77022	01
Spring 2015	PH	77026	01
Spring 2015	PH	77039	01
Spring 2015	PH	77047	01
Spring 2015	PH	77048	01
Spring 2015	PH	77079	01
Spring 2015	PH	77079	01
Spring 2015	PH	78301	01

Spring 2015	PH	78301	W01
Spring 2015	PH	78302	01
Spring 2015	PH	78302	01
Spring 2015	PH	78303	01
Spring 2015	PH	78303	01
Spring 2015	PH	78303	01
Spring 2015	PH	78401	01
Spring 2015	PH	78402	01
Spring 2015	PH	78403	01
Spring 2015	NUTR	70200	01
Spring 2015	NUTR	70300	01
Spring 2015	NUTR	73300	01
Spring 2015	NUTR	73300	01
Spring 2015	NUTR	78100	01
Spring 2015	NUTR	78200	01
Spring 2015	NUTR	78300	01
Spring 2015	HPM	75000	01
Spring 2015	HPM	75000	02
Spring 2015	HPM	75200	W01
Spring 2015	HPM	75400	01
Spring 2015	HPM	75400	01
Spring 2015	HPM	75500	01
Spring 2015	EPI	75000	01
Spring 2015	EPI	75200	01
Spring 2015	EPI	75400	01
Spring 2015	EPI	77001	01
Spring 2015	EPI	77030	01
Spring 2015	EPI	79000	W01
Spring 2015	EOHS	74500	01
Spring 2015	EOHS	74700	01
Spring 2015	EOHS	75400	01
Spring 2015	EOHS	75500	01
Spring 2015	EOHS	75500	01
Spring 2015	EOHS	75700	01
Spring 2015	EOHS	77025	01
Spring 2015	COMHE	75000	01
Spring 2015	COMHE	75200	01
Spring 2015	COMHE	75200	02
Spring 2015	COMHE	75300	01
Spring 2015	COMHE	75300	02
Spring 2015	BIOS	75000	01
Spring 2015	BIOS	75800	01
Spring 2015	BIOS	77001	01
Spring 2015	PHE	606	XM81
Spring 2015	PHE	680	XM81
Spring 2015	PHE	685	01
Spring 2015	PHE	685	02

Spring 2015	PHE	685	03
Spring 2015	PHE	701	XW81
Spring 2015	PHE	709	XT81
Spring 2015	PHE	717	H1LB
Spring 2015	PHE	717	H1LB
Spring 2015	PHE	717	H1LC
Spring 2015	PHE	717	H1LC
Spring 2015	PHE	725	XW81
Spring 2015	PHE	740	IJ2H
Spring 2015	PHE	770	H81
Spring 2015	HNSC.	7999X	V1
Spring 2016	HNSC.	7120X	ET6A
Spring 2016	HNSC.	7120X	ET6B
Spring 2016	HNSC.	7130X	EW6
Spring 2016	HNSC.	7140X	NETA
Spring 2016	HNSC.	7140X	NETB
Spring 2016	HNSC.	7142X	ET6
Spring 2016	HNSC.	7143X	ER6
Spring 2016	HNSC.	7164X	EM6
Spring 2016	HNSC.	7171X	ER6
Spring 2016	HNSC.	7300X	EW6
Spring 2016	HNSC.	7920X	ER6
Spring 2016	HNSC.	7935X	V1
Spring 2016	HNSC.	7999X	V1
Spring 2016	BIOS	75000	01
Spring 2016	BIOS	75200	01
Spring 2016	BIOS	77001	01
Spring 2016	COMHE	75000	01
Spring 2016	COMHE	75200	01
Spring 2016	COMHE	75200	02
Spring 2016	COMHE	75300	01
Spring 2016	COMHE	75300	02
Spring 2016	EOHS	70N01	01
Spring 2016	EOHS	70N01	01
Spring 2016	EOHS	74100	01
Spring 2016	EOHS	75400	01
Spring 2016	EOHS	75700	01
Spring 2016	EOHS	75900	01
Spring 2016	EOHS	76500	01
Spring 2016	EOHS	77025	01
Spring 2016	EPI	75000	01
Spring 2016	EPI	75200	01
Spring 2016	EPI	76100	01
Spring 2016	EPI	76400	01
Spring 2016	EPI	77201	W01
Spring 2016	HPM	75000	01
Spring 2016	HPM	75000	02

Spring 2016	HPM	75200	W01
Spring 2016	HPM	75400	01
Spring 2016	HPM	75500	01
Spring 2016	NUTR	70200	01
Spring 2016	NUTR	70300	01
Spring 2016	NUTR	71000	01
Spring 2016	NUTR	73300	01
Spring 2016	NUTR	78100	01
Spring 2016	NUTR	78200	01
Spring 2016	NUTR	78300	01
Spring 2016	PH	72500	01
Spring 2016	PH	73700	01
Spring 2016	PH	73700	01
Spring 2016	PH	73700	01
Spring 2016	PH	73700	01
Spring 2016	PH	73700	01
Spring 2016	PH	73700	01
Spring 2016	PH	73800	01
Spring 2016	PH	73800	01
Spring 2016	PH	73800	01
Spring 2016	PH	73800	01
Spring 2016	PH	73800	01
Spring 2016	PH	75000	01
Spring 2016	PH	75000	01
Spring 2016	PH	75000	01
Spring 2016	PH	75000	01
Spring 2016	PH	75200	01
Spring 2016	PH	75200	01
Spring 2016	PH	75200	02
Spring 2016	PH	75200	02
Spring 2016	PH	75400	01
Spring 2016	PH	75400	02
Spring 2016	PH	75500	01
Spring 2016	PH	75600	01
Spring 2016	PH	77034	01
Spring 2016	PH	77045	01
Spring 2016	PH	77045	01
Spring 2016	PH	77051	01
Spring 2016	PH	77054	W01
Spring 2016	PH	78301	01
Spring 2016	PH	78301	W01
Spring 2016	PH	78302	01
Spring 2016	PH	78303	01
Spring 2016	PH	78401	01
Spring 2016	PH	78402	01
Spring 2016	PH	78403	01
Spring 2016	PHE	606	XT81

Spring 2016	PHE	680	XW81
Spring 2016	PHE	685	01
Spring 2016	PHE	685	02
Spring 2016	PHE	685	03
Spring 2016	PHE	703	XM81
Spring 2016	PHE	709	XT81
Spring 2016	PHE	717	H1LB
Spring 2016	PHE	717	H1LB
Spring 2016	PHE	717	H1LC
Spring 2016	PHE	717	H1LC
Spring 2016	PHE	718	H1LB
Spring 2016	PHE	718	H1LC
Spring 2016	PHE	725	XW81
Spring 2016	PHE	740	IJ2H
Spring 2016	PHE	770	H81
Spring 2016	PHE	791	H81
Spring 2016	PUBH	801	
Spring 2016	PUBH	805	
Spring 2016	PUBH	806	
Spring 2016	PUBH	807	
Spring 2016	PUBH	810	
Spring 2016	PUBH	820	
Spring 2016	PUBH	822	
Spring 2016	PUBH	842	
Spring 2016	PUBH	851	
Spring 2016	PUBH	851	
Spring 2016	PUBH	851	
Spring 2016	PUBH	851	
Spring 2016	PUBH	851	
Spring 2016	PUBH	851	
Spring 2016	PUBH	870	
Spring 2016	PUBH	891	
Spring 2016	PUBH	891	
Spring 2016	PUBH	898	

Class Title	Instruction Mode	Units	Class Start Time
Soc&Behav Sc Pub Hlt	In Person	3.00	6:30 PM
Epidemiology	In Person	3.00	6:30 PM
Intro Hlth Pol&Admin	Fully Online	3.00	Fully Online
Hlth Care Svcs	In Person	3.00	6:30 PM
Health Economics	In Person	3.00	6:30 PM
Biostat Comm Hlth 1	In Person	3.00	6:30 PM
Comm Needs&Assessmnt	In Person	3.00	6:30 PM
Intership Publ Hlth	In Person	3.00	6:30 PM
Research Seminar 1	In Person	3.00	6:30 PM
Research Seminar 2	In Person	3.00	Arranged
Res Hlth Behavior	In Person	3.00	6:30 PM
Res Hlth Behavior	In Person	3.00	3:40 PM
Cities, Society & He	In Person	3.00	6:30 PM
Qual Resrch Meth/Urb Hlth App	In Person	3.00	6:30 PM
Social/Behavioral Dim Health	In Person	3.00	6:30 PM
Food Policies & Politics	In Person	3.00	6:05 PM
Epidemiological Methods I	In Person	3.00	6:30 PM
Epidemiologic Methods II	In Person	3.00	6:05 PM
Epidemiology Methods III	In Person	3.00	6:05 PM
Env/Occptnl Health Risk Assess	In Person	3.00	6:30 PM
Sem:Health Policy & Management	In Person	3.00	4:15 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:00 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:00 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	4:15 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Mtrnl/Chld/Rprdctv/Sxl Hlth	In Person	3.00	6:05 PM
MCRSH: Life Course Prspctve	In Person	3.00	6:05 PM
Advanced Research Seminar II	In Person	3.00	6:30 PM
Leadership Dev Project 1	In Person	3.00	4:15 PM
Leadership Dev Project II	In Person	3.00	4:15 PM
Dissertation Seminar	In Person	0	4:15 PM
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged

Dissertation Supervision	In Person	0	Arranged
Cities Society & Hth	Web Enhanced	3.00	6:30 PM
Food Politics&Policy	Hybrid	3.00	6:05 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Intro:Biostatistics	Web Enhanced	3.00	5:00 PM
Intro:Biostatistics	Web Enhanced	3.00	5:00 PM
Intro:Biostatistics	Web Enhanced	3.00	5:00 PM
Intro:Biostatistics	Web Enhanced	3.00	5:00 PM
Intro:Biostatistics	Web Enhanced	3.00	6:00 PM
Intro:Biostatistics	Web Enhanced	3.00	6:00 PM
Intro:Biostatistics	Web Enhanced	3.00	6:00 PM
Intro:Biostatistics	Web Enhanced	3.00	6:00 PM
Intro:Biostatistics	Web Enhanced	3.00	6:00 PM
Intro:Biostatistics	Web Enhanced	3.00	6:00 PM
Intro:Biostatistics	Web Enhanced	3.00	6:00 PM
Intro:Biostatistics	Web Enhanced	3.00	6:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	7:00 PM
Intro:Epidemiology	Hybrid	3.00	7:00 PM
Intro:Epidemiology	Hybrid	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	7:00 PM
Intro:Epidemiology	Hybrid	3.00	7:00 PM
Intro:Epidemiology	Hybrid	3.00	5:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:00 PM
Env Health & Safety	Web Enhanced	3.00	6:05 PM
Env Health & Safety	Hybrid	3.00	8:00 PM

Urban Health&Society	Online	3.00	4:10 PM
Urban Health&Society	Web Enhanced	3.00	6:05 PM
Urban Health&Society	Hybrid	3.00	8:00 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Hltcare Qual&Perform	Web Enhanced	3.00	6:05 PM
Int Prsp Gbl Hl Just	Web Enhanced	3.00	4:10 PM
Ecol Dis:Cell Socty	Web Enhanced	3.00	4:10 PM
Indep Study:Pub Hlth	In Person	1.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Indep Study:Pub Hlth	In Person	1.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Di Seminar	Web Enhanced	3.00	6:20 PM
Di Internship	In Person	3.00	Arranged
Community Nutr Educa	Web Enhanced	3.00	5:40 PM
Nutr & Human Devlpmt	Web Enhanced	3.00	10:10 AM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	2.00	Arranged
Independent Study	In Person	3.00	Arranged
Ph & Hlth Care Law	Online	3.00	6:05 PM
Policy Analysis Ph	Online	3.00	6:05 PM
Epidem Methods1:Rsch	Online	3.00	6:30 PM
Epidem Methods2:Srvy	Online	3.00	6:05 PM
Epi Method 3	Online	3.00	6:05 PM
Lifecourse Of Epi	Web Enhanced	3.00	6:05 PM
Intro Occp Safety&Hl	Web Enhanced	3.00	6:05 PM
Environmental Chem	Web Enhanced	3.00	6:05 PM
Env & Indust Hyg Lab	Web Enhanced	4.00	6:05 PM
Env & Indust Hyg Lab	Web Enhanced	4.00	6:05 PM
Indus Vent Env Contr	Web Enhanced	3.00	8:00 PM
Env Investgn & Remed	Web Enhanced	3.00	6:05 PM
Envrnmntl Risk Comm	Web Enhanced	3.00	6:30 PM
Comhe Interventions	Web Enhanced	3.00	6:05 PM
Comhe Interventions	Web Enhanced	3.00	6:05 PM
Research & Eval.	Web Enhanced	3.00	6:05 PM
Maternal&Chld Health	Online	3.00	6:05 PM
Applied Biostat 1	Web Enhanced	3.00	6:05 PM
Applied Biostat 2	Web Enhanced	3.00	6:05 PM
Biostats Public Hea	In Person	3.00	6:00 PM
Topics-Pub. Health	In Person	3.00	6:00 PM
His.&Phil.Pub.Health	In Person	3.00	6:00 PM
Environmental Health	In Person	3.00	6:00 PM
Environmental Health GIScLab	In Person	1.00	8:50 PM
Principles of GISc for Public	In Person	3.00	6:00 PM

App.Res.Meth Pub Hea	In Person	3.00	6:00 PM
Program Plan & Eval.	In Person	3.00	6:00 PM
Pub Hea Capstone Sem	In Person	3.00	6:00 PM
Thesis Research	In Person	3.00	Arranged
Soc&Behav Sc Pub Hlt	In Person	3.00	6:30 PM
Epidemiology	In Person	3.00	6:30 PM
Hlth Care Svcs	In Person	3.00	6:30 PM
Health Economics	In Person	3.00	6:30 PM
Biostat Comm Hlth 1	In Person	3.00	6:30 PM
Comm Needs&Assessmnt	In Person	3.00	6:30 PM
Mat,Chld,Rep & Sexual Hlth	In Person	3.00	6:00 PM
Intership Publ Hlth	In Person	3.00	6:30 PM
Research Seminar 1	In Person	3.00	6:30 PM
Research Seminar 2	In Person	3.00	Arranged
Research Seminar 2	In Person	3.00	Arranged
Res Hlth Behavior	In Person	3.00	6:30 PM
Cities, Society & He	In Person	3.00	6:30 PM
Cities, Society & He	In Person	3.00	6:30 PM
Qual Resrch Meth/Urb Hlth App	In Person	3.00	4:15 PM
Social/Behavioral Dim Health	In Person	3.00	6:30 PM
Food Policies & Politics	In Person	3.00	6:05 PM
Epidemiological Methods I	In Person	3.00	6:30 PM
Epidemiologic Methods II	In Person	3.00	6:05 PM
Applied Biostatistics II	In Person	3.00	6:05 PM
Sem:Health Policy & Management	In Person	3.00	4:15 PM
Sem:Health Policy & Management	In Person	3.00	4:15 PM
Health Policy Analysis Methods	In Person	3.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	8:00 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
MCRSH: Life Course Prspctve	In Person	3.00	6:30 PM
Advanced Research Seminar I	In Person	3.00	4:15 PM
Advanced Research Seminar I	In Person	3.00	4:15 PM
Advanced Research Seminar II	In Person	3.00	4:15 PM
Publin Health Ldrshp Dev Sem	In Person	3.00	4:15 PM

Dissertation Seminar	In Person	0	Arranged
Dissertation Seminar	In Person	0	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
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Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged
Cities Society & Health	Web Enhanced	3.00	6:30 PM
Food Politics & Policy	Hybrid	3.00	6:05 PM
Food Politics & Policy	Hybrid	3.00	6:05 PM
Maternl,Child,Sex &Reprod Hlth	Web Enhanced	3.00	6:30 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM

Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	6:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	6:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	6:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	6:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	7:00 PM
Intro:Epidemiology	Hybrid	3.00	7:00 PM
Intro:Epidemiology	In Person	3.00	5:00 PM
Intro:Epidemiology	In Person	3.00	5:00 PM
Intro:Epidemiology	In Person	3.00	7:00 PM
Intro:Epidemiology	In Person	3.00	7:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:05 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:05 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:05 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:05 PM
Environmental Health & Safety	Web Enhanced	3.00	6:05 PM
Environmental Health & Safety	Web Enhanced	3.00	8:00 PM
Environmental Health & Safety	Web Enhanced	3.00	8:00 PM
Urban Health&Society	Web Enhanced	3.00	6:05 PM
Urban Health&Society	Web Enhanced	3.00	6:05 PM
Urban Health&Society	Hybrid	3.00	8:00 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Adolescent Health, Development	Web Enhanced	3.00	6:05 PM
Reproductive,Sexual Health Pol	Web Enhanced	3.00	6:30 PM
Exploring Evidence:Health Poly	Web Enhanced	3.00	6:05 PM
Comm Ph: From Posters-Pamphlts	Hybrid	3.00	8:00 PM
Indep Study:Pub Health	In Person	1.00	Arranged
Indep Study:Pub Health	In Person	1.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged

Indep Study:Pub Health	In Person	1.00	Arranged
Indep Study:Public Health	In Person	2.00	Arranged
Indep Study:Public Health	In Person	3.00	Arranged
Dietetics Seminar	Web Enhanced	3.00	6:20 PM
Dietetics Internship	Web Enhanced	3.00	Arranged
Community Nutrition Education	Web Enhanced	3.00	5:40 PM
Nutr & Human Development	Web Enhanced	3.00	4:10 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	2.00	Arranged
Independent Study	In Person	3.00	Arranged
Ph & Hlth Care Law	Web Enhanced	3.00	6:05 PM
Ph & Hlth Care Law	Web Enhanced	3.00	6:05 PM
Policy Analysis Ph	Web Enhanced	3.00	6:05 PM
Policy Analysis Ph	Web Enhanced	3.00	6:05 PM
Epidem Methods1:Rsch	Web Enhanced	3.00	6:30 PM
Epidem Methods2:Srvy	Web Enhanced	3.00	6:05 PM
Clincl Trials&Exp Ds	Web Enhanced	3.00	8:00 PM
Epidem Infec Disease	Web Enhanced	3.00	8:00 PM
Intro Occp Safety&Health	Web Enhanced	3.00	6:05 PM
Environmental Chem	Web Enhanced	3.00	6:05 PM
Env & Indust Hyg Lab	Web Enhanced	4.00	6:05 PM
Phys Hazrd:Asses&Con	Web Enhanced	3.00	8:00 PM
Env Investgn & Remed	Web Enhanced	3.00	6:05 PM
Com Hlth Assessment	In Person	3.00	6:05 PM
Comhe Interventions	Hybrid	3.00	6:05 PM
Comhe Interventions	Web Enhanced	3.00	6:05 PM
Research & Eval.	Web Enhanced	3.00	6:05 PM
Research & Eval.	Web Enhanced	3.00	6:05 PM
Applied Biostat 1	Web Enhanced	3.00	6:05 PM
Applied Biostat 2	Web Enhanced	3.00	6:05 PM
Data Analysis	In Person	3.00	5:35 PM
Biostats Public Hea	In Person	3.00	6:00 PM
Independent Study	In Person	3.00	Arranged
Independent Study	In Person	3.00	Arranged
His.&Phil.Pub.Health	In Person	3.00	6:00 PM
Environmental Health	In Person	3.00	6:00 PM
Environmental Health GIScLab	In Person	1.00	8:50 PM
Principles of GISc for Public	In Person	3.00	6:00 PM
App.Res.Meth Pub Hea	In Person	3.00	6:00 PM
Program Plan & Eval.	In Person	3.00	6:00 PM
Maternal&Child Health	In Person	3.00	6:00 PM
Public Health Pract Cap Sem	In Person	3.00	6:00 PM
Public Health Pract Cap Sem	In Person	3.00	6:00 PM
Thesis Research	In Person	3.00	Arranged
Fundmntls of Social&Behav Hlth	Fully Online	3.00	Fully Online
Fundmntls of Social&Behav Hlth	Fully Online	3.00	Fully Online
Hlth Care Svcs	In Person	3.00	6:30 PM

Health Economics	In Person	3.00	6:30 PM
Fundamentals of Biostatistics	In Person	3.00	6:30 PM
Comm Needs&Assessmnt	In Person	3.00	6:30 PM
Mat,Chld,Repr,Sex Hth:Life Crs	Hybrid	3.00	6:30 PM
Supervs Fieldwrk in Publ Hlth	In Person	3.00	6:30 PM
Research Seminar 1	In Person	3.00	6:30 PM
Research Seminar 1	In Person	3.00	6:30 PM
Research Seminar 2	In Person	3.00	Arranged
Cities, Society & He	In Person	3	6:30 PM
Qual Resrch Meth/Urb Hlth App	In Person	3	6:30 PM
Practicum Project	In Person	3	4:15 PM
Social/Behavioral Dim Health	In Person	3	6:30 PM
Food Policies & Politics	In Person	3	6:05 PM
Eval Pub Hlth Prgrms/Policies	In Person	3	4:15 PM
Epidemiological Methods I	In Person	3	6:30 PM
Epidemiologic Methods II	In Person	3	6:05 PM
Epidemiologic Methods IV	In Person	3	6:30 PM
Applied Biostatistics I	In Person	3	6:05 PM
Applied Biostatistics II	In Person	3	6:05 PM
Issues in Urb Occptnl/Env Hlth	In Person	3	4:15 PM
Topics:Int Persp Corp Hlth Democracy	In Person	3	4:00 PM
Topics:Epi Surveillance	In Person	3	8:00 PM
MCRSH: Life Course Prspctve	In Person	3	6:30 PM
Advanced Research Seminar I	In Person	3	4:15 PM
Advanced Research Seminar I	In Person	3	4:15 PM
Advanced Research Seminar II	In Person	3	4:15 PM
Leadsph & Org Chg Sem	In Person	3	6:30 PM
Dissertation Seminar	In Person	0	6:30 PM
Dissertation Seminar	In Person	0	6:30 PM
Dissertation Seminar	In Person	0	6:30 PM
Cities Society & Hth	Web Enhanced	3.00	6:30 PM
Food Politics&Policy	Hybrid	3.00	6:05 PM
Maternl,Child,Sex &Reprod Hlth	Web Enhanced	3.00	6:30 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Intro:Biostatistics	Fully Online	3.00	Fully Online
Intro:Biostatistics	Fully Online	3.00	Fully Online
Intro:Biostatistics	Fully Online	3.00	Fully Online
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM

Princpl:Biostatistic	Web Enhanced	3.00	6:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	6:00 PM
Princpl:Biostatistic	Web Enhanced	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	5:00 PM
Intro:Epidemiology	Hybrid	3.00	7:00 PM
Intro:Epidemiology	Hybrid	3.00	7:00 PM
Intro:Epidemiology	Hybrid	3.00	5:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	8:00 PM
Princpl:Epidemiology	Web Enhanced	3.00	6:00 PM
Env Health & Safety	Partially Online	3.00	6:05 PM
Env Health & Safety	Fully Online	3.00	Fully Online
Urban Health&Society	Hybrid	3.00	8:00 PM
Urban Health&Society	Web Enhanced	3.00	6:05 PM
Urban Health&Society	Hybrid	3.00	6:05 PM
Urban Health&Society	Fully Online	3.00	Fully Online
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Ph&Helth Care Pol&Mg	Fully Online	3.00	Fully Online
Advanced Health Economics	Web Enhanced	3.00	6:05 PM
Corp, Hlth, Democ	Partially Online	3.00	4:10 PM
Indep Study:Pub Hlth	In Person	1.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Indep Study:Pub Hlth	In Person	1.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Dietetics Seminar	Web Enhanced	3.00	6:20 PM
Dietetics Internship	Web Enhanced	3.00	Arranged
Community Nutrition Education	Web Enhanced	3.00	5:25 PM
Nutr & Human Development	Web Enhanced	3.00	6:00 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	2.00	Arranged
Independent Study	In Person	3.00	Arranged
Ph & Hlth Care Law	Web Enhanced	3.00	6:05 PM
Policy Analysis Ph	Web Enhanced	3.00	8:00 PM
Epidem Methods1:Rsch	Web Enhanced	3.00	6:30 PM
Epidem Methods2:Srvy	Web Enhanced	3.00	6:05 PM
Epidem Chronic Dises	Web Enhanced	3.00	8:00 PM
Epidemiological Methods 4	Web Enhanced	3.00	6:30 PM
Ph Surveillance	Web Enhanced	3.00	8:00 PM
Advanced IH Methods	Web Enhanced	4.00	6:05 PM
Intro Occp Safety&Health	Web Enhanced	3.00	6:05 PM
Environmental Chem	Web Enhanced	3.00	8:00 PM
Hazrd Matl&Waste Mng	Web Enhanced	3.00	6:05 PM
Com Hlth Assessment	Partially Online	3.00	4:10 PM

Comhe Interventions	Hybrid	3.00	4:10 PM
Comhe Interventions	Hybrid	3.00	6:05 PM
Research & Eval.	Web Enhanced	3.00	6:05 PM
Qual Methods in P H	Web Enhanced	3.00	6:05 PM
Applied Biostat 1	Web Enhanced	3.00	6:05 PM
Applied Biostat 2	Web Enhanced	3.00	6:05 PM
Biostats Public Hea	In Person	3.00	6:00 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	2.00	Arranged
Independent Study	In Person	3.00	Arranged
His.&Phil.Pub.Health	In Person	3.00	6:00 PM
Environmental Health	In Person	3.00	6:00 PM
Environmental Health GIScLab	In Person	1.00	8:50 PM
Principles of GISc for Public	In Person	3.00	6:00 PM
App.Res.Meth Pub Hea	In Person	3.00	6:00 PM
Program Plan & Eval.	In Person	3.00	6:00 PM
Maternal&Child Health	In Person	3.00	6:00 PM
Public Health Pract Cap Sem	In Person	3.00	6:00 PM
Workshop in GISc Research for	In Person	4.00	Arranged
Soc&Behav Sc Pub Hlt	In Person	3.00	3:40 PM
Epidemiology	In Person	3.00	6:30 PM
Envir Hlth:Urb Com	In Person	3.00	3:40 PM
Intro Hlth Pol&Admin	Fully Online	3.00	Fully Online
Pol&Admin Pub Hlth	In Person	3.00	6:30 PM
Hlth Care Management	In Person	3.00	6:30 PM
Plan/Eval Cmmty Hlth	In Person	3.00	6:30 PM
Mat,Chld,Reprod & Sex Hlth	In Person	3.00	5:30 PM
Research Seminar 1	In Person	3.00	6:30 PM
Research Seminar 2	In Person	3.00	Arranged
Research Seminar 2	In Person	3.00	Arranged
Res Hlth Behavior	In Person	3.00	6:30 PM
Interdisc Urban Health Rsrch	In Person	3.00	6:30 PM
Interdisc Urban Health Rsrch	In Person	3.00	6:30 PM
Qual Resrch Meth/Urb Hlth App	In Person	3.00	4:15 PM
Qual Resrch Meth/Urb Hlth App	In Person	3.00	6:30 PM
Comm Hlth Intrvntn: Thry/Meth	In Person	3.00	4:15 PM
Eval Pub Hlth Prgrms/Policies	In Person	3.00	6:30 PM
Epidemiological Methods I	In Person	3.00	6:05 PM
Epidemiologic Methods II	In Person	3.00	6:30 PM
Epidemiologic Methods IV	In Person	3.00	6:30 PM
Issues in Urb Occptnl/Env Hlth	In Person	3.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	4:00 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:05 PM

Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:05 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:05 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Advanced Research Seminar I	In Person	3.00	4:15 PM
Advanced Research Seminar II	In Person	3.00	4:15 PM
Leadership Dev Project 1	In Person	3.00	4:15 PM
Leadership Dev Project 1	In Person	3.00	4:15 PM
Leadership Dev Project II	In Person	3.00	Arranged
Leadership Dev Project II	In Person	3.00	4:15 PM
Dissertation Seminar	In Person	0	4:15 PM
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
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Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged

Dissertation Supervision	In Person	0	Arranged
Dissertation Supervision	In Person	0	Arranged
Ph Persp Mtl Hlth&Pr	Web Enhanced	3.00	8:00 PM
Maternl,Reprod & Child Hlth	In Person	3.00	5:30 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Env Health & Safety	Web Enhanced	3.00	8:00 PM
Env Health & Safety	Web Enhanced	3.00	6:05 PM
Urban Health&Society	Hybrid	3.00	6:05 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Gis In Public Health	Web Enhanced	3.00	8:00 PM
Hiv/Aids:Glo, Sci, Cltl Con	Hybrid	3.00	6:05 PM
Research: Action Workshop	Web Enhanced	3.00	6:05 PM
Research: Action Workshop	Web Enhanced	3.00	6:05 PM
Health Literacy	Web Enhanced	3.00	4:10 PM
Media:Impact&Advoc, Ph	In Person	3.00	6:05 PM
Media:Impact&Advoc, Ph	In Person	3.00	6:05 PM
Indep Study:Pub Hlth	In Person	1.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Indep Study:Pub Hlth	In Person	1.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
D I Fldwrk:Food Serv	Hybrid	3.00	Arranged

D I Fldwrk:Community	Hybrid	3.00	Arranged
Public Health Nutr	Web Enhanced	3.00	6:05 PM
Nutr & Human Devlpmt	Web Enhanced	3.00	5:10 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	2.00	Arranged
Independent Study	In Person	3.00	Arranged
Public Hlth Mgmt	Web Enhanced	3.00	6:05 PM
Compar Analyes Urb Hlth	Online	3.00	Arranged
Ph Advocacy:Theo&Pra	Web Enhanced	3.00	4:10 PM
Health Economics	Web Enhanced	3.00	8:00 PM
Epidem Methods1:Rsch	Web Enhanced	3.00	6:05 PM
Epidem Methods2:Srvy	Web Enhanced	3.00	6:30 PM
Appld Rsrch:Data Mgt	Web Enhanced	3.00	6:05 PM
Environ&Occupat Epid	In Person	3.00	6:30 PM
Epi Methods 4	In Person	3.00	6:30 PM
Psych & Mtl Hlth Epi	Web Enhanced	3.00	6:05 PM
Data Visualization	Web Enhanced	1.50	6:00 PM
Indust Sfty/Sfty Mgt	Web Enhanced	3.00	5:30 PM
Hazrd Matl&Waste Mng	Web Enhanced	3.00	6:05 PM
Haz Eval Instrument	Web Enhanced	3.00	6:05 PM
Env Occup Toxicology	Web Enhanced	3.00	8:00 PM
Prin Indust Hygiene	Web Enhanced	3.00	6:05 PM
Biohzd & Emerg Resp	Web Enhanced	3.00	6:05 PM
Com Hlth Assessment	Web Enhanced	3.00	4:10 PM
Com Hlth Assessment	Web Enhanced	3.00	6:05 PM
Hlth:Comty Org & Dev	Web Enhanced	3.00	6:05 PM
Hlth:Comty Org & Dev	Web Enhanced	3.00	4:10 PM
Hlth Prog Plan & Fnd	Web Enhanced	3.00	6:05 PM
Applied Biostat 1	Web Enhanced	3.00	6:05 PM
Applied Biostat 2	Web Enhanced	3.00	6:30 PM
Alys of Categor Data	In Person	3.00	7:35 PM
Pub Hea Epidemiology	In Person	3.00	6:00 PM
Topics-Pub. Health	In Person	3.00	5:30 PM
Topics-Pub. Health	In Person	3.00	6:00 PM
Topics-Pub. Health	In Person	3.00	6:00 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	3.00	Arranged
Independent Study	In Person	3.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	3.00	Arranged
Pub Hea Policy& Mgmt	In Person	3.00	6:00 PM
Soc&Behav Dimen Hea	In Person	3.00	6:00 PM
Hea Equity& Soc Just	In Person	3.00	6:00 PM
Pub.Health Internshp	In Person	3.00	6:00 PM
Epidemiology	In Person	3.00	6:30 PM
Envir Hlth:Urb Com	In Person	3.00	6:30 PM
Intro Hlth Pol&Admin	Fully Online	3.00	Fully Online

Pol&Admin Pub Hlth	In Person	3.00	6:30 PM
Hlth Care Management	In Person	3.00	6:30 PM
Hlth Serv Dev & Impl	In Person	3.00	6:30 PM
Plan/Eval Cmmty Hlth	In Person	3.00	6:30 PM
MCRSH: SOCIO-HIST. PERSPECTIVE	In Person	3.00	6:30 PM
Research Seminar 1	In Person	3.00	6:30 PM
Research Seminar 2	In Person	3.00	Arranged
Research Seminar 2	In Person	3.00	Arranged
Res Hlth Behavior	In Person	3.00	6:30 PM
Res Hlth Behavior	In Person	3.00	^;30 PM
Interdisc Urban Health Rsrch	In Person	3.00	6:30 PM
Qual Resrch Meth/Urb Hlth App	In Person	3.00	6:30 PM
Practicum Project	In Person	3.00	4:15 PM
Comm Hlth Intrvntn: Thry/Meth	In Person	3.00	Arranged
Eval Pub Hlth Prgrms/Policies	In Person	3.00	4:15 PM
Epidemiological Methods I	In Person	3.00	6:05 PM
Epidemiology Methods III	In Person	3.00	6:30 PM
Applied Biostatistics I	In Person	3.00	6:05 PM
Quant Meth Hlth Services Rsrch	In Person	3.00	4:15 PM
Public Health Economics	In Person	3.00	6:30 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	4:10 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:00 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	4:15 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	4:15 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	8:00 PM
Topics:Public Hlth Rsrch/Pract	In Person	1.00	6:30 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	1.00	Arranged
Mtrnl/Chld/Rprdctv/Sxl Hlth	In Person	3.00	6:30 PM
Advanced Research Seminar II	In Person	3.00	4:15 PM
Dissertation Seminar	In Person	0	4:15 PM
Dissertation Seminar	In Person	0	4:15 PM
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged
Supervised Dissertation Resrch	In Person	3.00	Arranged

Supervised Dissertation Resrch	In Person	3.00	Arranged

Visl Media,Tech & Hlth	Hybrid	3.00	5:30 PM
Maternl,Reprod & Child Hlth	Web Enhanced	3.00	6:30 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Biostatistics	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Intro:Epidemiology	Hybrid	3.00	6:05 PM
Intro:Epidemiology	Hybrid	3.00	8:00 PM
Environmental Health & Safety	Web Enhanced	3.00	8:00 PM
Environmental Health & Safety	Partially Online	3.00	6:05 PM
Urban Health&Society	Fully Online	3.00	Fully Online
Urban Health&Society	Fully Online	3.00	Fully Online
Urban Health&Society	Fully Online	3.00	Fully Online
Ph&Helth Care Pol&Mg	Web Enhanced	3.00	6:05 PM
Healthy Urban Aging:	Web Enhanced	3.00	6:05 PM
Prod a Public Health Doc	Web Enhanced	3.00	6:05 PM
Public Health Informatics	Web Enhanced	3.00	6:05 PM
Writing Ethnography for PH	Hybrid	3.00	6:05 PM
Social Marketing	Hybrid	3.00	8:00 PM
Research: Action Workshop	Web Enhanced	3.00	6:05 PM
Research: Action Workshop	Web Enhanced	3.00	6:05 PM
Indep Study:Pub Health	Online	1.00	Arranged

Indep Study:Pub Health	Online	1.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Indep Study:Pub Hlth	In Person	1.00	Arranged
Indep Study:Public Health	In Person	2.00	Arranged
Indep Study:Public Health	In Person	3.00	Arranged
Dietetics Fldwrk:Food Serv	Hybrid	3.00	Arranged
Dietetics in Fldwrk:Community	Hybrid	3.00	Arranged
Nutr & Human Development	Web Enhanced	3.00	5:10 PM
Nutr & Human Development	Web Enhanced	3.00	5:10 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	2.00	Arranged
Independent Study	In Person	3.00	Arranged
Public Hlth Mgmt	Web Enhanced	3.00	6:05 PM
Public Hlth Mgmt	Web Enhanced	3.00	6:05 PM
Compar Analyes Urb Hlth	Online	3.00	6:00 PM
Ph Advocacy:Theo&Pra	Web Enhanced	3.00	4:10 PM
Ph Advocacy:Theo&Pra	Web Enhanced	3.00	4:10 PM
Health Economics	Web Enhanced	3.00	6:05 PM
Epidem Methods1:Rsch	Web Enhanced	3.00	6:05 PM
Appld Rsrch:Data Mgt	Web Enhanced	3.00	6:05 PM
Social Epidemiology	Web Enhanced	3.00	8:00 PM
Epi Method 3	Web Enhanced	3.00	6:30 PM
Makng Most Data in R	In Person	3.00	6:30 PM
Quasi-Experimental Studies	In Person	1.50	6:00 PM
Hazrd Matl&Waste Mng	Web Enhanced	3.00	6:05 PM
Haz Eval Instrument	Web Enhanced	3.00	6:05 PM
Env Occup Toxicology	Web Enhanced	3.00	8:00 PM
Indus Vent Env Contr	Partially Online	3.00	8:00 PM
Indus Vent Env Contr	Partially Online	3.00	8:00 PM
Prin Indust Hygiene	Web Enhanced	3.00	6:05 PM
Biohzd & Emerg Resp	Web Enhanced	3.00	6:05 PM
Com Hlth Assessment	Web Enhanced	3.00	6:05 PM
Hlth:Comty Org & Dev	Web Enhanced	3.00	4:10 PM
Hlth:Comty Org & Dev	Web Enhanced	3.00	6:05 PM
Hlth Prog Plan & Fnd	Web Enhanced	3.00	6:05 PM
Hlth Prog Plan & Fnd	Web Enhanced	3.00	6:05 PM
Applied Biostat 1	Web Enhanced	3.00	6:05 PM
Analysis of Variance	In Person	3.00	7:35 PM
Applied Biostat 3	Web Enhanced	3.00	4:15 PM
Pub Hea Epidemiology	Web Enhanced	3.00	6:00 PM
Topics-Pub. Health	Hybrid	3.00	6:00 PM
Independent Study	Web Enhanced	3.00	Arranged
Independent Study	Web Enhanced	3.00	Arranged

Independent Study	In Person	3.00	Arranged
Pub Hea Policy& Mgmt	Hybrid	3.00	6:00 PM
Hea Equity& Soc Just	Web Enhanced	3.00	6:00 PM
The Geography of Urban Health	Hybrid	3.00	6:00 PM
The Geography of Urban Health	Hybrid	3.00	6:00 PM
The Geography of Urban Health	Hybrid	3.00	6:00 PM
The Geography of Urban Health	Hybrid	3.00	6:00 PM
Maternal,Child,Reproduct&Sexua	Web Enhanced	3.00	6:00 PM
Crit Reading/Writing Pub Hlth	Hybrid	2.00	6:00 PM
Pub.Health Internshp	Hybrid	3.00	6:00 PM
Thesis Research	In Person	3.00	Arranged
Fundamentals of Epidemiology	In Person	3.00	6:30 PM
Fundamentals of Epidemiology	In Person	3.00	6:30 PM
Fundmntls of Environmntl Hlth	In Person	3.00	6:30 PM
Fundmntls Hlth Policy&Mangmnt	Fully Online	3.00	Fully Online
Fundmntls Hlth Policy&Mangmnt	Fully Online	3.00	Fully Online
Pol&Admin Pub Hlth	In Person	3.00	6:30 PM
Hlth Care Management	In Person	3.00	6:30 PM
Hlth Serv Dev & Impl	In Person	3.00	6:30 PM
Plan/Eval Cmmty Hlth	In Person	3.00	6:30 PM
MCRSH: SOCIO-HIST. PERSPECTIVE	In Person	3.00	6:30 PM
Supervs Fieldwrk in Publ Hlth	In Person	3.00	6:30 PM
Research Seminar 2	In Person	3.00	Arranged
Thesis Research	In Person	3.00	Arranged
Applied Biostat 1	Web Enhanced	3.00	6:05 PM
Alys of Categor Data	In Person	3.00	7:35 PM
Applied Biostat 3	Web Enhanced	3.00	4:15 PM
Com Hlth Assessment	Web Enhanced	3.00	6:05 PM
Health:Comty Org & Dev	Web Enhanced	3.00	6:05 PM
Health:Comty Org & Dev	Web Enhanced	3.00	4:10 PM
Health Prog Plan & Fnd	Fully Online	3.00	Fully Online
Health Prog Plan & Fnd	Web Enhanced	3.00	6:05 PM
Environmental Rsrch & Writing	Web Enhanced	2.00	6:05 PM
Environmental Rsrch & Writing	Web Enhanced	2.00	6:05 PM
Env & Indust Hygiene Lab	Web Enhanced	4.00	6:05 PM
Environmental Occup Toxicology	Web Enhanced	3.00	8:00 PM
Principles Industrial Hygiene	Web Enhanced	3.00	8:00 PM
Industrial Process Site Visits	Online	3.00	9:00 AM
Env Investgn & Remediation	Hybrid	3.00	6:05 PM
Biohzd & Emerg Resp	Web Enhanced	3.00	6:05 PM
Epidem Methods1:Rsch	Web Enhanced	3.00	6:05 PM
Epidem Methods1:Research Mgmt	Web Enhanced	3.00	6:05 PM
Psych & Mental Health Epi	Web Enhanced	3.00	6:30 PM
Epidemiology Methods 3	Web Enhanced	3.00	6:30 PM
Time Series	Web Enhanced	1.50	6:00 PM
Public Hlth Mgmt	Web Enhanced	3.00	6:05 PM
Public Hlth Mgmt	Web Enhanced	3.00	6:05 PM

Compar Analyses Urb Hlth	Fully Online	3.00	Fully Online
Ph Advocacy:Theo&Pra	Web Enhanced	3.00	4:10 PM
Health Economics	Web Enhanced	3.00	8:00 PM
Dietetics Fldwrk:Food Serv	Hybrid	3.00	Arranged
Dietetics in Fldwrk:Community	Hybrid	3.00	Arranged
Public Health Nutr	Web Enhanced	3.00	6:05 PM
Nutr & Human Development	Web Enhanced	3.00	6:05 PM
Independent Study	In Person	1.00	Arranged
Independent Study	In Person	2.00	Arranged
Independent Study	In Person	3.00	Arranged
Maternl,Reprod & Child Hlth	Web Enhanced	3.00	6:30 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Supervised Fieldwork	Web Enhanced	3.00	8:00 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Capstone Project	Web Enhanced	3.00	6:05 PM
Fundamentals of Biostatistics	Hybrid	3.00	6:05 PM
Fundamentals of Biostatistics	Hybrid	3.00	8:00 PM
Fundamentals of Biostatistics	Hybrid	3.00	8:00 PM
Fundamentals of Biostatistics	Hybrid	3.00	6:05 PM
Fundamentals of Epidemiology	Fully Online	3.00	Fully Online
Fundamentals of Epidemiology	Fully Online	3.00	Fully Online
Fundamentals of Epidemiology	Hybrid	3.00	6:00 PM
Fundamentals of Epidemiology	Hybrid	3.00	8:00 PM
Fund of Environmental Health	Fully Online	3.00	Fully Online
Fund of Environmental Health	Web Enhanced	3.00	8:00 PM
Fund Social & Behavioral Hlth	Fully Online	3.00	Fully Online
Fund of Health Policy & Mgmt	Fully Online	3.00	Fully Online
Adolescent Health, Development	Web Enhanced	3.00	4:10 PM
Comm Ph: From Posters-Pamphlts	Hybrid	3.00	6:05 PM
Comm Ph: From Posters-Pamphlts	Hybrid	3.00	6:05 PM
Global Maternal & Child Health	Hybrid	3.00	8:00 PM
Social Media, Big Data & Hlth	Hybrid	3.00	5:30 PM
Indep Study:Pub Health	Online	1.00	Arranged
Indep Study:Pub Health	Online	1.00	Arranged
Indep Study:Public Health	In Person	2.00	Arranged
Indep Study:Pub Hlth	In Person	3.00	Arranged
Indep Study:Pub Health	In Person	1.00	Arranged
Indep Study:Public Health	In Person	2.00	Arranged
Indep Study:Public Health	In Person	3.00	Arranged
Pub Hea Epidemiology	Web Enhanced	3.00	6:00 PM

Topics-Pub. Health	Web Enhanced	3.00	6:00 PM
Independent Study	Web Enhanced	1.00	Arranged
Independent Study	Web Enhanced	1.00	Arranged
Independent Study	Web Enhanced	1.00	Arranged
Soc&Behav Dimen Hea	Web Enhanced	3.00	6:00 PM
Hea Equity& Soc Just	Web Enhanced	3.00	6:00 PM
The Geography of Urban Health	Hybrid	3.00	5:00 PM
The Geography of Urban Health	Hybrid	3.00	5:00 PM
The Geography of Urban Health	Hybrid	3.00	4:00 PM
The Geography of Urban Health	Hybrid	3.00	4:00 PM
Geostatistics&Spatial Analytic	Web Enhanced	3.00	6:00 PM
Geostatistics&Spatial Analytic	Web Enhanced	3.00	6:00 PM
Maternal,Child,Reproduct&Sexua	Web Enhanced	3.00	6:00 PM
Crit Reading/Writing Pub Hlth	Hybrid	2.00	6:00 PM
Pub.Health Internshp	Hybrid	3.00	6:00 PM
Workshop in GISc Research for	Hybrid	4.00	6:00 PM
Interdisc App	In Person	3	6:30 PM
Quant Meth	In Person	3	4:15 PM
Qual Meth	In Person	3	6:30 PM
Practicum Project	In Person	3	4:15 PM
Community Intervention	In Person	3	Arranged
Epi I	In Person	3	6:05 PM
Epi III	In Person	3	6:30 PM
Pub Health Economics	In Person	3	6:30 PM
Biios III	In Person	3	4:15 PM
Seminar in Health Pol Res for Soc Just	In Person	3	6:30 PM
Seminar in Health Pol Res for Soc Just	In Person	3	6:30 PM
Global Maternal and Child Health	In Person	3	8:00 PM
Ad Meth in Epi	In Person	3	6:30 PM
Public Health Ethics	In Person	3	6:30 PM
MCRSH in Context	In Person	3	6:30 PM
Adv Res Sem II	In Person	3	4:15 PM
Adv Res Sem II	In Person	3	4:15 PM
Dissertation Sem	In Person	0	6:30 PM

Class End Time	Days	Last
9:00 PM	Tu	Greene
9:00 PM	Tu	Oppenheimer
Fully Online	Fully Online	Chu
9:00 PM	W	Haley
8:10 PM	Tu	Thorne
9:50 PM	Th	Gurung
9:00 PM	W	Russell
9:00 PM	Th	Stackhouse
9:00 PM	M	Aikins
Arranged		Balk
9:00 PM	M	Oppenheimer
6:10 PM	Tu	Oppenheimer
8:30 PM	W	Freudenberg
8:30 PM	Th	Gallo
8:30 PM	Th	Levin
8:00 PM	M	Spark
8:30 PM	Tu	Kelvin
8:00 PM	Tu	Schooling
7:50 PM	Tu	Thorpe
8:30 PM	Tu	Mirer
6:15 PM	M	Eastwood
8:00 PM	W	Wyka
8:30 PM	M	Himmelstein
8:30 PM	M	Woolhandler
8:00 PM	W	Horiuchi
6:15 PM	M	Sofaer
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
7:50 PM	Tu	Rothman
7:50 PM	Th	Schooling
8:30 PM	Th	Fahs
6:15 PM	M	Breitbart
6:15 PM	M	Berney
6:15 PM	Tu	Nash
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Borrell
Arranged	Arranged	Sohler
Arranged	Arranged	Freudenberg
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Joyce

Arranged	Arranged	Sembajwe
8:30 PM	W	Freudenberg
7:50 PM	M	Spark
8:45 PM	W	Kelvin
8:45 PM	W	Spark
8:45 PM	W	Mirer
8:45 PM	W	Crum
8:45 PM	W	McDowell
7:50 PM	W	Kelvin
7:50 PM	W	McDowell
7:50 PM	W	Mirer
7:50 PM	W	Spark
7:50 PM	W	Isaac
7:50 PM	M	Wyka
7:50 PM	M	Rendina
7:50 PM	M	Rendina
7:50 PM	M	Wyka
8:50 PM	M	Akhund
8:50 PM	M	Konty
8:50 PM	M	Akhund
8:50 PM	M	Konty
8:50 PM	Th	Akhund
8:50 PM	Th	Wyka
8:50 PM	Th	Akhund
8:50 PM	Th	Wyka
7:50 PM	M	Waldron
7:50 PM	M	Devito
7:50 PM	M	Devito
7:50 PM	M	Waldron
6:50 PM	M	Costa
7:50 PM	M	Dowd
7:50 PM	M	Costa
6:50 PM	M	Dowd
6:50 PM	M	Costa
7:50 PM	M	Dowd
7:50 PM	M	Costa
6:50 PM	M	Dowd
7:50 PM	Th	Costa
9:00 PM	Th	Jones
9:00 PM	Th	Costa
7:50 PM	Th	Jones
7:50 PM	Th	Costa
9:00 PM	Th	Jones
9:00 PM	Th	Costa
7:50 PM	Th	Jones
7:50 PM	Th	Caravanos
9:45 PM	M	Caravanos

5:55 PM	W	Erwin
7:50 PM	W	Manze
9:45 PM	Tu	Kneeshaw-Price
7:50 PM	W	Himmelstein
7:50 PM	W	Woolhandler
7:50 PM	W	Mckenzie
7:50 PM	Tu	McDowell
5:55 PM	M	Freudenberg
5:55 PM	Tu	Isaac
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:10 PM	W	Gaba
Arranged	Arranged	Gaba
8:10 PM	Tu	Leung
12:40 PM	W	Fischer
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
7:50 PM	Th	Geltman
7:50 PM	W	Berney
8:30 PM	Tu	Kelvin
7:50 PM	Tu	Schooling
7:50 PM	Tu	Thorpe
7:50 PM	Th	Schooling
7:50 PM	Tu	Hodge
7:50 PM	M	Mirer
9:45 PM	Th	Caravanos
9:45 PM	Th	Devito
9:45 PM	Tu	Sembajwe
7:50 PM	W	Geltman
8:30 PM	Tu	Mirer
7:50 PM	W	Faber
7:50 PM	M	Mckenzie
7:50 PM	Th	Crum
7:50 PM	Tu	Rothman
7:50 PM	W	Horiuchi
7:50 PM	W	Wyka
8:40 PM	W	Johnson
8:40 PM	Tu	Huynh
8:40 PM	M	Huynh
8:40 PM	Tu	Maroko
9:30 PM	Tu	Maroko
9:30 PM	M	Maroko

8:40 PM	M	Borrell
8:40 PM	Th	Tsui
8:40 PM	W	Borrell
Arranged	Arranged	Grov
9:00 PM	Tu	Greene
9:00 PM	W	Greenberg
9:00 PM	M	Haley
8:10 PM	M	Unuigbe
9:00 PM	Th	Plichta
9:00 PM	W	Russell
8:30 PM	M	Huynh
9:00 PM	W	Stackhouse
9:00 PM	M	Russell
Arranged		Jiang
Arranged		Balk
9:00 PM	Tu	Chu
8:30 PM	M	Huang
8:30 PM	M	Freudenberg
6:15 PM	Th	Gallo
8:30 PM	Th	Viladrich
8:00 PM	M	Spark
8:30 PM	Tu	Kelvin
8:00 PM	Tu	Schooling
8:00 PM	W	Waldron
6:15 PM	Tu	Eastwood
6:15 PM	Tu	Pozen
8:30 PM	W	Sofaer
8:30 PM	M	Woolhandler
8:30 PM	M	Himmelstein
10:00 PM	Th	Nash
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:30 PM	M	Huynh
6:15 PM	M	Romero
6:15 PM	M	Sembajwe
6:15 PM	M	Fahs
6:15 PM	M	Berney

Arranged	Arranged	Sembajwe
Arranged	Arranged	Gallo
Arranged	Arranged	Borrell
Arranged	Arranged	Lennon
Arranged	Arranged	Battle
Arranged	Arranged	Tsui
Arranged	Arranged	Balk
Arranged	Arranged	Hietikko-Parsons
Arranged	Arranged	Levin
Arranged	Arranged	Balk
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Sohler
Arranged	Arranged	Lennon
Arranged	Arranged	Balk
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Sohler
Arranged	Arranged	Balk
Arranged	Arranged	Lennon
Arranged	Arranged	Gallo
Arranged	Arranged	Joyce
Arranged	Arranged	Sembajwe
Arranged	Arranged	Freudenberg
Arranged	Arranged	Borrell
Arranged	Arranged	Sohler
8:30 PM	M	Freudenberg
7:50 PM	M	Heaner
7:50 PM	M	Spark
8:30 PM	M	Huynh
9:45 PM	W	Spark
9:45 PM	W	Chisholm
9:45 PM	W	Thorpe
9:45 PM	W	Faber
9:45 PM	W	Sembajwe
7:50 PM	W	Faber
7:50 PM	W	Chisholm
7:50 PM	W	Thorpe
7:50 PM	W	Mirer
7:50 PM	W	Spark
8:50 PM	M	Akhund
8:50 PM	M	Wyka
8:50 PM	M	Wyka
8:50 PM	M	Akhund
8:50 PM	M	Rendina
8:50 PM	M	Wyka
8:50 PM	M	Wyka

8:50 PM	M	Rendina
8:50 PM	M	Blauschild
8:50 PM	M	Wyka
8:50 PM	M	Blauschild
8:50 PM	M	Wyka
5:50 PM	M	Waldron
7:50 PM	M	Waldron
7:50 PM	M	Devito
5:50 PM	M	Devito
5:50 PM	M	Devito
7:50 PM	M	Waldron
7:50 PM	M	Devito
5:50 PM	M	Waldron
6:50 PM	M	Costa
6:50 PM	M	Bolumar
7:50 PM	M	Costa
7:50 PM	M	Bolumar
6:50 PM	M	Bolumar
6:50 PM	M	Costa
7:50 PM	M	Bolumar
7:50 PM	M	Costa
7:50 PM	Th	Jones
8:50 PM	Th	Costa
8:50 PM	Th	Jones
7:50 PM	Th	Costa
7:50 PM	Th	Costa
8:50 PM	Th	Jones
8:50 PM	Th	Costa
7:50 PM	Th	Jones
7:50 PM	Th	Pavilonis
9:45 PM	M	Ericson
9:45 PM	W	Pavilonis
7:50 PM	Tu	Roberts
7:50 PM	Tu	Singleton
9:45 PM	Tu	Singleton
7:50 PM	W	Woolhandler
7:50 PM	W	Himmelstein
7:50 PM	W	Mckenzie
7:50 PM	W	Roberts
8:30 PM	M	Romero
7:50 PM	Tu	Gallo
9:45 PM	Tu	Dresser
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study

Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:10 PM	W	Gaba
Arranged	Arranged	Gaba
8:10 PM	Tu	Leung
6:40 PM	W	Fischer
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
7:50 PM	Th	Gasner
7:50 PM	Th	Schroth
7:50 PM	W	Berney
7:50 PM	W	Franzosa
8:30 PM	Tu	Kelvin
7:50 PM	Tu	Schooling
9:45 PM	W	Kelvin
9:45 PM	Th	Nash
7:50 PM	Tu	Mirer
7:50 PM	M	Mirer
9:45 PM	Th	Devito
9:45 PM	Tu	Sembajwe
7:50 PM	W	Geltman
7:50 PM	W	Manze
7:50 PM	Tu	Daniels
7:50 PM	Tu	Faber
7:50 PM	Th	Crum
7:50 PM	Th	Apicello
7:50 PM	W	Horiuchi
7:50 PM	W	Waldron
7:25 PM	W	Binkowski
8:40 PM	W	Johnson
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:40 PM	M	Tsui
8:40 PM	Tu	Maroko
9:30 PM	Tu	Maroko
9:30 PM	M	Maroko
8:40 PM	M	Borrell
8:40 PM	Th	Tsui
8:40 PM	M	Huynh
8:40 PM	Th	Huynh
8:40 PM	W	Borrell
Arranged	Arranged	Haley
Fully Online	Fully Online	Greene
Fully Online	Fully Online	Huang
9:00 PM	M	Haley

8:10 PM	Tu	Thorne
9:00 PM	W	Greenberg
9:00 PM	Tu	Shen
8:30 PM	Tu	Huynh
9:00 PM	Th	Stackhouse
9:00 PM	Th	Mirotznik
9:15 PM	Th	Russell
Arranged		Chu
8:30 PM	M	Freudenberg
8:30 PM	W	Pozen
6:15 PM	M	Heller
8:30 PM	Th	Levin
8:00 PM	Th	Cohen
6:15 PM	Tu	Grosskopf
8:30 PM	Tu	Kelvin
8:00 PM	Tu	Jones
8:30 PM	Tu	Schooling
8:00 PM	W	Horiuchi
8:00 PM	W	Waldron
6:15 PM	W	Grassman
6:00 PM	Tu	Freudenberg
9:45 PM	W	Nash
8:30 PM	Tu	Huynh
6:15 PM	M	Sembajwe
6:15 PM	M	Bimbi
6:15 PM	M	Fahs
8:30 PM	M	Cohen
8:30 PM	M	Huang
8:30 PM	M	Kiely
8:30 PM	M	Stimpson
8:30 PM	M	Freudenberg
7:50 PM	Th	Cohen
8:30 PM	Tu	Huynh
9:45 PM	M	Spark
9:45 PM	M	Heller
9:45 PM	M	Brite
9:45 PM	M	Pavilonis
9:45 PM	M	Chisholm
7:50 PM	M	Pavilonis
7:50 PM	M	Chisholm
7:50 PM	M	Brite
7:50 PM	M	Faber
7:50 PM	M	Spark
Fully Online	Fully Online	Wyka
Fully Online	Fully Online	Zhang
Fully Online	Fully Online	Rendina
5:50 PM	M	Waldron

7:50 PM	M	Devito
7:50 PM	M	Waldron
5:50 PM	M	Devito
6:50 PM	M	Costa
7:50 PM	M	Li
7:50 PM	M	Costa
6:50 PM	M	Li
7:50 PM	Th	Jones
8:50 PM	Th	Costa
8:50 PM	Th	Jones
7:50 PM	Th	Costa
7:50 PM	Th	Geltman
Fully Online	Fully Online	Caravanos
9:45 PM	Tu	Roberts
7:50 PM	W	Roberts
7:50 PM	W	Zarcadoolas
Fully Online	Fully Online	Huang
7:50 PM	Tu	Himmelstein
7:50 PM	Tu	Woolhandler
Fully Online	Fully Online	Plichta
7:50 PM	Tu	Pozen
5:55 PM	Tu	Freudenberg
Arranged	Arranged	Independent Study
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8:10 PM	W	Gaba
Arranged	Arranged	Gaba
7:55 PM	Tu	Leung
8:30 PM	Th	Yeh
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
7:50 PM	Th	Lopez
9:45 PM	Th	Berney
8:30 PM	Tu	Kelvin
7:50 PM	Tu	Jones
9:45 PM	Th	Schooling
8:30 PM	Tu	Schooling
9:45 PM	W	Nash
9:45 PM	Th	Pavilonis
7:50 PM	Tu	Sembajwe
9:45 PM	Th	Caravanos
7:50 PM	W	Koshy
5:55 PM	W	Manze

5:55 PM	Th	Cooper
7:50 PM	Tu	Daniels
7:50 PM	Th	Apicello
7:50 PM	W	Romero
7:50 PM	W	Horiuchi
7:50 PM	W	Waldron
8:40 PM	W	Johnson
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:40 PM	M	Tsui
8:40 PM	Tu	Maroko
9:30 PM	Tu	Maroko
9:30 PM	M	Maroko
8:40 PM	M	Borrell
8:40 PM	Th	Tsui
8:40 PM	Tu	Huynh
8:40 PM	W	Borrell
Arranged	Arranged	Johnson
6:10 PM	W	Newsome
9:00 PM	Tu	Oppenheimer
6:10 PM	Tu	Kruszelnicka
Fully Online	Fully Online	Chu
9:00 PM	Tu	Eastwood
9:00 PM	W	Padgug
9:00 PM	W	Eastwood
8:00 PM	Th	Levin
9:00 PM	W	Russell
Arranged		Haley
Arranged		Balk
9:00 PM	M	Levin
8:30 PM	W	Plichta
8:30 PM	W	Lennon
6:15 PM	M	Gallo
8:30 PM	M	Zarcadoolas
6:15 PM	Th	Faber
8:30 PM	Th	Grosskopf
7:50 PM	Tu	Thorpe
8:30 PM	Tu	Jones
8:30 PM	Tu	Schooling
8:30 PM	W	Grassman
8:30 PM	M	Sembajwe
8:30 PM	Th	Delacruz
6:00 PM	M	Freudenberg
8:30 PM	Th	Freudenberg
8:30 PM	Th	Frederickson
7:50 PM	W	Horiuchi

8:30 PM	W	Yang
7:50 PM	M	Poppendieck
7:50 PM	M	Freudenberg
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
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Arranged	Arranged	Independent Study
6:15 PM	M	Sembajwe
6:15 PM	M	Fahs
6:15 PM	M	Breitbart
6:15 PM	M	Berney
Arranged	Arranged	Berney
6:15 PM	M	Breitbart
6:15 PM	M	Nash
Arranged	Arranged	Levin
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Sembajwe
Arranged	Arranged	Sohler
Arranged	Arranged	Plichta
Arranged	Arranged	Romero
Arranged	Arranged	Lennon
Arranged	Arranged	Gallo
Arranged	Arranged	Sembajwe
Arranged	Arranged	Thorpe
Arranged	Arranged	Sohler
Arranged	Arranged	Lennon
Arranged	Arranged	Sofaer
Arranged	Arranged	Borrell
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Sohler
Arranged	Arranged	Borrell
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Sohler
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Joyce

Arranged	Arranged	Sembajwe
Arranged	Arranged	Freudenberg
9:45 PM	Th	Chisholm
8:00 PM	Th	Levin
9:45 PM	W	Thorpe
9:45 PM	W	McDowell
9:45 PM	W	Crum
9:45 PM	W	Mirer
9:45 PM	W	Platkin
7:50 PM	W	Isaac
7:50 PM	W	Thorpe
7:50 PM	W	Mirer
7:50 PM	W	McDowell
7:50 PM	W	Leung
8:50 PM	M	Akhund
8:50 PM	M	Waldron
8:50 PM	M	Akhund
8:50 PM	M	Waldron
8:50 PM	M	Devito
8:50 PM	M	Waldron
8:50 PM	M	Devito
8:50 PM	M	Waldron
7:50 PM	Th	Jones
8:50 PM	Th	Jones
7:50 PM	Th	Costa
8:50 PM	Th	Costa
7:50 PM	Th	Costa
8:50 PM	Th	Costa
9:45 PM	M	Ericson
7:50 PM	W	Geltman
7:50 PM	W	Erwin
7:50 PM	M	Mckenzie
7:50 PM	M	Siegel
9:45 PM	Tu	Thorpe
7:50 PM	W	Daniels
7:50 PM	M	Freudenberg
7:50 PM	M	Poppendieck
5:55 PM	Tu	Zarcadoolas
7:50 PM	Tu	Berney
7:50 PM	Tu	Lieberman
Arranged	Arranged	Independent Study
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Arranged	Arranged	Gaba

Arranged	Arranged	Gaba
7:05 PM	Tu	Leung
7:40 PM	W	Fischer
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
7:50 PM	Th	McDowell
Arranged	Arranged	Plichta
5:55 PM	M	Freudenberg
9:45 PM	W	Gallo
7:50 PM	Tu	Thorpe
8:30 PM	Tu	Jones
7:50 PM	M	Kelvin
8:30 PM	M	Sembajwe
8:30 PM	Tu	Schooling
7:50 PM	Th	Goldmann
9:00 PM	TuTh	Thorpe
8:30 PM	TuTh	Mendelson
7:50 PM	M	Koshy
7:50 PM	Th	Devito
9:45 PM	M	Mirer
7:50 PM	Tu	Schneider
7:50 PM	Th	Hauck
5:55 PM	Tu	Manze
7:50 PM	M	Manze
7:50 PM	Tu	Roberts
5:55 PM	M	Roberts
7:50 PM	Th	Manze
7:50 PM	W	Horiuchi
8:30 PM	W	Yang
9:25 PM	W	Binkowski
8:40 PM	M	Huynh
8:00 PM		Levin
9:45 PM	TuTh	Blazer
8:40 PM	M	Tsui
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:40 PM	Th	Plichta
8:40 PM	W	Baquero
8:40 PM	Tu	Aguirre-molina
8:40 PM	W	Tsui
9:00 PM	Tu	Greenberg
9:00 PM	M	Grassman
Fully Online	Fully Online	Freeman

9:00 PM	Tu	Eastwood
9:00 PM	W	Padgug
9:00 PM	M	Padgug
9:00 PM	W	Eastwood
9:00 PM	W	Rothman
9:00 PM	W	Russell
Arranged		Jiang
Arranged		Axen
9:00 PM	Th	Chu
9:00 PM	M	Chu
8:30 PM	Tu	Cooper
8:30 PM	M	Romero
6:15 PM	M	Heller
Arranged	Arranged	Huang
6:15 PM	W	Grosskopf
7:50 PM	W	Schooling
8:30 PM	W	Thorpe
7:50 PM	Th	Wyka
6:15 PM	Tu	Gallo
8:30 PM	M	Pozen
5:55 PM	M	Freudenberg
8:00 PM	Tu	Freudenberg
6:15 PM	Tu	Grov
6:15 PM	Tu	Wyka
9:45 PM	M	Dowd
8:30 PM	Th	Schooling
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:30 PM	W	Rothman
6:15 PM	M	Fahs
6:15 PM	M	Cooper
6:15 PM	M	Gallo
Arranged	Arranged	Levin
Arranged	Arranged	Sohler
Arranged	Arranged	Kelvin
Arranged	Arranged	Grosskopf
Arranged	Arranged	Pozen
Arranged	Arranged	Berney
Arranged	Arranged	Borrell
Arranged	Arranged	Kelvin
Arranged	Arranged	Battle

Arranged	Arranged	Hietikko-Parsons
Arranged	Arranged	Plichta
Arranged	Arranged	Romero
Arranged	Arranged	Sohler
Arranged	Arranged	Lennon
Arranged	Arranged	Levin
Arranged	Arranged	Grosskopf
Arranged	Arranged	Pozen
Arranged	Arranged	Tsui
Arranged	Arranged	Berney
Arranged	Arranged	Romero
Arranged	Arranged	Kelvin
Arranged	Arranged	Berney
Arranged	Arranged	Tsui
Arranged	Arranged	Levin
Arranged	Arranged	Pozen
Arranged	Arranged	Battle
Arranged	Arranged	Gallo
Arranged	Arranged	Sohler
Arranged	Arranged	Lennon
Arranged	Arranged	Balk
Arranged	Arranged	Grov
Arranged	Arranged	Grosskopf
Arranged	Arranged	Hietikko-Parsons
Arranged	Arranged	Plichta
Arranged	Arranged	Gallo
Arranged	Arranged	Battle
Arranged	Arranged	Grov
Arranged	Arranged	Berney
Arranged	Arranged	Tsui
Arranged	Arranged	Grosskopf
Arranged	Arranged	Romero
Arranged	Arranged	Levin
Arranged	Arranged	Sohler
Arranged	Arranged	Balk
Arranged	Arranged	Lennon
Arranged	Arranged	Pozen
Arranged	Arranged	Plichta
Arranged	Arranged	Hietikko-Parsons
Arranged	Arranged	Gallo
Arranged	Arranged	Thorpe
Arranged	Arranged	Joyce
Arranged	Arranged	Freudenberg
Arranged	Arranged	Borrell
Arranged	Arranged	Sohler
Arranged	Arranged	Balk
Arranged	Arranged	Lennon

8:30 PM	MW	Daniels
8:30 PM	W	Rothman
9:45 PM	W	Faber
9:45 PM	W	Chisholm
9:45 PM	W	Spark
9:45 PM	W	Jones
9:45 PM	W	Pavilonis
9:45 PM	W	Heller
7:50 PM	W	Faber
7:50 PM	W	Jones
7:50 PM	W	Schmeltz
7:50 PM	W	Chisholm
7:50 PM	W	Spark
8:50 PM	M	Rendina
8:50 PM	M	Waldron
8:50 PM	M	Rendina
8:50 PM	M	Waldron
8:50 PM	M	Devito
8:50 PM	M	Waldron
8:50 PM	M	Devito
8:50 PM	M	Waldron
7:50 PM	Th	Costa
8:50 PM	Th	Dowd
8:50 PM	Th	Costa
7:50 PM	Th	Dowd
7:50 PM	Th	Costa
8:50 PM	Th	Dowd
8:50 PM	Th	Costa
7:50 PM	Th	Dowd
7:50 PM	Th	Costa
8:50 PM	Th	Costa
7:50 PM	Th	Costa
8:50 PM	Th	Costa
9:45 PM	M	Ericson
7:50 PM	Th	Geltman
Fully Online	Fully Online	Huang
Fully Online	Fully Online	Flowers
Fully Online	Fully Online	Huang
7:50 PM	W	Mckenzie
7:50 PM	W	Fahs
9:45 PM	Tu	Berney
7:50 PM	Th	Joshi
7:50 PM	W	Singleton
9:45 PM	M	Palmedo
7:50 PM	Tu	Cohen
7:50 PM	Tu	Freudenberg
Arranged	Arranged	Independent Study

Arranged	Arranged	Independent Study
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Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Gaba
Arranged	Arranged	Gaba
7:40 PM	W	Toro Ramos
7:40 PM	W	Navder
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
7:50 PM	Th	Pozen
7:50 PM	Th	Schwartz
8:40 PM	F	Swearingen
5:55 PM	M	Navder
5:55 PM	M	Freudenberg
7:50 PM	M	Gallo
7:50 PM	W	Schooling
7:50 PM	M	Kelvin
9:45 PM	M	Dowd
8:30 PM	W	Thorpe
8:30 PM	Th	Schooling
8:30 PM	TuTh	Johns
7:50 PM	M	Koshy
7:50 PM	Th	Caravanos
9:45 PM	M	Caravanos
9:45 PM	Tu	Devito
9:45 PM	Tu	Sembajwe
7:50 PM	Tu	Pavilonis
7:50 PM	Th	Hauck
7:50 PM	M	Apicello
5:55 PM	M	Roberts
7:50 PM	Tu	Roberts
7:50 PM	Th	Manze
7:50 PM	M	Faber
7:50 PM	Th	Wyka
9:25 PM	W	Dhamoon
6:15 PM	Tu	Wyka
8:40 PM	M	Baquero
8:40 PM	M	Sherry
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study

Arranged	Arranged	Independent Study
8:40 PM	W	Lee
8:40 PM	Tu	Aguirre-molina
8:40 PM	F	Maroko
8:40 PM	F	Maantay
8:40 PM	F	Maantay
8:40 PM	F	Maroko
8:40 PM	W	Maroko
9:45 PM	TuTh	Blazer
8:40 PM	Th	Johnson
Arranged	Arranged	Haley
9:00 PM	Tu	Greenberg
9:00 PM	Tu	McChesney
9:00 PM	W	Singh
Fully Online	Fully Online	Eastwood
Fully Online	Fully Online	Chu
9:00 PM	Tu	Shen
9:00 PM	Th	Padgug
9:00 PM	M	Padgug
9:00 PM	Th	Eastwood
8:30 PM	W	Rothman
9:00 PM	Th	Stackhouse
Arranged		Oppenheimer
Arranged	Arranged	Chu
7:50 PM	Th	Zhang
9:25 PM	Th	Marchev
6:15 PM	Tu	Wyka
7:50 PM	Tu	Daniels
7:50 PM	M	Roberts
5:55 PM	Tu	Roberts
Fully Online	Fully Online	Manze
7:50 PM	Th	Faber
7:50 PM	Tu	Pavilonis
7:50 PM	Tu	Geltman
9:45 PM	Th	Caravanos
9:45 PM	Tu	Mirer
9:45 PM	W	Pavilonis
12:00 PM	W	Pavilonis
7:50 PM	W	Geltman
7:50 PM	Th	Hauck
7:50 PM	W	Schooling
7:50 PM	Tu	Kelvin
8:30 PM	Th	Parcesepe
8:30 PM	W	Kelvin
8:30 PM	TuTh	Verkuilen
7:50 PM	Th	Schwartz
7:50 PM	Tu	Breitbart

Fully Online	Fully Online	Swearingen
5:55 PM	Tu	Freudenberg
9:45 PM	Th	Siegel
Arranged	Arranged	Gaba
Arranged	Arranged	Gaba
7:50 PM	Tu	Leung
7:50 PM	W	Tansman
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:30 PM	W	Rothman
9:45 PM	M	Jones
9:45 PM	M	Heller
9:45 PM	M	Mirer
9:45 PM	M	Faber
9:45 PM	M	Platkin
9:45 PM	M	Berney
7:50 PM	M	Heller
7:50 PM	M	Mirer
7:50 PM	M	Jones
7:50 PM	M	Berney
7:50 PM	M	Gaba
7:50 PM	M	Devito
8:50 PM	M	Wyka
8:50 PM	M	Devito
7:50 PM	M	Wyka
Fully Online	Fully Online	Li
Fully Online	Fully Online	Costa
7:50 PM	Th	Costa
8:50 PM	Th	Costa
Fully Online	Fully Online	Caravanos
9:45 PM	M	Caravanos
Fully Online	Fully Online	Greene
Fully Online	Fully Online	Siegel
5:55 PM	W	Roberts
7:50 PM	M	Zarcadoolas
7:50 PM	M	Vaughon
9:45 PM	Tu	Sherry
8:30 PM	TuTh	Daniels
Arranged	Arranged	Independent Study
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Arranged	Arranged	Independent Study
8:40 PM	Tu	Baquero

8:40 PM	W	Aguirre-molina
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
Arranged	Arranged	Independent Study
8:40 PM	M	Aguirre-molina
8:40 PM	Tu	Aguirre-molina
6:00 PM	F	Maantay
6:00 PM	F	Maroko
5:00 PM	F	Maroko
5:00 PM	F	Maantay
9:30 PM	W	Johnson
9:30 PM	W	Johnson
8:40 PM	W	Maroko
9:40 PM	TuTh	Farrell
8:40 PM	W	Tsui
8:30 PM	F	Maroko
8:30 PM	Tu	Cohen
6:15 PM	W	Zhang
8:30 PM	M	Tsui
6:15 PM	M	Heller
Arranged	Arranged	Huang
7:50 PM	W	Schooling
8:30 PM	W	Kelvin
8:30 PM	Tu	De La Cruz
6:15 PM	Tu	Wyka
8:30 PM	Tu	Himmelstein
8:30 PM	Tu	Woolhandler
9:45 PM	Tu	Sherry
8:30 PM	W	Jones
8:30 PM	Th	Levin
8:30 PM	W	Katz-Rothman
6:15 PM	M	Freudenberg
6:15 PM	M	Echeverria
8:30 PM	M	Sembajwe

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: December 23, 2013

Semester: Fall 2013

Name of Preceptor: Monica Hidalgo / Deborah Acevedo, RN

Agency/Organization: NewYork-Presbyterian Hospital

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	8
2.	Motivation	9
3.	Self-directed resourcefulness	8
4.	Value of the contributions to the Agency	9
5.	Reliability/adherence to promised schedules	9
6.	Interpersonal skills	7 to 8
7.	Overall rating	8

Total number of Agency clinical hours completed: N/A

Preceptor's comments on particular areas of student growth and performance:

[redacted] has been a great addition to our team. With a member of the Outreach staff, she recently started to survey representatives of the service industry surrounding Cornell to gauge interest in and availability for health outreach programming. In the short weeks she has been engaged in this activity, she has had the opportunity to meet several business owners. It seems her comfort level with this interaction is increasing and has improved so much already. I look forward to seeing her continue this work and continue to improve the manner in which she engages with the individuals she meets.

Monica Hidalgo 12/23/14

Signature of Agency Preceptor Date

Student Comments:

[redacted] 12/23/14

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 25
(conferences, CE, etc.)

Total Number of clinical hours completed: 167
(167 hours required)

Grade in clinical portion of course: Pass _____ Fail _____

Signature of Seminar Instructor Date

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Estevan	Sup Last Name:	Garcia

Organization:	Brookdale Hospital Medical center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Very good
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Very good
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Very good
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Very good
Follows policies, rules, regulations, etc.	Very good
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Very good
Clientele	Very good
General public	N/A

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	Very good
Planning health programs/projects	Very good
Implementing programs/projects	Very good
Evaluating programs/projects	Very good
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	Very good
Facilitating group process	Very good

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Very good
Sensitivity	Very good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	M was motivated to learn the system at brookdale and worked on several projects both independently and as part of the performance improvement team. She is eager to participate in as many areas as possible to expand her capacity.
What are the areas needing improvement?	None
Other comments regarding the intern:	We enjoyed having her work with s and would recommend her for future employment if available within the organization.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Rohan	Sup Last Name:	Ellis

Organization:	Woodhull Medical and Mental Health Center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Very good
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Very good
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Very good
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Very good

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Very good
Personnel from other organizations	Excellent
Clientele	Very good
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	Very good
Planning health programs/projects	Very good
Implementing programs/projects	N/A
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	Good
Compiling health data/statistics	N/A
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Very good
Sensitivity	Very good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	Mr B inquisitive nature perseverance thru difficult tasks, multi tasking and is overall knowledge regarding Public Health.
What are the areas needing improvement?	MR B is a excellent worker and so far working with him, he has performed all task giving with no errors
Other comments regarding the intern:	I believe Mr B is ready for the next leader is his career.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name: [redacted]	Int Last Name: [redacted]

Supervisor Information

Sup First Name: Leonardo	Sup Last Name: Vicente

Organization: HELP/PSI, INC.

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Excellent
Developing health objectives	Excellent
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	Excellent
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	Excellent

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	[redacted]s very flexible. He always is available whenever he is needed. He is a very personable individual.
What are the areas needing improvement?	[redacted]needs to gather his thoughts before he tries to communicate them so that he may effectively be able to transmit exactly what he is thinking. He has the ability to analyze a situation well and when he allows his mind to digest the situation he is able to formulate a sound solution.
Other comments regarding the intern:	[redacted]will be an asset in the healthcare industry because he is able to postulate and formulate concepts from many different perspectives.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Paulette	Sup Last Name:	Spencer

Organization:	The Bronx Health Link

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Excellent
Developing health objectives	Excellent
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	N/A
Developing budgets	Excellent
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	Mr. B is a very intelligent, thoughtful and focused person. He is a quick learner and has shown in the quality of his work his regard for professional standard for both the work he did coordinating our Community Health Needs Assessment and as a health educator. He is well versed in public health matters affecting the population of the South Bronx and familiar with qualitative research techniques that can help elucidate the underlying nature of those matters for our clinician partners. Mr. B has had a very good relationship with the staff at The Bronx Health Link. He has a sharp wit and exhibits a warmth of character towards our colleagues.
What are the areas needing improvement?	I have not observed any areas that need improvement.
Other comments regarding the intern:	It has been a pleasure having Mr. B as an intern at The Bronx Health Link.

Future Opportunities

Would you be willing to take another student next semester?	Yes

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: December 2013

Semester: Fall Semester 2013

Name of Preceptor: Dr. Denise Paone, Director of Research and Surveillance
New York City Department of Health and Mental Hygiene
Agency/Organization: Bureau of Alcohol and Drug Use Prevention, Care, and Treatment

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	9
4.	Value of the contributions to the Agency	9
5.	Reliability/adherence to promised schedules	10
6.	Interpersonal skills	9
7.	Overall rating	9.5

Total number of Agency clinical hours completed: 167

Preceptor's comments on particular areas of student growth and performance:

[redacted] is a great asset to our research/surveillance team. She is highly motivated and shows great interest in the content - drug use and drug epidemiology in NYC. [redacted] approaches her tasks with determination; she pays great attention to detail and completes all of her assignments in a timely fashion. [redacted] is open to new experiences; she asks questions appropriately. Overall, [redacted] is a delight to work with and we are looking forward to our ongoing relationship.

Denise Paone 12/9/13

Signature of Agency Preceptor Date

Student Comments:

[redacted] 12/10/13

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: —
(conferences, CE, etc.)

Total Number of clinical hours completed: 167
(167 hours required)

Grade in clinical portion of course: Pass ✓ Fail ____

[redacted] Amo Id, PhD, RN 12/12/2013

Signature of Seminar Instructor Date

TyphonGroup Healthcare Solutions

NPST Student Tracking System - Data Entry Section
TIME LOGS

Hunter College School of Nursing, CUNY (Acct #7321) Boyce, Bonnie is logged in. LOG OUT

Go To Main Menu

TIME LOGS

This report shows your daily time logs, most recent first, formatted in **hours**. Optionally, you can add filters to the report.

FILTERS

Date Range: From To

Course: --All--

Display patient, consult & conference time

Show data as: hours **Show notes** Apply Filters



Add a Daily Time Log

View/Export Results to Excel

Date	Course	Shift Time	Formal Preceptor Consultation	Time Log for Non-Direct Care Clinical Placements	Time Log for N771 Agency Clinical Hours	Time Log for N771 Non-Agency Clinical Hours	Time Log for Agency Clinical Hours	Time Log for Non-Agency Clinical Hours	Time Log for Webinar Hours
12/10/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
12/9/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
12/4/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
12/3/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
11/27/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
11/26/2013	771-Community/Public Heal...	0	0	0	6.5	0	0	0	0
11/20/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
11/19/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
11/13/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
11/12/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
11/6/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
11/4/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
10/30/2013	771-Community/Public Heal...	0	0	0	4	0	0	0	0
10/29/2013	771-Community/Public Heal...	0	0	0	6.5	0	0	0	0
10/23/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
10/22/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
10/16/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
10/15/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
10/9/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
10/8/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
10/2/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
10/1/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
9/25/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
9/24/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
9/18/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
9/17/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
9/11/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0

9/10/2013	771 Community/Public Heal...	0	0	0	6	0	0	0	0
Date	**Course**	**Shift Time**	**Formal Preceptor Consultation**	**Time Log for Non-Direct Care Clinical Placements**	**Time Log for N771 Agency Clinical Hours**	**Time Log for N771 Non-Agency Clinical Hours**	**Time Log for Agency Clinical Hours**	**Time Log for Non-Agency Clinical Hours**	**Time Log for Webinar Hours**
Totals		**0**	**0**	**0**	**167**	**0**	**0**	**0**	**0**

Report generated 12/10/2013 1:33:31 PM ET

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Dean Pal

12/10/13

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Shari	Sup Last Name:	Suchoff

Organization:	Maimonides Medical Center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Very good
Uses time effectively	Good
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Good
Effectiveness in oral communication	Good
Ability to identify problems and proposes solutions	Good
Overall quality or work produced	Very good

B) Work Attitudes

Accepts responsibilities	Very good
Takes initiative	Good
Follows policies, rules, regulations, etc.	Good
Graciously accepts ideas and suggestions	Very good
Perfoms tasks with industry and drive	Very good

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Good
Support staff	Good
Supervisor	Good
Personnel from other organizations	N/A
Clientele	N/A
General public	N/A

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	Good
Implementing programs/projects	Good
Evaluating programs/projects	Good
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	Very good
Facilitating group process	Good

E) Personal Characteristics

Dependability	Very good
Tactfulness	Good
Listening ability	Very good
Sensitivity	Good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Good
What are the outstanding strengths of the intern?	L's work was always good, and he communicated well about his progress and timelines. He met his deadlines and was punctual. He showed interest in the work he was doing here.
What are the areas needing improvement?	L needs to continue to improve his interpersonal skills, although he did make noticeable progress over the course of his internship.
Other comments regarding the intern:	L responded well to our midterm evaluation, and improved considerably on his interpersonal skills.

Future Opportunities

Would you be willing to take another student next semester?	Yes

Comment:

1. J had strong skills in research and writing. She was a good learner who was able to integrate and manipulate information in an effective manner. She was able to complete three major assignments while at the Alliance including two webinars on material that was relatively new to her. She researched the topics carefully, located speakers and managed their presentations in a professional and intelligent fashion. The webinars were very successful and received good evaluations from the participants.

2. J had difficulty estimating how long a task would take her. Her supervisor would help her come up with a list of tasks for accomplishing the Webinars and a timeline for their completion. Admittedly, the topics were challenging and required background research and the assimilation of a fair amount of material. However,, this was cooperative process during which there were multiple check-ins and supports offered. Despite this, J had difficulty estimating how long a task would take and accomplishing her task within the timeframe outlined. Though the Webinars were both completed by the assigned time, it made those around her anxious as to whether they would be done in time.

3. J's work with the Alliance was more challenging than ordinarily because of a transition in staff. About half way through her tenure at the Alliance, her supervisor decided to leave for important career opportunity. As a result, she worked under the supervision of the Executive Director for one month until her supervisor was replaced. Then she worked with a new supervisor for the last two months of her stay. She was a good sport about these transitions and communicated that she learned from each of her supervisors and seemed to think that the experience was a good one.

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date 12/16/13

Semester: Fall 13'

Name of Preceptor: Josefa Chemen RN

Agency/Organization: Center for Comprehensive Health Practice

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	10
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	10
6.	Interpersonal skills	10
7.	Overall rating	10

Total number of Agency clinical hours completed: 174

Preceptor's comments on particular areas of student growth and performance:

It has been a wonderful experience working with [redacted] in her clinical work at the Center for Comprehensive Health Practice. She has spend a majority of her time here working on our Hypertension, Asthma, and Diabetes (HAD) program, which we began 3 years ago to address the educational and preventive needs of our patients with these chronic illnesses. Throughout her time here [redacted] and I have worked together to restructure this program into educational groups (previously only one-on-one education was done), medically supervised with monthly gathered patient data such as BMI.

(continued on back)

RN 12/16/13

Signature of Agency Preceptor Date

Student Comments:

[redacted] 12/17/13

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: _____ (conferences, CE, etc.)

Total Number of clinical hours completed: _____ (167 hours required)

Grade in clinical portion of course: Pass _____ Fail _____

Signature of Seminar Instructor Date

TyphonGroup Healthcare Solutions

NPST Student Tracking System - Data Entry Section
TIME LOGS

Hunter College School of Nursing, CUNY (Acct #7321) [redacted] is logged in. Log Out

Go To Main Menu

TIME LOGS

This report shows your daily time logs, most recent first, formatted in **hours**. Optionally, you can add filters to the report.

FILTERS

Date Range: From To

Course: --All--

☐ **Display patient, consult & conference time**

Show data as: hours ☐ **Show notes** Apply Filters

Add a Daily Time Log

View/Export Results to Excel

Date	Course	Shift Time	Formal Preceptor Consultation	Time Log for Non-Direct Care Clinical Placements	Time Log for N771 Agency Clinical Hours	Time Log for N771 Non-Agency Clinical Hours	Time Log for Agency Clinical Hours	Time Log for Non-Agency Clinical Hours	Time Log for Webinar Hours
12/9/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
12/3/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
12/2/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
11/19/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
11/18/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
11/12/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
11/11/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
11/5/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
11/4/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
10/29/2013	771-Community/Public Heal..	6	0	0	0	0	0	0	0
10/28/2013	771-Community/Public Heal...	6	0	0	0	0	0	0	0
10/22/2013	771-Community/Public Heal...	7.5	0	0	0	0	0	0	0
10/21/2013	771-Community/Public Heal...	8	0	0	0	0	0	0	0
10/15/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
10/14/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
10/8/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
10/7/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
10/1/2013	771-Community/Public Heal...	4	0	0	0	0	0	0	0
9/30/2013	771-Community/Public Heal...	8	0	0	0	0	0	0	0
9/24/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
9/23/2013	771-Community/Public Heal...	8	0	0	0	0	0	0	0
9/17/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
9/16/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
9/10/2013	771-Community/Public Heal...	7	0	0	0	0	0	0	0
9/9/2013	771-Community/Public Heal...	7.5	0	0	0	0	0	0	0
9/5/2013	771-Community/Public Heal...	8	0	0	0	0	0	0	0

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Lisa	Sup Last Name:	Koffler
Organization:	CAMBA		

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Very good
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	N/A
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	N/A
Planning health programs/projects	N/A
Implementing programs/projects	Excellent
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	N/A
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	A has a great rapport with community members and was able to establish most of the program's non-traditional partnerships for condom distribution. She is extremely productive, conveys her enthusiasm for the project to the community, and is a delight to work with.
What are the areas needing improvement?	None.
Other comments regarding the intern:	I have to say that A contributed tremendously to our program. We were struggling at start-up to get enough businesses to buy into our condom distribution program. She just went out into the community and doggedly recruited the majority of our partners - about 130 in total. I see a great future for her as a public health leader and would love to work with her again sometime.

Future Opportunities

Would you be willing to take another student next semester?	Yes

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 12/17/2013

Semester: Fall 2013

Name of Preceptor: Tonya Brown, MS/MPH, Director H.S.

Agency/Organization: Edwin Gould Services for Children & Families

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	9
3.	Self-directed resourcefulness	9
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	9
6.	Interpersonal skills	10
7.	Overall rating	9.5

Total number of Agency clinical hours completed: 172

Preceptor's comments on particular areas of student growth and performance:

[redacted] Came to the agency during a great transition and applied himself to assist any preceptor as it concerned family. [redacted] participated in FP training + developed education material. He was a pleasure to have with our agency.

Signature of Agency Preceptor — Date 12/17/13

Student Comments:

[redacted]

Signature of Student — Date 12/17/2013

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: _____ (conferences, CE, etc.)

Total Number of clinical hours completed: _____ (167 hours required)

Grade in clinical portion of course: Pass _____ Fail _____

Signature of Seminar Instructor — Date

Preceptor's comments on particular areas of student growth and performance:

[redacted] has benefited the agency with development of ppt for FP training. Kegley has developed a sense of community and a different way to assess the needs. It was a pleasure to have him the past 3 semester.

Signature of Agency Preceptor 12/16/14 Date

Student Comments:

I was happy for the opportunity - Great learning experience -

[redacted] 12/16/14

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: _____ (conferences, CE, etc.)

Total Number of clinical hours completed: _____ (167 hours required)

Grade in clinical portion of course: Pass _____ Fail _____

Signature of Seminar Instructor Date

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 12/16/14

Semester: FALL 2014

Name of Preceptor: Tonya Brown.

Agency/Organization: Edwin Gould Services for Children & Families

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	8
3.	Self-directed resourcefulness	8
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	9
6.	Interpersonal skills	10
7.	Overall rating	8

Total number of Agency clinical hours completed: 168

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: December 2013

Semester: Fall Semester 2013

Name of Preceptor: Helena Meiri, Manager, Children and Family Services

Agency/Organization: Centers of Excellence, Visiting Nurse Service of New York

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	
2.	Motivation	
3.	Self-directed resourcefulness	
4.	Value of the contributions to the Agency	
5.	Reliability/adherence to promised schedules	
6.	Interpersonal skills	
7.	Overall rating	[illegible] attached

Total number of Agency clinical hours completed: 144

Preceptor's comments on particular areas of student growth and performance:

Preceptor Evaluation of Student Performance Fall semester 2013
Community Health Nursing

December 2013
Preceptor: Helena Meiri RN-C MA
Manager, Centers of Excellence; Children and Family Services
Visiting Nurse Service of NY

Performance rating: 1-10 1 lowest, 10 highest.

1. Professional Appearance/manner/demeaner: 9
2. Motivation 10
3. Self-directed resourcefulness 8
4. Value of the contributions to the Agency N/A
5. Reliability/adherence to promised schedules 10
6. Interpersonal skills 10
7. Overall rating 47

Total number of Agency clinical hours completed (see logs submitted by student) 144 hours

Preceptor's comments on particular areas of Student growth and performance:

When I first met [redacted] at the start of this experience, she did not yet have a clear vision of her purpose and goals for this community rotation. Together with her professor we had all agreed that she first be afforded an opportunity to be immersed in the homecare experience through observation of nurses in the field. She would also be given the opportunity to attend any continuing education programs being provided to the staff during this time frame. For this reason a specific "project" was not assigned, and I have not rated question #4.
I am very satisfied that this intensive exposure to observing the day to day activities and challenges to nurse in the field and the population being serviced has expanded [redacted] understanding of this specialized area of community health. She is beginning to see how intertwined all areas of the health care system are, the clinical, the financial, the political…..She has in the course of her experiences enthusiastically identified an area she would like to concentrate on for the next two semesters and has begun independently researching the topic of self efficacy in breastfeeding. She has been asking good questions and takes advantage of any opportunity she can to learn and develop her professional expertise in nursing.

Her attendance was reliable and if something came up she clearly communicated to reschedule in a timely fashion.
I would like to see her begin to take a stronger lead now, as we continue to support and guide her, with ideas as to how she can move forward with a community health project. I see many exciting possibilities which can be of benefit to our maternity and pediatric program and hope to flesh something out together with her at our next meeting. We have been placing a greater emphasis on successful breastfeeding especially as we develop postpartum visit packages. Our nurses are in the process of all becoming lactation certified.
I hope to see her continue to grow and develop into a more confident advance practice nurse.

Signature: Helena Meiri December 24th, 2013

Sent electronically by preceptor

PhD, RN

Agency Hours - 144

Signature of Agency Preceptor Date

Student Comments:

[redacted] 12/24/13

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 24.1
(conferences, CE, etc.)

Total Number of clinical hours completed: 168.1
(167 hours required)

Grade in clinical portion of course: Pass ✓ Fail

[redacted] MSN, PhD, RN 12/24/2013

Signature of Seminar Instructor Date

NPST Student Tracking System - Sub-Administration Section
TIME LOGS
BY STUDENT

Hunter College School of Nursing, CUNY (Acct #7321)

Arnold, Joan is logged in. [redacted]

[redacted]

TIME LOGS

This report shows a particular student's daily time logs, most recent first, formatted in **hours**. Click the [redacted] or [redacted] buttons to lock/unlock time logs for student editing.

FILTERS
Student: [redacted]
Date Range: From To
Course: --All--
Display patient, consult & conference time
Show data as: hours **Show notes** Apply Filters

TIME LOGS FOR: [redacted]

[redacted]

Date	Course	Shift Time	Formal Preceptor Consultation	Time Log for Non-Direct Care Clinical Placements	Time Log for N771 Agency Clinical Hours	Time Log for N771 Non-Agency Clinical Hours	Time Log for Agency Clinical Hours	Time Log for Non-Agency Clinical Hours	Time Log for Webinar Hours	Last Edited
12/22/2013	771-Community/Public Heal...	0	0	0	0	1.5	0	0	0	12/23/2013 1:06:48 AM
12/21/2013	771-Community/Public Heal...	0	0	0	0	1.5	0	0	0	12/23/2013 1:06:13 AM
12/20/2013	771-Community/Public Heal...	0	0	0	0	1.5	0	0	0	12/23/2013 1:05:46 AM
12/18/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	12/20/2013 2:06:00 AM
12/17/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	12/20/2013 2:05:38 AM
12/16/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	12/20/2013 2:05:18 AM
12/10/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	12/20/2013 2:04:38 AM
12/9/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	12/20/2013 2:04:22 AM
11/26/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	12/1/2013 12:35:44 AM
11/25/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	12/1/2013 12:35:05 AM
11/22/2013	771-Community/Public Heal.	0	0	0	8	0	0	0	0	11/24/2013 1:51:12 AM
11/20/2013	771-Community/Public Heal.	0	0	0	8	0	0	0	0	11/20/2013 5:18:39 PM
11/12/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	11/18/2013 8:00:50 AM
11/11/2013	771-Community/Public Heal.	0	0	0	8	0	0	0	0	11/18/2013 8:00:30 AM
11/5/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	11/8/2013 8:37:19 AM
11/4/2013	771-Community/Public Heal.	0	0	0	8	0	0	0	0	11/11/2013 9:30:12 PM
10/29/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	11/2/2013 12:52:41 PM
10/22/2013	771-Community/Public Heal.	0	0	0	8	0	0	0	0	10/27/2013 9:51:42 PM
10/17/2013	771-Community/Public Heal.	0	0	0	8	0	0	0	0	10/28/2013 2:47:27 PM
10/15/2013	771-Community/Public Heal.	0	0	0	8	0	0	0	0	10/21/2013 5:03:08 AM
10/11/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	10/21/2013 2:07:58 AM
10/7/2013	771-Community/Public Heal...	0	0	0	0	2	0	0	0	10/7/2013 10:20:48 PM
10/3/2013	771-Community/Public Heal...	0	0	0	0	8	0	0	0	10/7/2013 12:25:42 AM
9/30/2013	771-Community/Public Heal...	0	0	0	0	8	0	0	0	10/6/2013 11:09:10 PM
9/29/2013	771-Community/Public Heal...	0	0	0	0	1.6	0	0	0	12/1/2013 12:48:45 AM
Date	Course	Shift Time	Formal Preceptor Consultation	Time Log for Non-Direct Care Clinical	Time Log for N771 Agency	Time Log for N771 Non-Agency	Time Log for Agency Clinical	Time Log for Non-Agency	Time Log for Webinar	Last Edited

				Placements	Clinical Hours	Clinical Hours	Hours	Clinical Hours	Hours	
Totals		0	0	0	144	24.1	0	0	0	

Report generated 12/28/2013 5:38:46 PM ET

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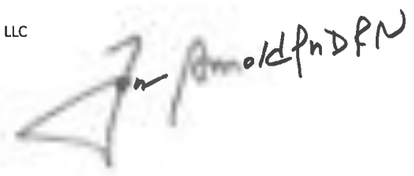

HEALTH POLICY AND MANAGEMENT
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: Mina Fasolo

Name of Agency: NYC Department of Health and Mental Hygiene, Division of Mental Hygiene, Bureau of Children, Youth, and Families, Office of Policy and Planning Dates of Placement: 7/8/13 To: 9/6/13

Please check one box in each row

	Excellent (Performs on a Level that is Professional)	**Above Average**	**Average** (Needs to Improve)	**Below Average**	No Opportunity To Observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works	X				
b) Principles and concepts related to policy development		X			
c) Concepts and procedures related to management					X
2. Skills in:					
a) Assessment					X
b) Evaluation		X			
c) Budgetary processes					X
d) Policy implementation		X			
e) Writing		X			
f) Oral communication	X				
g) Collaborative team work	X				
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers	X				
2. Organizes and uses time effectively	X				
3. Listens attentively		X			
4. Facilitates work of program	X				
5. Submits accurate, well documented work and reports	X				
6. Accepts responsibility and completes work assignments	X				
7. Shows creativity or innovativeness	X				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:

   Daniel was a pleasure to work with. He demonstrated a professional and collegial presence within our office, a very good understanding of our topic areas, and excellent critical thinking skills. Daniel showed strong self-motivation when given tasks that were new to him, and took initiative to research information to raise his level of understanding when needed.

2. Skills and knowledge needing further improvement:

3. Other comments:

Preceptor's Signature Mina Fasolo **Date** 10/17/13

You are encouraged to discuss this evaluation with the student.

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date 12/18/13

Semester: Fall 2013

Name of Preceptor: [illegible]

Agency/Organization: [illegible]

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	9
2.	Motivation	10
3.	Self-directed resourcefulness	9
4.	Value of the contributions to the Agency	9
5.	Reliability/adherence to promised schedules	10
6.	Interpersonal skills	10
7.	Overall rating	10

Total number of Agency clinical hours completed: 104

Preceptor's comments on particular areas of student growth and performance:

[redacted] has been a welcomed asset to the team. Her enthusiasm to the work has been instrumental in helping to get key projects off the ground. I look forward to seeing as she becomes more involved in her projects.

Signature of Agency Preceptor — Date 12/18/13

Student Comments:

[redacted]

Signature of Student — Date 12/16/13

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 3 (conferences, CE, etc.)

Total Number of clinical hours completed: 167 (167 hours required)

Grade in clinical portion of course: Pass ✓ Fail ____

Signature of Seminar Instructor — Date 1/07/2014

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: December 20, 2013

Semester: Fall 2013

Name of Preceptor: Sarah Marshall

Agency/Organization: Downstate Medical Center (SUNY)

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	10
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	10
6.	Interpersonal skills	10
7.	Overall rating	10

Total number of Agency clinical hours completed 145.9

Preceptor's comments on particular areas of student growth and performance

[redacted] vastly expanded her knowledge of Breastfeeding practices, policies and procedures which includes Baby Friendly Hospital Initiative (BFHI): appropriate latch-on, positioning; cues; hand expression recommendation for exclusive breastfeeding for six months and interviewing. She also supervised undergraduate nursing students and delegation of assignments. She showed initiative as was demonstrated through patients/clients teaching without close supervision.

[redacted] conducted research literature review about the impact of prenatal Breastfeeding Education on breastfeeding outcomes in preparation for writing a grant proposal.

Laurel L. Maulucci 12/20/13

Signature of Agency Preceptor Date

Student Comments

This clinical offered a wide range of learning experiences that allowed for me to refine some of my existing skills and to acquire and advance on Public Health Nursing skills and outlook.

[redacted] 12/20/13

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 16.5 (5.5 hours of personal preceptor consultation)

(conferences, CE, etc.)

Total Number of clinical hours completed: 167.9

(167 hours required)

Grade in clinical portion of course: Pass ✓ Fail _____

M Moore 1/17/2014

Signature of Seminar Instructor Date

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: December 2013

Semester: Fall Semester 2013

Name of Preceptor: Dr. ~~Chaur~~ Charu J. Sabharwal, Medical Director Epidemiology and Field Services Program
New York City Department of Health and Mental Hygiene

Agency/Organization: Bureau of HIV/AIDS Prevention and Control

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	10
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	10
6.	Interpersonal skills	10
7.	Overall rating	10

Total number of Agency clinical hours completed: 167 hours

Preceptor's comments on particular areas of student growth and performance:

[redacted] is a thoughtful, hardworking student who is committed to any task I give her. We have spent this first semester together reviewing & discussing the HIV/AIDS epidemic as it relates to the NYC HIV surveillance system. [redacted] is participating in a new, exciting time in our Bureau as we are now legally able to provide HIV surv data at both the facility and individual level [redacted] first assisted with gathering clinical info on 40+ sites we will be providing facility-level data in 2014. She contacted every site and remained

Chandrakala Sabhaiwal 12/20/2013

Signature of Agency Preceptor Date

Student Comments: → polite, professional and courteous even when not shown the same level of professionalism she has helped to make great headway on this needed contact info. No matter the task [redacted] shows great enthusiasm

[redacted] 12/20/13

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: —
(conferences, CE, etc.)

Total Number of clinical hours completed: 167
(167 hours required)

Grade in clinical portion of course: Pass _____ Fail _____

Jo Arnold PhD, RN 12/20/2013

Signature of Seminar Instructor Date

Typhon Group Healthcare Solutions

NPST Student Tracking System - Data Entry Section
TIME LOGS

Hunter College School of Nursing, CUNY (Acct #7321) [redacted] is logged in. Log Out

Go To Main Menu

Time log has been added.

TIME LOGS

This report shows your daily time logs, most recent first, formatted in **hours**. Optionally, you can add filters to the report.

FILTERS

Date Range: From To

Course: --All--

Display patient, consult & conference time

Show data as: hours **Show notes** Apply Filters

[redacted]

Add a Daily Time Log

View/Export Results to Excel

Date	Course	Shift Time	Formal Preceptor Consultation	Time Log for Non-Direct Care Clinical Placements	Time Log for N771 Agency Clinical Hours	Time Log for N771 Non-Agency Clinical Hours	Time Log for Agency Clinical Hours	Time Log for Non-Agency Clinical Hours	Time Log for Webinar Hours
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
12/9/2013	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	0	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	5.5	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	7	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	7	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	7	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	0	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	5.5	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
11/15/2013	771-Community/Public Heal...	0	0	0	0	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	7	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	0	0	0	0	0
[redacted]3	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	0	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	7	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0
[redacted]	771-Community/Public Heal...	0	0	0	6	0	0	0	0

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Rupa	Sup Last Name:	Mehta
Organization:	NaliniKIDS		

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Excellent
Developing health objectives	Excellent
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	Excellent
Applying research methodologies	Excellent
Compiling health data/statistics	N/A
Facilitating group process	Excellent

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	E is a dedicated self-starter, intelligent, honest and exceptionally ambitious. These attributes combined with her vibrancy make her extremely professional and a very capable and valuable team member and leader. Her background and passion for education, finance, and public health have all directly led to efficiently and effectively scaling the NaliniKIDS program. Her creativity, patience, organizational skills, confidence, and strong and clear communication skills have allowed her the ability to control and handle various dynamics and be an effective strategist and leader. Her natural talents and abilities are admirable and combined with her education and expertise has highly contributed to our successful progress.
What are the areas needing improvement?	To be honest, none. She has an uncanny ability to take a potential weakness, self-correct it and make it her greatest strength.
Other comments regarding the intern:	

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Alla	Sup Last Name:	Lerner, LCSW

Organization:	Elderplan, Metropolitan Jewish Health System

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	N/A
Supervisor	Excellent
Personnel from other organizations	N/A
Clientele	Excellent
General public	N/A

D) Application of community Health Skills

Assessing health problems	Excellent
Developing health objectives	Excellent
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	L has demonstrated thoughtfulness, consistency and phenomenal work ethic; she has shown a remarkable effort to learn the nuances of the managed care industry and be of assistance to the members. L is a professional with deep sense of responsibility, ownership and integrity.
What are the areas needing improvement?	N/A Areas of improvement were not elicited - L is a seasoned professional seeking further growth.
Other comments regarding the intern:	I have greatly enjoyed working with L and being a part of her training.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Leonardo	Sup Last Name:	Vicente

Organization:	HELP/PSI, INC.

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Excellent
Developing health objectives	Excellent
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	Excellent
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	Excellent

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	R is thorough and efficient. He has excellent communication skills and is a very motivated individual.
What are the areas needing improvement?	R is a well rounded individual and I am not aware of any visible flaw.
Other comments regarding the intern:	R has a very diverse background. He will be able to acclimate to different environments and be able to flourish.. He thinks well on his feet and communicates effectively.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Sarita	Sup Last Name:	Dhuper

Organization:	Live Light Live Right at Brookdale University Hospital

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Good
Uses time effectively	Good
Reliably completes tasks on time	Good
Effectiveness in written communication	Good
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Very good
Overall quality or work produced	Very good

B) Work Attitudes

Accepts responsibilities	Very good
Takes initiative	Good
Follows policies, rules, regulations, etc.	Very good
Graciously accepts ideas and suggestions	Very good
Perfoms tasks with industry and drive	Good

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Very good
Support staff	Very good
Supervisor	Very good
Personnel from other organizations	Very good
Clientele	Very good
General public	Very good

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	Very good
Planning health programs/projects	Good
Implementing programs/projects	Very good
Evaluating programs/projects	Good
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	Fair
Facilitating group process	Good

E) Personal Characteristics

Dependability	Good
Tactfulness	Good
Listening ability	Good
Sensitivity	Good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Good
What are the outstanding strengths of the intern?	S was motivated to learn and grow. Health care is new to her so she needed time learning to navigate the system and prioritize. She has great communication skills, a quick learner, wants to take on a diverse role and is ambitious. She questions and has great suggestions.
What are the areas needing improvement?	Needs to be able to follow through on projects more independently and aggressively. In public health and administration you have to learn how to be persistent to get things done. She can also be more innovative and come up with her own ideas and write ups. Organization skills when dealing with a variety of different groups and organizations could be improved over time in a real working environment out of the classroom.
Other comments regarding the intern:	Great potential. Works well in a team. Pleasant and easy to relate to . Culturally sensitive and interacts well with patients and families. I would like to see her focus more on self initiative and growth she is capable of. She could also focus on reviewing the literature and reading more on her projects at hand.

Future Opportunities

Would you be willing to take another student next semester?	Yes

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: December 2013

Semester: Fall Semester 2013

Name of Preceptor: Coleen Cox-Ballah, Manager

Agency/Organization: Centers of Excellence, Visiting Nurse Service of New York

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	10
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	8
6.	Interpersonal skills	10
7.	Overall rating	50

Total number of Agency clinical hours completed: 160 / total = 168

Preceptor's comments on particular areas of student growth and performance:

Received on 12/19/2013 2:46:02 PM

Alan Cox-Ballard 12.19.13

Signature of Agency Preceptor Date

Student Comments: I gained tremendously during the clinical seminar for this semester, fall 2013. In this clinical seminar, I am able to use data collection to evaluate the practice environment and quality of nursing care rendered in relation to existing evidence. I have been able to assess, evaluate and provide comments on data reviews that are part of the important projects that I am privilege to work on along with the supervision of my preceptor. I learned how projects are being developed to promote and enhance better client's outcomes at VNSNY. I hope to continue to develop in future clinical seminar at the agency.

[redacted]

Signature of Student Date: 12/19/13

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 8
(conferences, CE, etc.)

Total Number of clinical hours completed: 168
(167 hours required)

Received on 12/19/2013 2:46:02 PM

Grade in clinical portion of course: Pass ✓ Fail _____

Signature of Seminar Instructor Jan Arnold, MD, RN Date 12/20/2013

Received on 12/19/2013 2:46:02 PM

TyphonGroup Healthcare Solutions

NPST Student Tracking System - Data Entry Section
TIME LOGS

Hunter College School of Nursing, CUNY (Acct #7321) [redacted] logged in. Log Out

Go To Main Menu

TIME LOGS

This report shows your daily time logs, most recent first, formatted in **hours**. Optionally, you can add filters to the report.

FILTERS

Date Range: From [ ] To [ ]

Course: -All-

Display patient, consult & conference time

Show data as: hours **Show notes** Apply Filters

Add a Daily Time Log | View/Export Results to Excel

Date	Course	Shift Time	Formal Preceptor Consultation	Time Log for Non-Direct Care Clinical Placements	Time Log for N771 Agency Clinical Hours	Time Log for N771 Non-Agency Clinical Hours	Time Log for Agency Clinical Hours	Time Log for Non-Agency Clinical Hours	Time Log for Webinar Hours
12/17/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0
12/11/2013	771-Community/Public Heal...	0	0	0	24	0	0	0	0
12/4/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0
11/29/2013	771-Community/Public Heal...	0	0	0	16	0	0	0	0
11/22/2013	771-Community/Public Heal...	0	0	0	16	0	0	0	0
11/14/2013	771-Community/Public Heal...	0	0	0	0	8	0	0	0
11/13/2013	771-Community/Public Heal...	0	0	0	16	0	0	0	0
11/5/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0
10/31/2013	771-Community/Public Heal...	0	0	0	16	0	0	0	0
10/22/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0
10/18/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0
10/8/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0

10/4/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0
10/3/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0
9/24/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0
Date	**Course**	**Shift Time**	**Formal Preceptor Consultation**	**Time Log for Non-Direct Care Clinical Placements**	**Time Log for N771 Agency Clinical Hours**	**Time Log for N771 Non-Agency Clinical Hours**	**Time Log for Agency Clinical Hours**	**Time Log for Non-Agency Clinical Hours**	**Time Log for Webinar Hours**
Totals		**0**	**0**	**0**	**160**	**8**	**0**	**0**	**0**

Report generated 12/19/2013 3:01:17 PM ET

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TyphonGroup Healthcare Solutions

NPST Student Tracking System - Sub-Administration Section
TIME LOGS
BY STUDENT

Hunter College School of Nursing, CUNY (Acct #7321)

Arnold, Joan is logged in. Log Out

Go to Main Menu

TIME LOGS

This report shows a particular student's daily time logs, most recent first, formatted in **hours**. Click the or buttons to lock/unlock time logs for student editing.

FILTERS

Student: [redacted]

Date Range: From To

Course: --All--

Display patient, consult & conference time

Show data as: hours **Show notes** Apply Filters

TIME LOGS FOR: [redacted]

View/Export Results to Excel

Date	Course	Shift Time	Formal Preceptor Consultation	Time Log for Non-Direct Care Clinical Placements	Time Log for N771 Agency Clinical Hours	Time Log for N771 Non-Agency Clinical Hours	Time Log for Agency Clinical Hours	Time Log for Non-Agency Clinical Hours	Time Log for Webinar Hours	Last Edited
12/17/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	12/17/2013 9:45:00 PM
12/11/2013	771-Community/Public Heal..	0	0	0	24	0	0	0	0	12/14/2013 12:27:57 AM
12/4/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	12/7/2013 1:49:50 AM
11/29/2013	771-Community/Public Heal...	0	0	0	16	0	0	0	0	11/30/2013 1:20:35 PM
11/22/2013	771-Community/Public Heal...	0	0	0	16	0	0	0	0	11/23/2013 8:44:28 PM
11/14/2013	771-Community/Public Heal...	0	0	0	0	8	0	0	0	11/15/2013 11:44:16 PM
11/13/2013	771-Community/Public Heal...	0	0	0	16	0	0	0	0	11/15/2013 9:35:27 PM
11/5/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	11/8/2013 6:07:41 PM
10/31/2013	771-Community/Public Heal...	0	0	0	16	0	0	0	0	11/3/2013 8:24:36 AM
10/22/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	10/27/2013 11:16:35 AM
10/18/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	10/18/2013 10:55:25 PM
10/8/2013	771-Community/Public Heal...	0	0	0	8	0	0	0	0	10/12/2013 12:26:53 AM
10/4/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	10/4/2013 11:57:55 PM
10/3/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	11/15/2013 11:46:51 PM
9/24/2013	771-Community/Public Heal..	0	0	0	8	0	0	0	0	9/28/2013 1:21:01 PM
Date	**Course**	**Shift Time**	**Formal Preceptor Consultation**	**Time Log for Non-Direct Care Clinical Placements**	**Time Log for N771 Agency Clinical Hours**	**Time Log for N771 Non-Agency Clinical Hours**	**Time Log for Agency Clinical Hours**	**Time Log for Non-Agency Clinical Hours**	**Time Log for Webinar Hours**	**Last Edited**
Totals		**0**	**0**	**0**	**160**	**8**	**0**	**0**	**0**	

Report generated 12/28/2013 5:39:58 PM ET

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HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 12/10/13

Semester: Fall 2013

Name of Preceptor: Ana Marin

Agency/Organization: New York Presbyterian Hospital Center for Community Health and Education

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	08
4.	Value of the contributions to the Agency	09
5.	Reliability/adherence to promised schedules	08
6.	Interpersonal skills	10
7.	Overall rating	09

Total number of Agency clinical hours completed: 142 hrs.

Preceptor's comments on particular areas of student growth and performance:

It has been a pleasure having [redacted] on our clinic. She has great energy and is motivated. [redacted] began the semester feeling shy and hesitant to figure out how to communicate her ideas. However by October this had quickly changed. [redacted] became comfortable in engaging students without my presence and expressing her thoughts and these interactions. We worked together to formalize a plan towards which schools to target and I appreciated the initiative she took in sending emails, replying and setting up meetings. I know [redacted] wants to fine tune her public speaking skills and I have no doubt this is something that she will improve next semester. As I mentioned to her just today - I have been very impress with her desire to lead particular sections of the workshops despite feeling nervous. I look forward to working with [redacted] next semester!

Ana Marie — 12/10/13

Signature of Agency Preceptor — Date

Student Comments:

[redacted] — 12/10/13

Signature of Student — Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: _____ (conferences, CE, etc.)

Total Number of clinical hours completed: _____ (167 hours required)

Grade in clinical portion of course: Pass _____ Fail _____

Signature of Seminar Instructor — Date

PRECEPTOR EVALUATION FORMS

(Note: Each Campus / Specialization within CUNY SPH @ Hunter has a Unique Forms)

PUBLIC HEALTH NUTRITION

Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: Alex Lutz

Name of Agency: American Red Cross Dates of placement: 7/30/18 to 12/30/18

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works	X				
b) Health education principles and concepts	X				
2. Skills in:					
a) Planning	X				
b) Implementation	X				
c) Organizing	X				
d) Program analysis and evaluation	X				
e) Writing	X				
f) Verbal communication	X				
g) Nutrition counseling/education	X				
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.	X				
2. Organizes and uses time effectively.	X				
3. Considers and incorporates the ideas of others	X				
4. Is able to facilitate work of committees and other groups.	X				
5. Submits accurate, well documented work and reports.	X				
6. Accepts responsibility and completes work assignments	X				
7. Raises innovative ideas and brings out creative and innovative ideas in others	X				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: [redacted] has shown a great ability to work independently and multi-task. Her planning concept to create a new children's program for the Greater New York chapter is well thought out and included several components that were not considered by myself when first discussed. She has also gone to great lengths to work with the chapter's volunteer resources department to recruit volunteers to provide input on the first draft concept of the program.
2. Skills and knowledge needing further improvement: None that I have observed.
3. Other comments: [redacted] was tasked with working on a new children's program and went well beyond what was originally discussed or conceived. Her concept impressed our Chief Operations Officer who is a 20 year Red Cross employee and who has overseen children's programs herself. [redacted]'s brilliant thoughtfulness, planning and attention to detail has enabled me to let her work almost completely independent at times and I have used [redacted] as an example to other departments on the tremendous

benefits that come from engaging volunteers to assist in our everyday operations. [redacted] has also taken time to work outside her position and learn more about the Red Cross, for example, going on a ride along with our disaster responders to the scene of a local emergency. [redacted] easy ranks at the top of the class when I consider the interns I have had in my eight years at the Red Cross.

Preceptor Signature _____ **Date:** 12/11/13

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

[redacted]

HEALTH POLICY AND MANAGEMENT
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: Alex Lutz

Name of Agency: American Red Cross Dates of placement: 1/30/13 to _____

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works	X				
b) Health education principles and concepts	X				
2. **Skills in:**					
a) Assessment	X				
b) Evaluation	X				
c) Budgetary processes	X				
d) Policy implementation	X				
e) Writing	X				
f) Oral communication	X				
g) Collaborative team work	X				
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers	X				
2. Organizes and uses time effectively	X				
3. Listens attentively	X				
4. Facilitates work of program	X				
5. Submits accurate, well documented work and reports	X				
6. Accepts responsibility and completes work assignments	X				
7. Shows creativity or innovativeness	X				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: [redacted] has shown a great ability to work independently and multi-task. Her planning concept to create a new children's program for the Greater New York chapter is well thought out and included several components that were not considered by myself when first discussed. She has also gone to great lengths to work with the chapter's volunteer resources department to recruit volunteers to provide input on the first draft concept of the program.
2. Skills and knowledge needing further improvement: None that I have observed.
3. Other comments: Jessica was tasked with working on a new children's program and went well beyond what was originally discussed or conceived. Her concept impressed our Chief Operations Officer who is a 20 year Red Cross employee and who has overseen children's programs herself. [redacted]'s brilliant thoughtfulness, planning and attention to detail has enabled me to let her work almost completely independent at times and I have used [redacted] as an example to other departments on the tremendous benefits that come from engaging volunteers to assist in our everyday operations. [redacted] has also taken time to work outside her position and learn more about the Red Cross, for example, going on a ride along

with our disaster responders to the scene of a local emergency. Jessica easy ranks at the top of the class when I consider the interns I have had in my eight years at the Red Cross.

Preceptor Signature _____ **Date**: 12/11/13

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

HEALTH POLICY AND MANAGEMENT
Fieldwork Preceptor Evaluation Form

Student: [redacted]

Preceptor: Shalini Somayaji

Name of Agency: Sakhi for South Asian Women

Dates of placement: 5/9/13 to 12/1/13

X *Please check one box in each row.*

	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works		X			
b) Health education principles and concepts	X				
2. **Skills in:**					
a) Assessment	X				
b) Evaluation	X				
c) Budgetary processes					X
d) Policy implementation		X			
e) Writing		X			
f) Oral communication	X				
g) Collaborative team work	X				
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers		X			
2. Organizes and uses time effectively	X				
3. Listens attentively	X				
4. Facilitates work of program		X			
5. Submits accurate, well documented work and reports	X				
6. Accepts responsibility and completes work assignments	X				
7. Shows creativity or innovativeness	X				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths [redacted] input in our archived case file review was so valuable – she created a form that we are continuing to use. She also was quite patient and sensitive when reaching out to our constituents, survivors of violence.

2. Skills and knowledge needing further improvement:

3. Other comments:

Preceptor Signature Shalini Somayaji **Date:** 10/29/13

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

HEALTH POLICY AND MANAGEMENT
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: CHRISTINE ESSIG

Name of Agency: NORTH SHORE LIJ HEALTH SYSTEM Dates of Placement: 7/8/13 To PRESENT

	Please check one box in each row				
	Excellent (Performs on a Level that is Professional)	**Above Average**	**Average** (Needs to Improve)	**Below Average**	No Oppotunity To Observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works	✓				
b) Principles and concepts related to policy development					✓
c) Concepts and procedures related to management					
2. Skills in:					
a) Assessment		✓			
b) Evaluation		✓			
c) Budgetary processes					✓
d) Policy implementation					✓
e) Writing		✓			
f) Oral communication	✓				
g) Collaborative team work	✓				
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers		✓			
2. Organizes and uses time effectively		✓			
3. Listens attentively		✓			
4. Facilitates work of program			✓		
5. Submits accurate, well documented work and reports			✓		
6. Accepts responsibility and completes work assignments			✓		
7. Shows creativity or innovativeness			✓		

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:
2. Skills and knowledge needing further improvement:
3. Other comments:

Preceptor's Signature C. Essig **Date:** 10/30/13

You are encouraged to discuss this evaluation with the student.

[redacted] IS A TEAM PLAYER AND HAS BROUGHT VALUE TO THE PROJECT HE IS WORKING ON. HOWEVER, BECAUSE OF HIS OTHER EMPLOYMENT COMMITTMENTS, [redacted] HAS BEEN UNABLE TO MAINTAIN A REGULAR SCHEDULE WITH OUR OFFICE WHICH SOMETIMES HINDERS THE PROGRESS OF THE PROJECT. [redacted] MUST ALSO WORK ON COMMUNICATING WORK CONFLICTS IN A MORE PROFESSIONAL AND TIMELY MANNER.

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Yma	Sup Last Name:	Andries

Organization:	New York City Department of Health and Mental Hygiene

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Very good
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Very good
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	N/A
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	V has been extremely hands-on in every aspect of this project. She has brought up ideas that have been implemented, such as changes to the data collection form. She has made suggestions in terms of how the work can be operationalized and what makes practical sense in the field.
What are the areas needing improvement?	V has really been a pleasure to work with since the inception of the project. She has no problem explaining her point of view and reasoning behind her suggestions. There were no identifiable areas needed for improvement.
Other comments regarding the intern:	V is not only enthusiastic about the project, she has come with well-though out solutions to issues that have come up. She has been vital to the smooth running of the pilot project and her work will help to shape, she has worked well as part of the team, but has also demonstrated the capacity to work individually without constant supervision.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Laura	Sup Last Name:	Campisi

Organization:	Maimonides Medical Center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Very good
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Very good

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Very good
Support staff	Very good
Supervisor	Very good
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	Excellent
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	Very good
Applying research methodologies	Very good
Compiling health data/statistics	Excellent
Facilitating group process	Excellent

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	G is ready to give new ideas and insight from what he has learned in his public health background and is eager to implement them. He is highly dependable and reasons well with others. He has shown to be consistently motivated with his peers and superiors. G takes initiative with the bariatric patient safety project. His knowledge has been an asset to our program.
What are the areas needing improvement?	Overall, G has been an excellent intern with very few areas needing improvement. In the beginning of his internship I realized G had some difficulty balancing work, school, and the internship. Throughout the course of the internship he has developed ways of managing his schedule, to the point where he was able to successfully completed his internship work exceedingly well.
Other comments regarding the intern:	Would make an excellent asset in any organization.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Audrey	Sup Last Name:	Castillo

Organization:	Brooklyn DPHO, NYC DOHMH

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Good
Uses time effectively	Good
Reliably completes tasks on time	Good
Effectiveness in written communication	Good
Effectiveness in oral communication	Good
Ability to identify problems and proposes solutions	Fair
Overall quality or work produced	Good

B) Work Attitudes

Accepts responsibilities	Fair
Takes initiative	Good
Follows policies, rules, regulations, etc.	Good
Graciously accepts ideas and suggestions	Good
Perfoms tasks with industry and drive	Very good

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Good
Support staff	Good
Supervisor	Good
Personnel from other organizations	Good
Clientele	Good
General public	Good

D) Application of community Health Skills

Assessing health problems	Good
Developing health objectives	Good
Planning health programs/projects	Good
Implementing programs/projects	Good
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	N/A
Facilitating group process	Good

E) Personal Characteristics

Dependability	Fair
Tactfulness	Good
Listening ability	Good
Sensitivity	Good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Good
What are the outstanding strengths of the intern?	Ms. T wants to assure that she is on the right track with her work and solicits feedback as much as possible. She follows directions very well and is careful in performing every task as explained. She has taken initiative with one school and applied her own skills by translating their wellness policy to Arabic.
What are the areas needing improvement?	While sometimes she takes initiative, often following directions limits her from thinking outside of the box in terms of what creative solutions she can assist the schools in achieving their wellness goals. While she has been able to manage time with schools well, she has missed a planned meeting with the other interns. Mistakes happen but this would be unacceptable in a work setting.
Other comments regarding the intern:	Ms. T has really given a lot of her time and energy to the program and has been asset to her schools. As she grows as a public health professional, I hope that she trusts her instincts more and takes more initiative to explore the needs of whatever project she is working on and develop solutions.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Vilma	Sup Last Name:	Torres

Organization:	Planned Parenthood of New York City/BHC

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	N/A
Implementing programs/projects	N/A
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	N/A
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	During this past semester E developed many new skills. She was able to engage patients in a short period of time, provide education on pregnancy options and contraception. E was compassionate, actively listened and ensured patients questions were answered. E's major strengths are her diligence, organized and dependability. She communicated with patients in a non judgmental, empathetic and professional manner.
What are the areas needing improvement?	N/A
Other comments regarding the intern:	E did an outstanding job in her role at PPNYC.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Leanne	Sup Last Name:	Luerassi

Organization:	New York University School of Medicine, Department of Population Health

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	N/A
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Very good
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Very good
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Very good
Perfoms tasks with industry and drive	Very good

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Very good
Support staff	Very good
Supervisor	Excellent
Personnel from other organizations	Very good
Clientele	Very good
General public	N/A

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	N/A
Planning health programs/projects	N/A
Implementing programs/projects	Very good
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	Very good
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Very good
Sensitivity	Very good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	L is extremely reliable, personable, and independent. She is a quick learner and has a great rapport with patients and our staff.
What are the areas needing improvement?	If anything, I would say that L could improve her confidence in her in her interactions with patients. Engaging potential participants and completing the lengthy data collection visits can be challenging, but if you are confident in explaining the study and moving through the protocol, it makes everything run smoother. L has the potential to do this very well and I've seen improvement from when she first started to now.
Other comments regarding the intern:	None.

Future Opportunities

Would you be willing to take another student next semester?	Yes

ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCE
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: David Olton

Name of Agency: NYC DEP Dates of Placement: 09/30/14 To 12/19/14

Please check one box in each row.

	Excellent (Performs on a Level that is Professional)	**Above Average**	**Average** (Needs to Improve)	**Below Average**	No Opportunity To Observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works			X		
b) Principles and concepts related to policy development			X		
c) Concepts and procedures related to management			X		
2. **Skills in:**					
a) Assessment		X			
b) Evaluation		X			
c) Budgetary processes					X
d) Policy implementation					X
e) Writing		X			
f) Oral communication		X			
g) Collaborative team work		X			
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers		X			
2. Organizes and uses time effectively		X			
3. Listens attentively	X				
4. Facilitates work of program		X			
5. Submits accurate, well documented work and reports		X			
6. Accepts responsibility and completes work assignments		X			
7. Shows creativity or innovativeness		X			

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. **Special strengths:** Accountability, Multi-tasking, Commitment, Motivation
2. **Skills and knowledge needing further improvement:** Interpersonal skills, Teamwork and Collaboration skills, Communication skills (verbal, non-verbal, and written), Time Management Skills, Results Orientation Skills
3. **Other comments:** Please see below.

[redacted] is a versatile and highly motivated individual who has demonstrated a sincere willingness to assist the Office of Environmental Health and Safety's (EHS), EHS Management Systems Division (EHSMSD) complete our immediate tasks/projects to ensure fulfillment of our Division's long-term goal to measure and demand EHS success at the NYCDEP. As a result of [redacted]'s demonstrated commitment to assist EHSMSD, she successfully assisted EHSMSD in developing a comprehensive electronic document library of historical EHS Audit and Assessment reports (issued by our EHSMSD Audit Team from 2003 – 2014). Developing a document library was part of an overall *EHS Assessment Scheduling Initiative* formed to assist EHSMSD develop Annual EHS Assessment Schedules for the 2015 calendar year and onwards. The results of [redacted]'s efforts will also further enable EHSMSD to introduce a breakthrough online Microsoft SharePoint Document Library that will be easily accessible to all Agency EHS staff, and will be utilized as a primary website to obtain information for future EHS assessment planning initiatives. [redacted] also participated in the compilation and presentation of EHS post-assessment survey results to assist EHSMSD in reviewing trends and feedback received from our Bureau peers to continually improve our Audit Program. She also assisted in reconciling performance metrics data (i.e. review of injuries and illness logs, notices of violations, and motor vehicle collision reports) to finalize our Fiscal Year 2015 1st Quarter Agency EHS Performance Report.

Future Performance Planning:

[redacted] exhibits good listening skills, comprehends complex EHS subject matters well, and is willing to complete her assignments under strict deadlines. With opportunities for continued exposure to a professional work environment, it is anticipated that [redacted] will continue to strengthen her technical and management level skills for continued success in her future career endeavors.

Preceptor's Signature _____ **Date:** 12/19/14

You are encouraged to discuss this evaluation with the student.

Preceptor's Evaluation Form
Hunter College Environmental and Occupational Health Sciences Program
CUNY School of Public Health

Student: [redacted]
Name of Organization: CUNY Hunter

Site Supervisor: Dr. Jack Caravanos
Dates of placement: 04/01/14 -12/06/14

	Please check one box in each row.				
	Excellent (performs on highly professional level)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of: a) Technical & political climate within which organization works	X				
b) Environmental and occupational health principles and concepts	X				
c) Legal and regulatory environment	X				
2. Skills in: a) Planning		X			
b) Implementation	X				
c) Exposure assessment	X				
d) Program analysis and evaluation		X			
e) Written communication	X				
f) Verbal communication	X				
g) Data evaluation and analysis	X				
h) Training and education	X				
i) Hazard evaluation and abatement	X				
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers	X				
2. Organizes and uses time effectively	X				
3. Considers and incorporates the ideas of others		X			
4. Is able to facilitate work of committees and other groups	X				
5. Submits accurate, well documented work and reports	X				
6. Accepts responsibility and completes work assignments	X				
7. Raises innovative ideas and brings out creative and innovative ideas in others		X			

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: very strong student. strong skills in skin

2. Skills and knowledge needing further improvement:

3. Other comments:

Site Supervisor's Signature [signature] **Date:** 4/13/2015

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

[redacted]

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Wayne	Sup Last Name:	Gietz

Organization:	Brookdale Hospital Medical Center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Very good
Reliably completes tasks on time	Very good
Effectiveness in written communication	Very good
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Very good
Takes initiative	Very good
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Very good
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	Very good
Planning health programs/projects	Very good
Implementing programs/projects	Very good
Evaluating programs/projects	Very good
Developing budgets	Very good
Applying research methodologies	Very good
Compiling health data/statistics	Very good
Facilitating group process	Excellent

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	Ms. D is a very thoughtful and well rounded leader.
What are the areas needing improvement?	Ms. D needs to continue to develop her understanding of healthcare delivery systems.
Other comments regarding the intern:	Ms. D is a complete pleasure to work with.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EPIDEMIOLOGY/BIOSTATISTICS
Fieldwork Preceptor Evaluation Form

Student: [redacted] Site Supervisor: Levi Waldron

Name of Agency: CUNY School of Public Health, Hunter College Dates of placement: Sept 2014 – May 2015

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works		X			
b) Public health principles and concepts		X			
2. Skills in:					
a) Planning				X	
b) Implementation			X		
c) Organizing			X		
d) Program analysis and evaluation					X
e) Writing			X		
f) Verbal communication			X		
g) Data manipulation/analysis			X		
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.		X			
2. Organizes and uses time effectively.				X	
3. Considers and incorporates the ideas of others		X			
4. Is able to facilitate work of committees and other groups.					X
5. Submits accurate, well documented work and reports.		X			
6. Accepts responsibility and completes work assignments				X	
7. Raises innovative ideas and brings out creative and innovative ideas in others			X		

COMMENTS (Please respond briefly. Use reverse side if necessary):

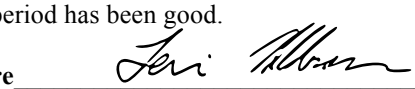
1. Special strengths: Final results are well-organized and readable.

2. Skills and knowledge needing further improvement:

Ability to meet deadlines and agreed-upon milestones needs work. The final fieldwork output is significantly less, and took much longer, than originally anticipated.

3. Other comments:

Work responsibilities have limited Jasmine's ability to fully participate in fieldwork, but the quality of what she was able to produce during the period has been good.

Site Supervisor's Signature  _____ **Date**: May 26, 2015

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Brooke	Sup Last Name:	Barber

Organization:	Brookdale Hospital

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	N/A
Supervisor	Excellent
Personnel from other organizations	N/A
Clientele	N/A
General public	N/A

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	Excellent
Implementing programs/projects	N/A
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	Ms. G is excellent at managing her time, and completing tasks with extreme effectiveness. Her strengths include her communication skills, and her ability to pull clinical and administrative data from different statistical reports. She also displays professionalism, and a drive to learn.
What are the areas needing improvement?	Ms. G can improve on following up with other entities within the hospital, since they give extreme push back when it comes to completing tasks.
Other comments regarding the intern:	She was able to complete a semesters workload within a couple of months, and I was extremely impressed with the finish product. Her work has really helped me with my program within the hospital, and her extent of knowledge in research has also helped the program immensely.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Leonardo	Sup Last Name:	Cambar

Organization:	CAMBA INC.

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Excellent
Developing health objectives	Very good
Planning health programs/projects	Very good
Implementing programs/projects	Very good
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	Very good
Compiling health data/statistics	Excellent
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	During her internship Ms. K was assigned to a variety of community engagements that she approached with professionalism and enthusiasm. She gained knowledge about HIV/STD to effectively answer questions when asked. She was always on time and delivered her paper work as requested. She also served and filed program documents, and assisted with some clerical duties. Ms. K proved to be an effective, highly conscientious and eager intern. She had no difficulty in adapting and was culturally competent regarding the population that our Condom Distribution Program targeted: people at high risk for HIV and STIs. She was very capable of working independently, seeking directions when necessary. One of Ms. K biggest strengths was that she made a greater effort to make sure that programs goals were a
What are the areas needing improvement?	I hope she continues taking on gradual initiative roles that I believe will prepare her for a management position in the future. Also, she should strive to constantly improve by keeping herself informed and gaining knowledge, as Public Health is a changing field with new findings and different approaches to improve the health and quality of life of communities in need.
Other comments regarding the intern:	Ms. K became an important member of our HIV/STI prevention team with her willingness to learn and dedication to help the Program success in its very important goals: to raise the profile of the DOH NYC condom initiative and raise awareness in the acceptance of condoms in the communities more affected by HIV/STIs in Brooklyn. Ms. K can be a key member to any team where she is assigned to.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Leonardo	Sup Last Name:	Cambar

Organization:	CAMBA INC

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Excellent
Developing health objectives	Excellent
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	Mrs. K has been an excellent addition to CAMBA's Community initiative. Since the very beginning Mrs. K has showed great interest in the program and in the community that our program serves. Mrs. K has worked hard by no only visiting our non traditional sites but she has been a key component in the preparation of our Condom Distribution program documentation. Mrs. K has always accepted the program's challenges very gracious and a professional way, always looking for a solution. Mrs. K was assigned to a task that was new to the program a " Quality Assurance Survey" to be administer to our Non-Traditional-Sites (NTS) She responded w and accepted the new challenge.
What are the areas needing improvement?	Mrs. K, should keep herself focus in overcome cultural and languages barriers. However, she has done it in a very professional way. I am please to report that Mrs. K push herself to excel and that she will always will find areas to improve because she wants to learn.
Other comments regarding the intern:	Mrs. K has been an important member of our HIV/STI prevention team with her willingness and dedication to help the Program success. Mrs. K will be a great asset to any assignment/ task or program because she put her mind into it, focus in the goals and has a determination that any team will appreciate . Mrs. K is a fast learner and her curiosity and tenancy will be her biggest strength once she is in th Public Health field.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Denise	Sup Last Name:	Goodman

Organization:	Memorial Sloan Kettering Cancer Center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	N/A
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Very good
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Good
Overall quality or work produced	Very good

B) Work Attitudes

Accepts responsibilities	Very good
Takes initiative	Very good
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	N/A
Support staff	N/A
Supervisor	Excellent
Personnel from other organizations	N/A
Clientele	N/A
General public	N/A

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	N/A
Implementing programs/projects	N/A
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	Excellent
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Very good
What are the outstanding strengths of the intern?	Initiative and follow through
What are the areas needing improvement?	Greater understanding of program planning and community engagement
Other comments regarding the intern:	E is a great learner, eager to listen and take action. As she advances in her knowledge and experience, these attributes will serve her very well.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Emelin	Sup Last Name:	Martinez

Organization:	NewYork-Presbyterian Hospital Columbia University Medical Center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Very good
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	N/A
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	N/A
Clientele	N/A
General public	Very good

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	Very good
Planning health programs/projects	Excellent
Implementing programs/projects	N/A
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	Very good
Compiling health data/statistics	Very good
Facilitating group process	Very good

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	K is fully committed to what she sets out to accomplish as she has surpassed our expectations in such a short. Furthermore, she has made a positive impression on our Community Pediatrics Director. She excels in the following areas: Responsibility- She consistently reports to work on time. She submits her work in a timely and diligent manner. Personable and Professional-She exhibits strong interpersonal skills as she relates with her peers, hospital staff, patients and hospital leaders. Innovative-She thoroughly examines challenges and offers tangible solutions that are also innovative.
What are the areas needing improvement?	None that I have noted as of yet.
Other comments regarding the intern:	Despite the fact that K has had personal hardship, she has fulfilled her responsibilities in a dedicated and professional manner. I am confident that she will excel in the field of public health.

Future Opportunities

Would you be willing to take another student next semester?	Yes

Environmental and Occupational Health Science
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: Jessica Barcellona

Name of Agency: NYC DOHMH Dates of Placement: 9/2/14 To 12/16/14

	Excellent (Performs on a Level that is Professional)	Above Average	Average (Needs to Improve)	Below Average	No Opportunity To Observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works	X				
b) Principles and concepts related to policy development	X				
c) Concepts and procedures related to management	X				
2. **Skills in:**					
a) Assessment	X				
b) Evaluation	X				
c) Budgetary processes					X
d) Policy implementation	X				
e) Writing	X				
f) Oral communication	X				
g) Collaborative team work	X				
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers	X				
2. Organizes and uses time effectively	X				
3. Listens attentively	X				
4. Facilitates work of program	X				
5. Submits accurate, well documented work and reports		X			
6. Accepts responsibility and completes work assignments	X				
7. Shows creativity or innovativeness	X				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: This fall, DOHMH Incident Command System was activated to respond to the Ebola crisis. [redacted] was tasked with a variety of projects including gathering data about travelers returning from affected countries in Africa who are being monitored for Ebola symptoms and preparing reports that go to City Hall and NYPD. He completed his assignments quickly and accurately. [redacted] performed extremely well during the activation, where priorities are constantly changing and working quickly and efficiently is key.
2. Skills and knowledge needing further improvement: Overall [redacted] is very attentive and submits accurate work but he could improve on his attention to detail to his work.
3. Other comments: [redacted] work performance is very professional and he fits in with the staff extremely well. We are so fortunate to have [redacted] as part of our team.

Preceptor's Signature [signature] **Date:** 12/22/14

You are encouraged to discuss this evaluation with the student.

ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCE
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: F. BELGRAN

Name of Agency: NYCDOHMH - BFSC-S Dates of Placement: _____ To _____

Please check one box in each row.

	Excellent (Performs on a Level that is Professional)	Above Average	Average (Needs to Improve)	Below Average	No Opportunity To Observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works		✓			
b) Principles and concepts related to policy development		✓			
c) Concepts and procedures related to management			✓		
2. Skills in:					
a) Assessment	✓				
b) Evaluation	✓				
c) Budgetary processes		✓			
d) Policy implementation		✓			
e) Writing		✓			
f) Oral communication		✓			
g) Collaborative team work	✓				
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers	✓				
2. Organizes and uses time effectively	✓				
3. Listens attentively		✓			
4. Facilitates work of program	✓				
5. Submits accurate, well documented work and reports	✓				
6. Accepts responsibility and completes work assignments		✓			
7. Shows creativity or innovativeness	✓				

COMMENTS (Please respond briefly. Use reverse side if necessary):
1. Special strengths:
2. Skills and knowledge needing further improvement:
3. Other comments:

Preceptor's Signature [signature] **Date:** 12/9/18

You are encouraged to discuss this evaluation with the student.

[redacted] is a hardworking employee with a tendency to misunderstood since he usually is vocal with his opinion and would always try to make adjustments to fit his needs.

ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCE
Fieldwork Preceptor Evaluation Form

Student: [redacted] **Preceptor**: SYLVIE ADAM

Name of Agency: CENTRAL PARK CONSERVANCY **Dates of Placement**: JUNE 9 to AUGUST 27, 2014

	Please check one box in each row.				
	Excellent (Performs on a Level that is Professional)	**Above Average**	**Average** (Needs to Improve)	**Below Average**	No Opportunity To Observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works					X
b) Principles and concepts related to policy development					X
c) Concepts and procedures related to management					X
2. **Skills in:**					
a) Assessment			X		
b) Evaluation			X		
c) Budgetary processes					X
d) Policy implementation					X
e) Writing			X		
f) Oral communication			X		
g) Collaborative team work			X		
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers		X			
2. Organizes and uses time effectively			X		
3. Listens attentively			X		
4. Facilitates work of program			X		
5. Submits accurate, well documented work and reports		X			
6. Accepts responsibility and completes work assignments			X		
7. Shows creativity or innovativeness			X		

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. **Special strengths:**
   - [redacted] did a good job rehearsing the Hazcom training and practicing the respirator fit test procedure several times in order to gain confidence before presenting to Park employees.
   - [redacted] completed a thorough update of the chemical inventory by visiting all buildings and rooms in the park.
   - [redacted] was open to receiving feedback, and acted on suggestions made by the EH&S Director and EH&S Specialist.
   - [redacted] demonstrated patience and professionalism, and was well liked by the Park staff she encountered.

2. **Skills and knowledge needing further improvement**:
   - Notes and documentation [redacted] would benefit from taking more notes during meetings and documenting her work instead of relying on memory which, for example, led her to report to the wrong location on 6/25/14 to meet the EH&S Director costing her a one hour delay.
   - [redacted] could take more initiative to advance projects. For example, one main topic of her internship involved the Hazcom/GHS program and its requirements. During her inventory work, [redacted] identified 35 containers with missing or faded labels, but she did not incorporate in her schedule a task to address those containers by adding or updating those labels. Correcting such a deficiency on the spot or shortly after discovery would have greatly improved the program.
   - Interns should strive to take advantage of as many learning opportunities as possible. [redacted] declined participation in an interesting noise survey at 7 AM on 8/27/14, but did not explain why.

3. **Other comments**:
   - **Punctuality**:
     [redacted] was punctual with the exception of a notable occasion on 8/26/14 when she was late for a Bloodborne Pathogens (BBP) training session where she was to be one of three instructors.
   - **Training**:
     [redacted] self-confidence as a trainer/speaker increased as she rehearsed her training material. She could consult other resources to further improve her skills in preparing and delivering training. There are many resources on this topic such as: http://trainingtoday.blr.com/employee-training-resources/Prepare-for-Training.
     In addition to gaining confidence with the material, a trainer must also prepare for a training session by checking out the space, testing the training equipment (AV, projector, etc.), and preparing at least one backup system (thumb drive, hard copy). [redacted] did not have a backup copy of her internship summary presentation on her last day and risked being unable to present the information.

Overall:
[redacted] contributed positively to the Environmental Health and Safety program, specifically to the Hazcom and Hearing Loss Prevention programs and I hope she gained valuable knowledge and skills that will allow her to determine which area of Environmental Safety and Health she will pursue further.

Preceptor's Signature: **Date**: 9/4/2014

EH&S Director: Sylvie Adam
Sylvie Adam

EH&S Specialist:
Gary Ri[redacted]s

You are encouraged to discuss this evaluation with the student

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Leonardo	Sup Last Name:	Cambar

Organization:	CAMBA INC

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Good
Uses time effectively	Good
Reliably completes tasks on time	Good
Effectiveness in written communication	Good
Effectiveness in oral communication	Good
Ability to identify problems and proposes solutions	Fair
Overall quality or work produced	Good

B) Work Attitudes

Accepts responsibilities	Good
Takes initiative	Fair
Follows policies, rules, regulations, etc.	Good
Graciously accepts ideas and suggestions	Good
Perfoms tasks with industry and drive	Good

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Very good
Support staff	Very good
Supervisor	Very good
Personnel from other organizations	Very good
Clientele	Very good
General public	Very good

D) Application of community Health Skills

Assessing health problems	Good
Developing health objectives	Good
Planning health programs/projects	Good
Implementing programs/projects	Good
Evaluating programs/projects	Very good
Developing budgets	N/A
Applying research methodologies	Very good
Compiling health data/statistics	N/A
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Good
Tactfulness	Very good
Listening ability	Good
Sensitivity	Good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Good
What are the outstanding strengths of the intern?	Ms R biggest strength has been promoting the program and willingness to do street outreach. Also, network with partners through participating in community events and make herself available for when is need it. Juggle her hectic schedule.
What are the areas needing improvement?	Mrs. R can make some improvement taking independent actions to achieve goals assigned by planning activities and using time efficiently. Looks for and takes advantage of opportunities; Asks for and offers help when needed.
Other comments regarding the intern:	Ms. R is a hard worker that with time and gaining experience she will be able to reach desired goals.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Sarah	Sup Last Name:	Wolf

Organization:	NYC Department of Health and Mental Hygiene

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Very good
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Very good
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Very good

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	N/A
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	N/A
Planning health programs/projects	Very good
Implementing programs/projects	Very good
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	Very good
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	M has a great personality for the professional world which will take her far here at the Health Dept where relationships are so important. She is upbeat, positive, thoughtful is always looking for solutions for problems that arise.
What are the areas needing improvement?	I am looking forward to seeing more of M's work with planning, implementation of programs and writing. Thus far, there has been limited opportunity for her in these areas but I am confident that she will grow, including honing her planning skills and adapting her writing skills for the municipal government environment.
Other comments regarding the intern:	As M may have informed you, she has applied for and been offered a full-time grant funded position here at the Health Dept. She has been a pleasure to work with thus far and I'm excited about her addition to our team.

Future Opportunities

Would you be willing to take another student next semester?	Yes

ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCE
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: Carlstein Lutchmedial

Name of Agency: NYC Department of Environmental Protection Dates of Placement: 9/1/14 To: 12/16/14

Please check one box in each row

	Excellent (Performs on a Level that is Professional)	Above Average	Average (Needs to Improve)	Below Average	No Opportunity To Observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works	X				
b) Principles and concepts related to policy development					X
c) Concepts and procedures related to management					X
2. **Skills in:**					
a) Assessment	X				
b) Evaluation	X				
c) Budgetary processes					X
d) Policy implementation					X
e) Writing	X				
f) Oral communication	X				
g) Collaborative team work					X
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers	X				
2. Organizes and uses time effectively		X			
3. Listens attentively	X				
4. Facilitates work of program	X				
5. Submits accurate, well documented work and reports	X				
6. Accepts responsibility and completes work assignments	X				
7. Shows creativity or innovativeness		X			

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:
[redacted]s dedicated to his work. He puts in the necessary time and effort to complete the assigned tasks in a timely and effective manner.

2. Skills and knowledge needing further improvement:
[redacted]needs to learn to better recognize inefficiencies in his research methods. He also needs to improve his GIS skills.

3. Other comments:
Overall fieldwork was a good experience for the student and preceptor.

Preceptor's Signature [signature] **Date:** 12/17/2014

You are encouraged to discuss this evaluation with the student.

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Margaret	Sup Last Name:	Cook

Organization:	St. John's Episcopal Hospital

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Fair
Reliably completes tasks on time	Fair
Effectiveness in written communication	Very good
Effectiveness in oral communication	N/A
Ability to identify problems and proposes solutions	Fair
Overall quality or work produced	Fair

B) Work Attitudes

Accepts responsibilities	Good
Takes initiative	Fair
Follows policies, rules, regulations, etc.	Very good
Graciously accepts ideas and suggestions	Very good
Perfoms tasks with industry and drive	Fair

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Good
Support staff	Fair
Supervisor	Good
Personnel from other organizations	N/A
Clientele	Good
General public	Good

D) Application of community Health Skills

Assessing health problems	Good
Developing health objectives	N/A
Planning health programs/projects	N/A
Implementing programs/projects	Fair
Evaluating programs/projects	Fair
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	Good
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Fair
Tactfulness	N/A
Listening ability	N/A
Sensitivity	N/A

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Fair
What are the outstanding strengths of the intern?	Once we were able to create a schedule that worked for S, his attendance was good.
What are the areas needing improvement?	I would like to have seen more initiative from S. He encountered roadblocks in the task that he was performing, but he didn't bring these issues to my attention. It was only after I noticed that there was a trend in his daily reports and brought it up to him that we were able to discuss the issues he was facing and work on some solutions. I would like to have seen the initiative come from him to raise the issues and solve the problems.
Other comments regarding the intern:	S seems to get impatient when his expressed wishes are not complied with immediately, both by me and by the departmental support staff.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Nicole	Sup Last Name:	Ruffini

Organization:	Memorial Sloan Kettering Cancer Center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Very good
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Very good
Overall quality or work produced	Very good

B) Work Attitudes

Accepts responsibilities	Very good
Takes initiative	Very good
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	N/A
Clientele	Very good
General public	Very good

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	Very good
Planning health programs/projects	N/A
Implementing programs/projects	Very good
Evaluating programs/projects	Very good
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	N/A
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Very good
What are the outstanding strengths of the intern?	R is reliable and organized. R gets along well with all teammates, support staff, and patients, and completes her tasks in the expected time frames. R worked diligently to maintain our missing Versus badges, and assisted in follow-up with both staff and patients to ensure our workflow was maintained. Additionally, R educated other staff members on how to utilize the technology, and demonstrated drive and a willingness to learn.
What are the areas needing improvement?	R did a wonderful job excelling at the tasks given/suggested at the beginning of the internship, but I encourage her to continue to be innovative, and think of process improvements that may better improve our workflow and project work.
Other comments regarding the intern:	R did a wonderful job!

Future Opportunities

Would you be willing to take another student next semester?	Yes

Environmental and Occupational Health Science
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: Elizabeth Christakos-Cornack

Name of Agency: Con Edison Dates of Placement: 8/2014 To 12/2014

	Please check one box in each row				
	Excellent (Performs on a Level that is Professional)	**Above Average**	**Average** (Needs to Improve)	**Below Average**	No Opportunity To Observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works	✓				
b) Principles and concepts related to policy development		✓			
c) Concepts and procedures related to management	✓				
2. **Skills in:**					
a) Assessment	✓				
b) Evaluation	✓				
c) Budgetary processes		✓			
d) Policy implementation	✓				
e) Writing		✓			
f) Oral communication		✓			
g) Collaborative team work		✓			
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers	✓				
2. Organizes and uses time effectively	✓				
3. Listens attentively	✓				
4. Facilitates work of program	✓				
5. Submits accurate, well documented work and reports	✓				
6. Accepts responsibility and completes work assignments	✓				
7. Shows creativity or innovativeness		✓			

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:
2. Skills and knowledge needing further improvement:
3. Other comments:

Preceptor's Signature _____ **Date:** 12/17/14

You are encouraged to discuss this evaluation with the student.

ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCE
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: Hector Hernandez

Name of Agency: NYC Department of Transportation Dates of Placement: July 1, 2014 To: Nov 15, 2014

Please check one box in each row.

	Excellent (Performs on a Level that is Professional)	**Above Average**	**Average** (Needs to Improve)	**Below Average**	No Oppotunity To Observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works	✓				
b) Principles and concepts related to policy development					✓
c) Concepts and procedures related to management					✓
2. **Skills in:**					
a) Assessment	✓				
b) Evaluation	✓				
c) Budgetary processes					✓
d) Policy implementation					✓
e) Writing	✓				
f) Oral communication	✓				
g) Collaborative team work	✓				
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers	✓				
2. Organizes and uses time effectively	✓				
3. Listens attentively	✓				
4. Facilitates work of program	✓				
5. Submits accurate, well documented work and reports	✓				
6. Accepts responsibility and completes work assignments	✓				
7. Shows creativity or innovativeness	✓				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:
2. Skills and knowledge needing further improvement:
3. Other comments:

Preceptor's Signature [signature] **Date:** 11/14/2014

You are encouraged to discuss this evaluation with the student.

[redacted] is a very detail oriented individual with an eagerness to learn. Her work is very accurate, completes all tasks in a timely manner, is very inquisitive, and has excellent analytical skills. [redacted] is a pleasure to work with at New York City Department of Transportation.

Hector Hernandez

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 6/21/14

Preceptor(s) name: Christopher Racine, MD, MPH

Title(s): Forensic Fellow

Agency/department: NYU/Bellevue

Phone: 212-562-4335 e-mail: racinc02@nyumc.org

Agency address: 462 1st avenue, ny, ny

Name of student intern:

Did the student complete the required 180 hours? X Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently		**X**			
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences		**X**			
Reliably completes tasks on time		**X**			
Effectiveness in written communication		**X**			
Effectiveness in oral communication		**X**			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot		**X**			
Analytical ability		**X**			
Ability to work on a team	**X**				
Overall quality of work produced		**X**			
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**X**				
Takes initiative		**X**			
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations	**X**				
Participants/clients/patients	**X**				
General public	**X**				
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
unpublished literature					
Assessing health problems	**X**				
Developing health objectives	**X**				
Using health-related data	**X**				
Planning & developing health programs and projects	**X**				
Managing health programs	**X**				
Evaluating health programs	**X**				
Data collection activities	**X**				
Analyzing data		**X**			
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

Yes, K was a wonderful addition to the research project. He brought both enthusiasm and drive. He was committed and inquisitive. He will make a wonderful clinician/leader in the future.

2. Would you like to continue participating in the Lehman MPH internship program?

☐ Yes X No ☐ Not sure

-Both of the preceptors are leaving the institution.

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 6/6/14

Preceptor(s) name: Arlene Ortiz-Allende

Title(s): Sr. VP

Agency/department: St. Barnabas Hospital

Phone: 718-960-9476 e-mail: aallende@sbhny.org

Agency address: 4422 Third Avenue, Bronx, NY 10467

Name of student intern:

Did the student complete the required 180 hours? x Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**X**				
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences	**X**				
Reliably completes tasks on time	**X**				
Effectiveness in written communication		**X**			
Effectiveness in oral communication		**X**			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot		**X**			
Analytical ability		**X**			
Ability to work on a team	**X**				
Overall quality of work produced		**X**			
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes	**X**				
Accepts responsibility	**X**				
Takes initiative	**X**				
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(please specify) respectful of and engaged with institutional values*	**X**				
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations	**X**				
Participants/clients/patients		**X**			
General public		**X**			
Other *(please specify) connected with professional staff for personal assessment and growth*	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Application of community health skills					
Obtaining & using appropriate information from published and unpublished literature		**X**			
Assessing health problems		**X**			
Developing health objectives		**X**			
Using health-related data		**X**			
Planning & developing health programs and projects		**X**			
Managing health programs		**X**			
Evaluating health programs		**X**			
Data collection activities		**X**			
Analyzing data		**X**			
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?
   T's work resulted in a logic model outline for grant funding on an anti-obesity program; reassessment of current patient rights and financial aid compliance levels and a thorough review of the Community Service Plan stated objectives and assessment of the measures and goals

2. Would you like to continue participating in the Lehman MPH internship program?
   x Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 5/28/14

Preceptor(s) name: Nirah Johnson

Title(s): LCSW, Director of Program Implementation & Capacity Building

Agency/department: NYC DOHMH, Communicable Diease

Phone: (347) 396-2416 e-mail: njohnso2@health.nyc.gov

Agency address: 42-09 28th Street Queens, NY 11101

Name of student intern:

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**x**				
Uses time effectively	**x**				
Informs supervisor and makes arrangements for absences	**x**				
Reliably completes tasks on time	**x**				
Effectiveness in written communication			**x**		
Effectiveness in oral			**x**		

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
communication					
Ability to identify problems and troubleshoot		**x**			
Analytical ability		**x**			
Ability to work on a team	**x**				
Overall quality of work produced	**x**				
Other *(please specify)* Creative thinking, takes initiative	**x**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**x**				
Takes initiative	**x**				
Follows policies, rules, regulations of agency	**x**				
Accepts ideas and suggestions of others	**x**				
Performs tasks with industry and drive	**x**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**x**				
Support staff	**x**				
Supervisor	**x**				
Personnel from other organizations	**x**				
Participants/clients/patients	**x**				
General public	**x**				
Other *(please specify)*	**x**				
Application of community health skills					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Obtaining & using appropriate information from published and unpublished literature			**x**		
Assessing health problems		**x**			
Developing health objectives		**x**			
Using health-related data		**x**			
Planning & developing health programs and projects		**x**			
Managing health programs					**x**
Evaluating health programs		**x**			
Data collection activities		**x**			
Analyzing data		**x**			
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

Internship has been mutually beneficial. Wish it was one year long!

2. Would you like to continue participating in the Lehman MPH internship program?
   ☒ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: May 19, 2014

Preceptor(s) name: Brett Gray, ANP, MPH

Title(s): Clinical Trials Unit Coordinator

Agency/department: NewYork-Presbyterian Hospital/Columbia University Medical Center

Phone: 212-305-1570 e-mail: bg2168@cumc.columbia.edu

Agency address: 180 Fort Washington Avenue, 6th Floor, New York, NY, 10032

Name of student intern:

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**X**				
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences					**X**
Reliably completes tasks on time	**X**				
Effectiveness in written communication	**X**				
Effectiveness in oral communication	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot	**X**				
Analytical ability	**X**				
Ability to work on a team	**X**				
Overall quality of work produced	**X**				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**X**				
Takes initiative	**X**				
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations	**X**				
Participants/clients/patients	**X**				
General public	**X**				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Application of community health skills					
Obtaining & using appropriate information from published and unpublished literature	**X**				
Assessing health problems	**X**				
Developing health objectives	**X**				
Using health-related data	**X**				
Planning & developing health programs and projects	**X**				
Managing health programs	**X**				
Evaluating health programs	**X**				
Data collection activities	**X**				
Analyzing data	**X**				
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

Yes, this experience has been a tremendous benefit to the clinic and the patients we care for. Overall the testing phase showed that patients were receptive to the screening process. We identified a few challenges with regards to staffing issues that require further assessment before screening can be fully implemented. We would not be at this stage without K's hard work on this project the last few months.

2. Would you like to continue participating in the Lehman MPH internship program?
   ☐ Yes ☒ No ☐ Not sure
   I have recently transitioned to a new role and unfortunately will not have the capacity to precept a student in the future.

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

LEHMAN COLLEGE

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 05/01/14

Preceptor(s) name: Nicole M. Schuett

Title(s): Director of Health Literacy & Education

Agency/department: Urban Health Plan, Inc.

Phone: 347-414-3621 e-mail: nicole.schuett@urbanhealthplan.org

Agency address: 1065 Southern Boulevard, Bronx, NY 10459

Name of student intern: [redacted]

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently		√			
Uses time effectively	√				
Informs supervisor and makes arrangements for absences		√			
Reliably completes tasks on time	√				
Effectiveness in written communication		√			
Effectiveness in oral communication		√			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot		✓			
Analytical ability		✓			
Ability to work on a team					N/A
Overall quality of work produced	✓				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	✓				
Takes initiative		✓			
Follows policies, rules, regulations of agency	✓				
Accepts ideas and suggestions of others	✓				
Performs tasks with industry and drive	✓				
Other *(please specify)*					
Professional relationships with:					
Professional staff		✓			
Support staff		✓			
Supervisor	✓				
Personnel from other organizations					N/A
Participants/clients/patients					N/A
General public		✓			
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and	✓				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
unpublished literature					
Assessing health problems		✓			
Developing health objectives		✓			
Using health-related data	✓				
Planning & developing health programs and projects		✓			
Managing health programs					N/A
Evaluating health programs					N/A
Data collection activities		✓			[redacted]
Analyzing data	✓				
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program? Yes, [redacted] internship that was very useful to UHP. No suggestions at this time

2. Would you like to continue participating in the Lehman MPH internship program?
   ☒ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Joseph	Sup Last Name:	Martinez

Organization:	Woodhull Medical and Mental Health Center

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Very good
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Very good
Follows policies, rules, regulations, etc.	Very good
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	N/A
Support staff	N/A
Supervisor	Excellent
Personnel from other organizations	N/A
Clientele	N/A
General public	N/A

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	N/A
Implementing programs/projects	Excellent
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Very good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	Ms M is a self motivated, attentive and intelligent individual who immediately grasps instructions and is able to apply them to her work quite quickly. Ms. M is willing to learn and understand the task at hand and will ask questions only when necessary in order to complete her assignments timely and efficiently. Ms. M has exhibited the ability to retain what she has leaned and utilize it in future endeavors. Ms. M is a pleasant and polite individual who is easy to work with.
What are the areas needing improvement?	Ms. M needs to be more self confident in her abilities. She is a very intelligent and bright young woman and sometimes does not give herself enough credit.
Other comments regarding the intern:	None

Future Opportunities

Would you be willing to take another student next semester?	No

LEHMAN COLLEGE

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 6/13/14

Preceptor(s) name: Natalie Terens

Title(s): Program Coordinator

Agency/department: Public Health Solutions, Food and Nutrition Unit

Phone: 9083392032 e-mail: nterens@healthsolutions.org

Agency address: 40 Worth Street 5th Floor, New York, NY 10103

Name of student intern: [redacted]

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	✓				
Uses time effectively	✓				
Informs supervisor and makes arrangements for absences	✓				
Reliably completes tasks on time	✓				
Effectiveness in written communication	✓				
Effectiveness in oral communication	✓				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot	✓				
Analytical ability	✓				
Ability to work on a team	✓				
Overall quality of work produced	✓				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	✓				
Takes initiative	✓				
Follows policies, rules, regulations of agency	✓				
Accepts ideas and suggestions of others	✓				
Performs tasks with industry and drive	✓				
Other *(please specify)*					
Professional relationships with:					
Professional staff	✓				
Support staff	✓				
Supervisor	✓				
Personnel from other organizations	✓				
Participants/clients/patients	✓				
General public	✓				
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and	✓				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
unpublished literature					✓
Assessing health problems					✓
Developing health objectives					✓
Using health-related data					✓
Planning & developing health programs and projects	✓				
Managing health programs	✓				
Evaluating health programs	✓				
Data collection activities	✓				
Analyzing data	✓				
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program? yes -

2. Would you like to continue participating in the Lehman MPH internship program?
   ☑ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

It was such a pleasure to have [redacted]

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 06/17/14

Preceptor(s) name: Mary Huynh

Title(s): Assistant Professor

Agency/department: Department of Health Sciences, Lehman College

Phone: 347-577-4006 e-mail: mary.huynh@lehman.cuny.edu

Agency address: 250 Bedford Park Blvd, Bronx, NY

Name of student intern:

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently		**x**			
Uses time effectively		**x**			
Informs supervisor and makes arrangements for absences		**x**			
Reliably completes tasks on time		**x**			
Effectiveness in written communication		**x**			
Effectiveness in oral communication		**x**			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot			**x**		
Analytical ability			**x**		
Ability to work on a team					**x**
Overall quality of work produced		**x**			
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility		**x**			
Takes initiative		**x**			
Follows policies, rules, regulations of agency		**x**			
Accepts ideas and suggestions of others		**x**			
Performs tasks with industry and drive		**x**			
Other *(please specify)*					
Professional relationships with:					
Professional staff					**x**
Support staff					**x**
Supervisor		**x**			
Personnel from other organizations					**x**
Participants/clients/patients					**x**
General public		**x**			
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and		**x**			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
unpublished literature					
Assessing health problems		**x**			
Developing health objectives			**x**		
Using health-related data			**x**		
Planning & developing health programs and projects					**x**
Managing health programs					**x**
Evaluating health programs					**x**
Data collection activities					**x**
Analyzing data					**x**
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

Yes, I's work assisted me in moving a research project forward.

2. Would you like to continue participating in the Lehman MPH internship program?
   ☒ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: May 4, 2014

Preceptor(s) name: Monica Traczik

Title(s): Director of Nursing, Ambulatory Care

Agency/department: Jacobi Medical Center , Ambulatory Care

Phone: 718-918-4314 e-mail: Monica.Traczik@nbhn.net

Agency address: 1400 Pelham Parkway, Bronx, NY. 10461

Name of student intern:

Did the student complete the required 180 hours? X☐ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**x**				
Uses time effectively	**x**				
Informs supervisor and makes arrangements for absences					**x**
Reliably completes tasks on time	**x**				
Effectiveness in written communication	**x**				
Effectiveness in oral communication	**x**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot	**x**				
Analytical ability	**x**				
Ability to work on a team					**x**
Overall quality of work produced	**x**				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**x**				
Takes initiative	**x**				
Follows policies, rules, regulations of agency	**x**				
Accepts ideas and suggestions of others	**x**				
Performs tasks with industry and drive	**x**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**x**				
Support staff	**x**				
Supervisor	**x**				
Personnel from other organizations					**x**
Participants/clients/patients					**x**
General public					**x**
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and	**x**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
unpublished literature					
Assessing health problems	**x**				
Developing health objectives	**x**				
Using health-related data	**x**				
Planning & developing health programs and projects	**x**				
Managing health programs					**x**
Evaluating health programs					**x**
Data collection activities					**x**
Analyzing data					**x**
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

Yes, the internship was useful, C created a presentation which was presented at a Nursing Grand Rounds on Cultural Awareness for Health Care providers and a chart for cultural differences and a helpful list of do's and don't for participants.

2. Would you like to continue participating in the Lehman MPH internship program?
   X☐ Yes ☐ No ☐ Not sure-- Although, my position is quite demanding and time consuming so it is a factor.

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 5/10/14

Preceptor(s) name: Gina Quattrochi

Title(s): CEO – Bailey House

Agency/department: CEO

Phone: 917-282-1571 e-mail: rqbh@baileyhouse.org

Agency address: 1751 Park Ave. NY, NY 10035

Name of student intern:

Did the student complete the required 180 hours? X☐ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**X**				
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences	**X**				
Reliably completes tasks on time	**X**				
Effectiveness in written communication				**X:needs work in this area**	
Effectiveness in oral communication		**X**			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot		**X**			
Analytical ability			**X**		
Ability to work on a team					**X**
Overall quality of work produced			**X**		
Other *(please specify)*able to accept and act upon constructive criticism	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes	**X**				
Accepts responsibility	**X**				
Takes initiative	**X**				
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations					**X**
Participants/clients/patients			**X**		
General public					**X**
Other *(please specify)*					
Application of community health skills					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Obtaining & using appropriate information from published and unpublished literature			**X**		
Assessing health problems		**X**			
Developing health objectives			**X**		
Using health-related data			**X**		
Planning & developing health programs and projects		**X**			
Managing health programs					**X**
Evaluating health programs					**X**
Data collection activities		**X:above average in collection but needs help in analyzing and applying data**			
Analyzing data			**X**		
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

   A's work is very helpful and has already resulted in the revision in our food pantry intake forms so we may capture more data about the connection between housing instability and food insecurity. Her work also helped us think through how to create a new Eviction Prevention Plan that contains all the necessary elements to help low-income individuals living with HIV/AIDS and other chronic illnesses to achieve improved housing and health outcomes.

   One of the concerns I have, as I mentioned a couple of months ago, is that A's writing skills are average at best. She needed significant help in structuring her final paper, create content

that was logical, user friendly and impactful. After much discussion with her, she is taking a writing class this summer.

As a former Capstone professor at the NYU Wagner School for 10 years, I am very aware of and concerned about how little attention is paid, even at the graduate level, to student writing skills. Professors must be encouraged or incentivized to deal with this issue rather than ignoring it as many high school teachers clearly did. Poor writing skills will halt a career before it starts. If as educators we are committed to CUNY students' success, they must take responsibility for helping their students identify and improve those skills that if not addressed will hold students back.

At the very least, professors should be required to refer students to the writing tutoring center and Lehman must extend the tutoring center hours to accommodate evening and night students. I imagine there are other measures as well. Ignoring these deficits not only harms the student's prospect for a career but also reflects poorly on CUNY.

2. Would you like to continue participating in the Lehman MPH internship program?
   X☐ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Signed: Gina Quattrochi May 12, 2014

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: April 14, 2014

Preceptor(s) name: Karen Mohammed

Title(s): Clinical Director

Agency/department: Phoenix House Foundation Inc., Jack Aron Outpatient Program

Phone: 646 505 2000ext. 7724 e-mail: kmohammed@phoenixhouse.org

Agency address: 164 W. 74 Street, NY, NY, 10023

Name of student intern:

Did the student complete the required 180 hours? Yes

If no, please explain: As of 4/1/14 Mr. Pitts has completed the 180 hours

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**X**				
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences		**X**			
Reliably completes tasks on time	**X**				
Effectiveness in written communication		**X**			
Effectiveness in oral communication	**X**				
Ability to identify problems and troubleshoot	**X**				
Analytical ability	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to work on a team	**X**				
Overall quality of work produced	**X**				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes	**X**				
Accepts responsibility	**X**				
Takes initiative		**X**			
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations		**X**			
Participants/clients/patients	**X**				
General public	**X**				
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and unpublished literature	**X**				
Assessing health problems	**X**				
Developing health objectives	**X**				
Using health-related data		**X**			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Planning & developing health programs and projects	**X**				
Managing health programs	**X**				
Evaluating health programs					**X**
Data collection activities	**X**				
Analyzing data	**X**				
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship useful for your agency?

   As a direct result of the focus groups and the feedback back provided, the Jack Aron Program staff has implemented (3) new groups for the target population. The groups are as follows:

   - Co-occurring Mental Health and Substance Abuse Treatment Group
   - A Psycho Educational Group
   - Sex Addiction Treatment Group

   The Sex addiction curriculum will be the first one implemented for utilization at the Phoenix House Foundation. In addition, the New Evidence Based Practice (EBP) curriculums were researched and identified to support generalist practice for the specialize population. The new EBP curriculums are Building Social Support, Managing Emotions, and a Treatment Curriculum called Sex Addiction Module. Prior screening tools utilized by the agency failed to identify appropriate clients for services, which in return created barriers in the learning environment. The new screening tool developed by the team appeared to be more comprehensive when identifying appropriate clients for program services.

   In summary, the program staff learned that the young adults appeared to be in unhealthy relationships with their significant others, had poor decision making skills, they also utilize marijuana and alcohol frequently within the last six months with a few on psycho tropic medications for depression. Lastly, due to the provided information, an Outreach Worker's position will be created within the next 45 days to conduct case management, case advocacy and make referrals to appropriate treatment providers for mental health services. Substance Abuse treatment services will continue to be on site. The information provided from the focus groups was informative and necessary for overall program development.

2. Are there any suggestions you would like to make for the internship program? Not at this time.

3. Would you like to continue participating in the Lehman MPH internship program? Yes

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

LEHMAN COLLEGE

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 5/29/14

Preceptor(s) name: Natalie Terens

Title(s): Program Coordinator

Agency/department: Public Health Solutions, Food and Nutrition

Phone: 908.339.2032 e-mail: nterens@healthsolutions.org

Agency address: 40 Worth St., 5th floor New York, NY 10013

Name of student intern: [redacted]

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	X				
Uses time effectively	X				
Informs supervisor and makes arrangements for absences	X				
Reliably completes tasks on time		X			
Effectiveness in written communication			X		
Effectiveness in oral communication	X				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot	X				
Analytical ability		X			
Ability to work on a team					X
Overall quality of work produced		X			
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	X				
Takes initiative		X			
Follows policies, rules, regulations of agency	X				
Accepts ideas and suggestions of others	X				
Performs tasks with industry and drive		X			
Other *(please specify)*					
Professional relationships with:					
Professional staff	X				
Support staff	X				
Supervisor	X				
Personnel from other organizations	X				
Participants/clients/patients	C				
General public	X				
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
unpublished literature					X
Assessing health problems					X
Developing health objectives					X
Using health-related data					X
Planning & developing health programs and projects		X			
Managing health programs		X			
Evaluating health programs		X			
Data collection activities		X			
Analyzing data		X			
Other *(please specify)*					

B. Overall Feedback on Internship:

4. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?
I wish I had more constructive work sessions with [redacted] to review his data and report. Monthly in-person meetings would be helpful.

5. Would you like to continue participating in the Lehman MPH internship program?
☒ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Pamela D.	Sup Last Name:	Straker, Ph.D.
Organization:	Brooklyn Health Disparities Center, Inc		

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	Excellent
Implementing programs/projects	N/A
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	N/A
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	L has a keen interest in health disparities and an aptitude for understanding the complexity of the issues associated with and played a significant role in forwarding the goals of BHDC in the short time she has been with us. She is able to take on projects, work them through and offer solutions for challenges encountered. With her assistance we held our 2014 Spring Conference, enhanced our website, and clarified our social media connections so important to our ability to communicate effectively. She is working on a research paper that we hope may be featured on our web site.
What are the areas needing improvement?	None Noted
Other comments regarding the intern:	We need more like L!

Future Opportunities

Would you be willing to take another student next semester?	Yes

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 5/21/2014

Preceptor(s) name: **Chamanara Khalida, MD, MPH**

Title(s): **Project Manager**

Agency/department: ***Clinical* Directors Network (CDN)**

Phone: **212-382-0699** e-mail: **ckhalida@cdnetwork.org**

Agency address: **5 West 37th Street, 10th floor, New York, NY 10018**

Name of student intern: [redacted]

Did the student complete the required 180 hours? ☒Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**X**				
Uses time effectively		**X**			
Informs supervisor and makes arrangements for absences	**X**				
Reliably completes tasks on time	**X**				
Effectiveness in written communication			**X**		
Effectiveness in oral		**X**			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
communication					
Ability to identify problems and troubleshoot			**X**		
Analytical ability		**X**			
Ability to work on a team	**X**				
Overall quality of work produced		**X**			
Other *(please specify)*					**X**

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**X**				
Takes initiative		**X**			
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive		**X**			
Other *(please specify)*					**X**
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations	**X**				
Participants/clients/patients	**X**				
General public					**X**
Other *(please specify)*					**X**
Application of community health skills					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Obtaining & using appropriate information from published and unpublished literature		**X**			
Assessing health problems					**X**
Developing health objectives			**X**		
Using health-related data		**X**			
Planning & developing health programs and projects					**X**
Managing health programs					**X**
Evaluating health programs					**X**
Data collection activities	**X**				
Analyzing data		**X**			
Other *(please specify)*					**X**

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

Yes ,the Internship was helpful for our agency. He learned a lot, and acquired practical experiences and it was a pleasure to work with him.

2. Would you like to continue participating in the Lehman MPH internship program?

☒Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 5/16/2014

Preceptor(s) name: Dr. Hector Reyes

Title(s): MD, MBA, President

Agency/department: 181 UCC

Phone: 917-771-9827 e-mail: reyes@reynet.net

Agency address: 521 West 181 Street, New York, NY

Name of student intern:

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**X**				
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences	**X**				
Reliably completes tasks on time	**X**				
Effectiveness in written communication	**X**				
Effectiveness in oral communication	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot		**X**			
Analytical ability		**X**			
Ability to work on a team	**X**				
Overall quality of work produced	**X**				
Other *(Data Collection and Reporting)* very reliable and organized	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**X**				
Takes initiative	**X**				
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(Self-Engaging)*	**X**				
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations		**X**			
Participants/clients/patients	**X**				
General public	**X**				
Other *(please specify)* Very tactful and professional					
Application of community health skills					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Obtaining & using appropriate information from published and unpublished literature	**X**				
Assessing health problems		**X**			
Developing health objectives		**X**			
Using health-related data	**X**				
Planning & developing health programs and projects	**X**				
Managing health programs					**X**
Evaluating health programs					**X**
Data collection activities	**X**				
Analyzing data	**X**				
Other *(Familiar with community resources for health care)*		**X**			

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?
   The internship Y was involved with was very useful for my organization. We recently opened, about a year ago, and want to gain the trust of the community. This community has a lot to improve with regard to health, and our goal is to educate patients not just treat them. Y was instrumental in helping us to educate ourselves, and getting the message across the community.

2. Would you like to continue participating in the Lehman MPH internship program?
   ☒ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Dave	Sup Last Name:	Bryan

Organization:	Brooklyn College Health Programs Immunization Requirements Office

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Very good
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Very good
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Very good

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	N/A
Clientele	Very good
General public	N/A

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	N/A
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	N/A
Compiling health data/statistics	Very good
Facilitating group process	Very good

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	Mr. W was very enthusiastic about the internship and driven to share his acquired knowledge on health education. He arrived to work on time and ready to learn and contribute to the process. He displayed initiative by sharing ideas on how we can increase the number of students at events. He immediately focussed on sharing event information with both faculty and students in the Health and Nutrition Science department and with students that utilized the Library Cafe'.
What are the areas needing improvement?	Mr. W needs to focus on becoming proficient in social media devices as a means to communicate to the young adult population.
Other comments regarding the intern:	It was a pleasure working with Mr. W. I am sure he will bring his energy and enthusiasm to improving the health education network in the community.

Future Opportunities

Would you be willing to take another student next semester?	Yes

LEHMAN COLLEGE

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 06/06/2014

Preceptor(s) name: Rajat Singh, MD

Title(s): Assistant Professor

Agency/department: Albert Einstein/Medicine

Phone: 718-430-4118 e-mail: rajat.singh@einstein.yu.edu

Agency address: 1300 Morris Park Avenue, Bronx, NY 10461

Name of student intern: [redacted]

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**X**				
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences	**X**				
Reliably completes tasks on time	**X**				
Effectiveness in written communication	**X**				
Effectiveness in oral communication	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot	**X**				
Analytical ability	**X**				
Ability to work on a team		**X**			
Overall quality of work produced	**X**				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**X**				
Takes initiative	**X**				
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations	**X**				
Participants/clients/patients	**X**				
General public	**X**				
Other *(please specify)*					
Application of community health skills					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Obtaining & using appropriate information from published and unpublished literature	**X**				
Assessing health problems	**X**				
Developing health objectives	**X**				
Using health-related data	**X**				
Planning & developing health programs and projects	**X**				
Managing health programs	**X**				
Evaluating health programs	**X**				
Data collection activities	**X**				
Analyzing data	**X**				
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

This internship was extremely useful for me and my agency. [redacted] was an great addition to our team.

2. Would you like to continue participating in the Lehman MPH internship program?
   ☐ Yes ☐ No ☒ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

INTERNSHIP REFLECTION PAPER

I. Overview

The Diabetes Research Center (DRC) at the Albert Einstein College of Medicine delivers strong academic and research program that serves as a training atmosphere for creative basic and translational research linked to the causes and treatment of diabetes and its complications. The DRC is equipped with a collaborative forward-looking infrastructure that includes several components and multiple tools to facilitate diabetes prevention and control. The DRC supports an avant-garde relationship amid research, training, clinical and community-based activities. The DRC is major National Institutes of Health (NIH)-funded project that encompasses different components, which are: the Administrative Core, Animal Physiology Core, Metabolomics Core, Human Islet Core, Analytical Research Core, Translational Research Core, and a Prevention and Control Core. The Einstein DRC Prevention and Control (P&C) Core provides the necessary linkages from basic science, epidemiology, and translational research in order to aid, treat and prevent patients from complications relating to diabetes. The P&C Core provides support across a broad range of research and community projects for primary, secondary and tertiary prevention in diabetes and related conditions. Through three distinct functional units, it provides the focal point for addressing health disparities among minority populations and underserved communities. [Figure 1]

My preceptor, Dr. Rajat Singh is a distinguished faculty member at the Albert Einstein College of Medicine. Dr. Singh's research interest is in understanding roles for hypothalamic neuron-specific autophagy in the regulation of overall energy balance, in particular, how changes in neuronal autophagy contribute to the development of the metabolic syndrome of aging. Dr. Singh has 8 years of experienced work on cellular mechanisms contributing to the manifestations

of metabolic syndrome, and 5 years of experience in studying autophagy. Recent work from his laboratory has revealed that autophagy in hypothalamic agouti-related peptide (AgRP) neurons links neuronal lipid metabolism to orexigenic AgRP expression (Kaushik et al, 2011), and that AgRP neuron-specific loss of autophagy decreases food intake and promotes a lean phenotype. As a mentor in his current grant, Dr. Singh has focused his efforts in the following areas: 1) determining whether nutrient, and hormonal activation of Macroautophagy in POMC neurons is mechanistically linked to peripheral energy expenditure; and 2) to examining whether restoration of hypothalamic MA using a novel scheduled-feeding intervention reverses or prevents the development of the metabolomics syndrome of aging. Dr. Singh's laboratory has standardized procedures to characterize autophagy in hypothalamic neurons, and his background in physiology and cell biology makes him well suited to serve as my preceptor in my internship. My role in this project was to investigate the connection that the Einstein Diabetes Research Center has with research conducted in Dr. Singh's lab, as well as analyze this link, mainly in relation to the Prevention and Control Core. The ultimate goal of the DRC is find innovation, through research, that can develop new therapies for the prevention and treatment of diabetes.

Montefiore Medical Center (MMC) is Einstein's primary affiliated academic health center. The Clinical Diabetes Center at Montefiore provides a wide-range care for adults with diabetes. My internship site consisted of several healthcare locations within the MMC community, which were:

Montefiore Hospital
111 East 210th Street
Bronx, NY 10467
Phone: 718-920-4321

Weiler Hospital

1825 Eastchester Road
Bronx, NY 10461
Phone: 718-904-2000

Wakefield Hospital
600 East 233rd Street
Bronx, NY 10466
Phone: 718-920-9000

The Clinical Diabetes Center at Montefiore Medical Center is a center that was created from the collaboration with the DRC at the Albert Einstein College of Medicine. Montefiore and its affiliates are committed to serving their immediate community, which includes a large Hispanic population. The clinic serves adults age 18 and older who are referred by their primary care physician for education and self-management of complications that stem from the endocrine system. The clinic provides diabetes education which includes nutrition counseling, insulin pump training and subcutaneous glucose monitoring. The goal is to teach and empower patients to improve their health through better management of diet and prescribed medications.

II. Reflecting on the process of conducting your internship project

The Clinical Diabetes Center at Montefiore has been an instrumental institution for recruitment in several landmark studies including the Diabetes Control and Complications Trial, the Diabetes Prevention Program Outcomes Study (DPPOS), the Epidemiology of Diabetes Interventions and Complications (EDIC) study, the Preventing Early Renal Loss (PERL) in Diabetes study, and the Glycemia Reduction Approaches in Diabetes: A Comparative Effectiveness (GRADE) study. The study that I mainly participated in was the GRADE study. A brief description of the GRADE study is the involvement of 5,000 patients to be randomly assigned to take one of four medications that lower blood glucose. In addition to the randomly assigned medication, each of the 150+ individuals taking part at the Einstein-Montefiore trial site

will receive nutritional advice and education in diabetes control and prevention. My duties as a research administrator during my internship was to recruit subjects, coordinate screening and study visits, manage study compliance with IRB regulations, obtain informed consent and HIPAA authorization, administer research questionnaires and psychological tests, complete the necessary records and data entry and study related measurements and other administrative tasks such as coordinate DRC workshops and conferences.

When I am not at the clinical recruitment sites, I spend a great deal of time in the lab. Dr. Singh research deals primarily in the basic sciences and uses animals as test subjects. Dr. Singh research suggests that the metabolic syndrome is characterized by obesity, hypertension, hyperlipidemia, and glucose intolerance. I worked along-side the associates in the lab to operate centrifuges, maintain laboratory equipment, arrange specimens for examinations, and keep lab in sanitary conditions and in accordance to safety procedures. The members of my team of associates and technicians that I worked with were Nuria Martinez-Lopez, Srabani Sahu and Diana Athonvarangkul. During the initial weeks of my internship I often struggled to find my way around this new environment in which I did not have any prior experience with. I had difficulties understanding the terminologies that were often spoken among the members in the lab. Looking back, there are many things that I would have done differently had I began my internship project today. I truly believe that the stress of maintaining my employment, attending classes, and participating in m internship began to collide with one another. My schedule was dense and my patience was slim. I felt as though I was working two jobs and going to school. Patient recruitment was not an easy task as well. I had to maintain a professional demeanor while dealing with the different personalities that walked into the clinic. My preceptor mentored and guided me through this process of taking steps that would enabled me to engage myself in a

more productive way with his team in the lab and the clinic. Dr. Singh often spoke to me at meetings and mentioned how disconnected I appeared to be. He reassured me that it perfectly fine if I did not understand some of the concepts in this field of science and everyone started their careers not knowing much of what they do. The discussions I had with Dr. Singh about my presence in his project humbled me. I was delighted to understand that I would be measured on my efforts in how I adapted to the work and not entirely on whether or not I completed the work. Four months is a very short time to accomplish measurable data to complete a research that is budgeted for five years. In addition to my duties in at the clinic and in the lab, I supervised the purchasing, receiving, storing, and distribution of laboratory equipment used by the members in his project.

III. Reflecting on the content and implications of your internship project

The primary mission of the Einstein DRC P&C core is to promote high-quality diabetes translational research, through the delivery of services that consist of consultation, training and mentoring in clinical research methods that are specifically applicable to diabetes, its complications and related metabolic defects. These services derive from the broad expertise of investigators with distinct backgrounds, encompassing studies in clinical physiology, clinical trials involving diabetes, and obesity and patient-centered outcomes research; thus spanning the spectrum of translational research. The Einstein DRC provides cost effective, considerable design and implementation of human-based clinical and population based studies to improve our understanding and treatment of patients with diabetes.

Dr. Singh's research project employs sophisticated research methodologies to assist Einstein DRC investigators in the *in vivo* assessment of glucose and fatty acid metabolism,

insulin sensitivity and energy homeostasis in rodents. Through collaborative efforts, both Singh's lab and the P&C core can thoroughly characterize the effects of defined pharmacological, dietary, environmental and genetic alterations on glucose and lipid homeostasis, insulin action, and metabolism.

The importance of this project is the Einstein-Montefiore Diabetes Research Center (Einstein/Montefiore-DRC) continues to contribute to the discovery, application and translation of scientific knowledge for the treatment and cure of diabetes. Einstein/Montefiore-DRC serves as a nexus which enhance diabetes research, education and training; and promotes scientific findings from the bench to the bedside, and ultimately the community, especially in underserved and minority populations.

To accomplish these goals, I have recognized that it begins with small collaborative research and studies fostered by innovative investigators attempting to discover new ways to treat illnesses. The results from this project will help us modify treatment and improve blood glucose levels and circumvent some of the more preventable complications that can severely affect patients' lives. This internship was a great example for me as student to participate in. I was given the opportunity to see how my role impacts the overall goal of the project because I sincerely felt that my contributions were essential, however minor it may have appeared to be, to the grand project. My participation this semester was a great public health practice because my duties in the internship played a role in research that develops new therapies for prevention and treatment of diabetes.

IV. Overall Reflection

The goals that I set at the beginning of the semester on the logic model were to: 1) improve my ability to integrate public health theory with community based training, 2) improve my communication and professional skills attained from on-site training, and 3) improve my leadership skills and responsibilities for planning and administration of lab activities. The community based care that Montefiore Medical Center provides ensures that local residents, including the two million people that reside in the Bronx, have access to quality health care. Montefiore Medical Group have more than 20 local community sites that actively educates there patients about issues that promotes healthier lifestyles. MMC is a major site for NIH funded research in clinical trials and an excellent training atmosphere for theories in community based training, and for improving my communications and leadership skills. Therefore, I definitely achieved the goals that I outlined for myself on my logic model.

Diabetes, its complications, and related endocrine diseases are a major focus of public health concern at the local, national and global levels. The success of Einstein's research programs derives in large part from synergistic interdisciplinary collaborations. I received the most satisfaction out my experience in my internship because I was able to witness and contribute to this form collaboration. From my involvement in the Diabetes Center Conferences to the administration of lab supplies, I was able to play an instrumental part in research and how innovation is created.

I am approaching the very end of my journey as a student in the CUNY School of Public Health at Lehman College and my take-away from my experiences during these years and during my internship, is that the health of my community is essential and directly linked to my own. I am more passionate about the policies that contribute to the well-being of my community.

Therefore, I vow to be an active participant from this point forward in the issues that relates to the science and policies of the public health community.

Reference:

Kaushik, S., Rodriguez-Navarro, J. A., Arias, E., Kiffin, R., Sahu, S., Schwartz, G. J., ... & Singh, R. (2011). Autophagy in hypothalamic AgRP neurons regulates food intake and energy balance. *Cell metabolism*, *14*(2), 173-183.

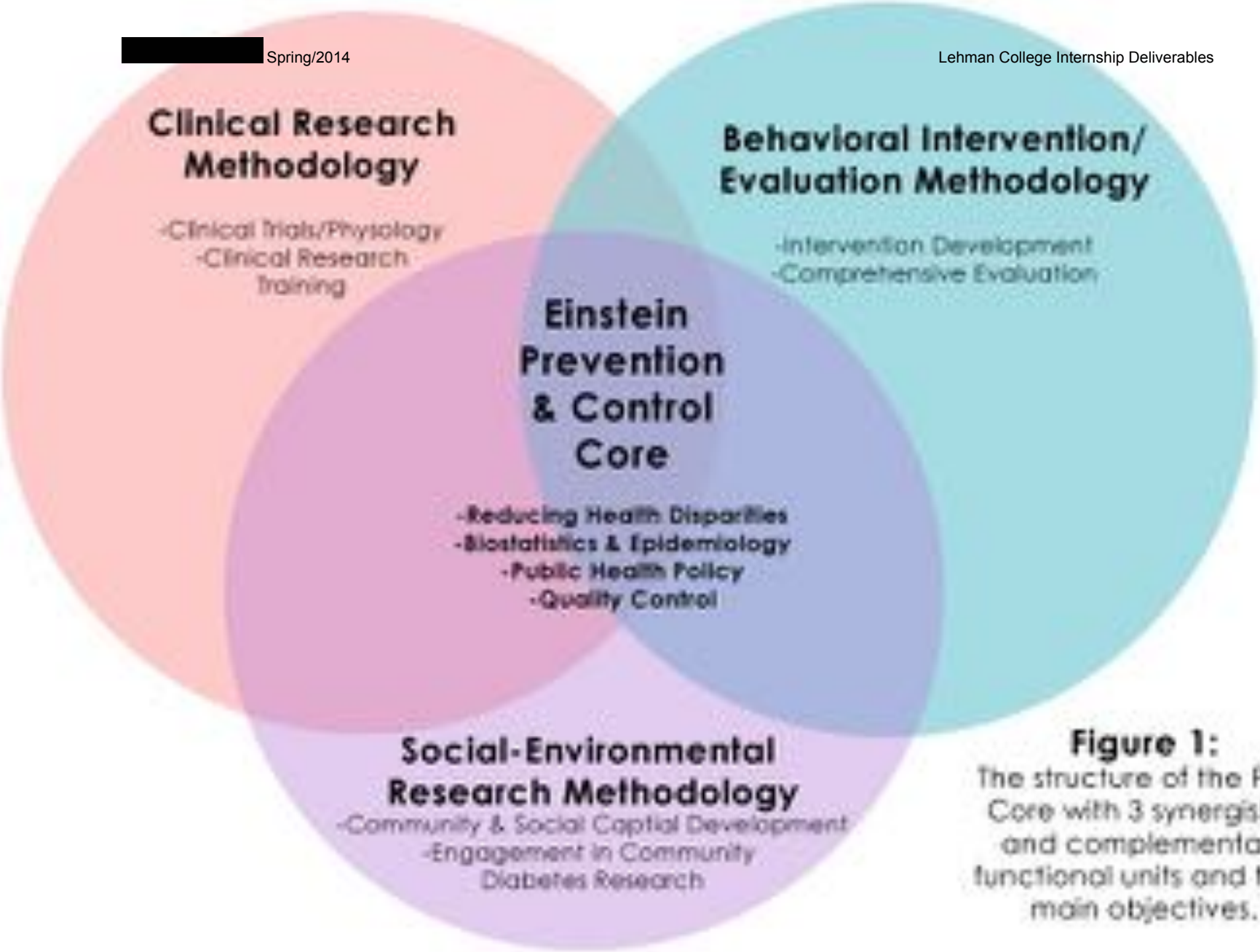


Figure 1:
The structure of the P&C Core with 3 synergistic and complementary functional units and their main objectives.

City University of New York School of Public Health
Lehman College, Department of Health Sciences, MPH Program

STUDENT EVALUATION OF INTERNSHIP EXPERIENCE FORM

Please provide an honest assessment of your internship experience. Your responses will not be shared with anyone from the internship site.

1. **Student's name:** [redacted]
2. **Title of internship project:** Autophagy and Metabolomic Regulation in Aging
3. **Date of this form:** 06/06/2014
4. **Internship start & completion dates:** February 18, 2014 to June 6, 2014
5. **Preceptor's name & title:** Rajat Singh, MD/Assistant Professor of Medicine and Molecular Pharmacology
6. **Agency name and borough:** Albert Einstein College of Medicine/Bronx
7. **Total number of hours completed:** 180 hours
8. **Describe the primary duties for which you were responsible:** My role as an intern in Dr. Singh's lab was to provide essential data from the clinical trials core to support Singh's theory and research. My responsibility was to recruit patients into the clinical physiology research trials in diabetes and metabolism at the Diabetes Research Center. I collected records, review and summarized data from the Prevention and Control core to supplement to support Dr. Singh's research in the Animal Physiology core.
9. **How prepared do you think you are in the following areas as a result of your internship? (Insert an X in the appropriate box for each competency)**

Competency	Very well prepared	Well prepared	Adequately Prepared	Inadequately prepared	Not prepared	Not applicable to my project
Obtaining & using appropriate information from published and unpublished literature	X					
Assessing health problems	X					
Developing health objectives	X					
Using health-related data	X					

Competency	Very well prepared	Well prepared	Adequately Prepared	Inadequately prepared	Not prepared	Not applicable to my project
Planning & developing health programs and projects	X					
Managing health programs	X					
Evaluating health programs	X					
Developing surveys, questionnaires, etc.	X					
Collecting data	X					
Analyzing data	X					
Obtaining relevant information from the Internet	X					
Working collaboratively on a team	X					
Working collaboratively with community representatives & organizations	X					
Conducting meetings	X					
Financial planning & management skills	X					
Leadership skills	X					
Other *(please specify)*						

10. Overall, how would you rate your internship experience?

☒ Excellent ☐ Very good ☐ Good ☐ Fair ☐ Poor

11. Rate the level of guidance/mentoring you feel you received from your preceptor:

☒ Excellent ☐ Very good ☐ Good ☐ Fair ☐ Poor

12. Would you consider working for this agency after you graduate?

☒ Yes ☐ No ☐ Not sure

13. Would you recommend this placement for other students? Why or why not?

I would absolutely recommend this placement for another student because I was able to earn a great deal of experience from the Montefiore Clinic sights.

14. Please provide a brief summary of the most important things you learned from your internship:

Diabetes, its complications, and related endocrine diseases are a major focus of public health concern at the local, national and global levels. The success of Einstein's research programs derives in large part from synergistic interdisciplinary collaborations. I received the most satisfaction out my experience in my internship because I was able to witness and contribute to this form collaboration. From my involvement in the Diabetes Center Conferences to the administration of lab supplies, I was able to play an instrumental part in research and how innovation is created.

15. Please provide any additional comments or suggestions that would help the MPH program improve the internship experience:

No comments

City University of New York School of Public Health
Lehman College, Department of Health Sciences, MPH Program

BASIC FORMAT FOR INTERNSHIP LOGIC MODELS

RESOURCES	ACTIVITIES	OUTPUTS	STUDENT OUTCOMES	IMPACT
-Supervised field experience (180 hours) in an approved public health agency or Community health host organization. -Einstein/Montefiore Institutional Review Board Oversight. -Einstein Diabetes Research Center Core Facilities access and usage. -Dr. Singh's Molecular Biology laboratory research data. -DRC Prevention and Control core research data. -Site Supervisor mentoring and guidance.	-Needs assessment and fact findings related to Diabetes in the Community. -Development of informational pamphlets used to recruit and educate the community about the DRC research. -Development of written reports, summaries and protocols for the P&C and Dr. Singh's research. -Supervise and manage laboratory activities and budgets. -Development of PowerPoint informational materials relating to Diabetes for patients.	-Training materials and PowerPoint presentations. -New Recruitment strategies. -Patient survey questionnaires. -Research data summary. -Clinical trials core summary. -Lab budget expense summary.	-Increased experience in in clinical trials research. -Improved ability to analyze research findings. -Improved managerial skills. -Improved lab management and budgeting skills.	-Improved ability to integrate public health theory with community based training. -Improved communication and professional skills attained from on-site training. -Improved leadership skills and responsibilities for planning and administration of lab activities.

RESOURCES	ACTIVITIES	OUTPUTS	HOST SITE OUTCOMES	IMPACT
-Supervised field experience (180 hours) in an approved public health agency or Community health host organization. -Einstein/Montefiore Institutional Review Board Oversight. -Einstein Diabetes Research Center Core Facilities access and usage. -Dr. Singh's Molecular Biology laboratory research data. -DRC Prevention and Control core research data. -Site Supervisor mentoring and guidance.	-Needs assessment and fact findings related to Diabetes in the Community. - Development of informational pamphlets used to recruit and educate the community about the DRC research. -Development of written reports, summaries and protocols for the P&C and Dr. Singh's research. -Supervise and manage laboratory activities and budgets. -Development of PowerPoint informational materials relating to Diabetes for patients.	-Training materials and PowerPoint presentations. -New Recruitment strategies. -Patient survey questionnaires. -Research data summary. -Clinical trials core summary. -Lab budget expense summary.	-Conduct research that delves into nutrition and biology within a diverse community in order to provide the best possible care in diabetes. -Initiate community relationship among Doctors and patients in order for scientist and researchers to view diabetes through a variation of concepts and theories that provide patients with new measures in diabetic care. -Empower the community with information that will enable them to make healthy choices in their lives with regards to nutrition, obesity, and diabetes.	-Conduct research that can develop new therapies for prevention & treatment of Diabetes. -Development of procedures for planning, implementation and evaluation of Diabetes health programs, policies and interventions within act risk communities. -Provide strong leadership for creative basic and translational research related Diabetes and its complications for the underserved populations among the 1.4 million residents of the Bronx, and the 6.9 million residents of the other boroughs comprising New York City.

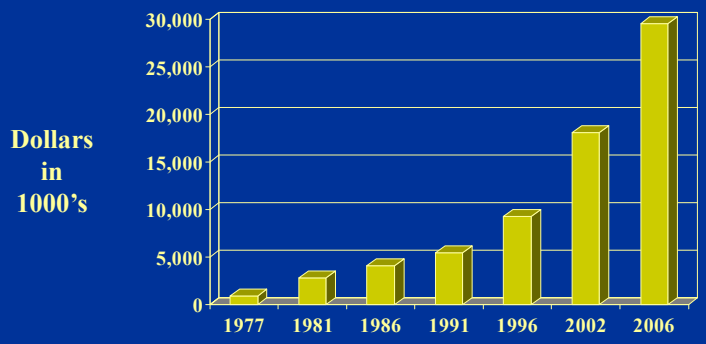
EINSTEIN DIABETES CENTER

- 1973 -NATIONAL DIABETES COMMISSION
- 1977- SUCCESSFUL APPLICATION FOR DRTC
- 1988- DIABETES RESEARCH CENTER
- 1990- CLINICAL DIABETES PROGRAM
- 2005- NEW DEAN AND NEW STRATEGIC PLAN
- 2009-RENEWAL APPLICATION SCORE 14 (10-90)

EINSTEIN DRTC

- SCIENTIFIC BASE
- BIOMEDICAL CORES
  - Hormone Assay — Norman Fleischer
  - Animal Physiology — Nir Barzilai
  - Metabolomics — Irwin Kurland
  - Flow Cytometry — Steve Porcelli
  - Epigenetics — John Greeley
  - Analytical Imaging — John Condeelis
- PREVENTION AND CONTROL — Elizabeth Walker
  - Clinical Research Facilitation Core — Harry Shamoon
  - Translation Effectiveness Core — Judith Wylie-Rosett
- FEASIBILITY STUDIES
- ADMINISTRATIVE CORE

DIABETES RELATED RESEARCH SUPPORT (direct cost)



EINSTEIN DRTC RECRUITMENT

- DENNIS SHIELDS 1978
- HARRY SHAMOON 1980
- MICHAEL BROWNLEE 1987
- SHIMON EFRAT 1988
- ELIZABETH WALKER 1990
- CHARLES BASCH 1990
- MAUREEN CHARRON 1990
- LUCIANO ROSSETTI 1991
- JONATHAN BACKER 1992
- NIR BARZILAI 1993
- ZHONG-YIN ZANG 1994
- DAVID LAWRENCE 1996
- PETER ARVAN 1996
- REGINA KULIAWAT 1996
- MICHAEL LISANTI 1997
- PHILIP SCHERER 1997
- MEREDITH HAWKINS 1998
- DANIEL STEIN 1998
- SILVANA OBICI 2000
- TERESA DILORENZO 2001
- JILL CRANDALL 2002
- GARY SCHWARTZ 2003
- ANTONIO AZZARO 2003
- RITA LOUARD 2004

DRTC RESEARCH AREAS

- Islet, Biochemistry, Biology & Immunology
- Signal Transduction
- Carbohydrate and Lipid
- Clinical Physiology and Trials
- Behavioral & Social Determinants of Health and Health Disparities
- Complications

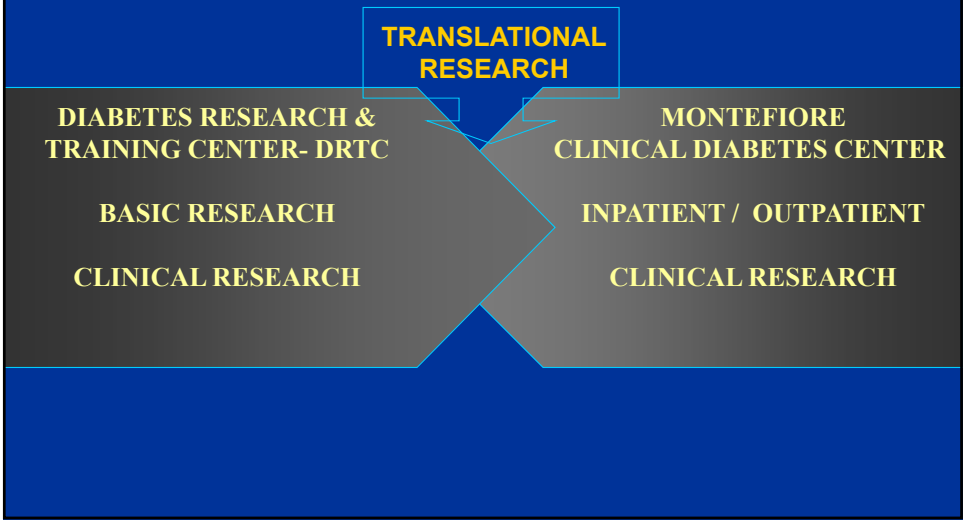
EINSTEIN DRTC ACCOMPLISHMENTS

- **SIGNAL TRANSDUCTION THROUGH PROTEIN PHOSPHORYLATION**. Ora Rosen, Charles Rubin, Richard Stanley, Jonathan Backer, David Lawrence, Michael Lisanti, Zhong-Yin Zhang
- **GENERATION OF TRANSFORMED BETA CELL LINES FOR THERAPY OF DIABETES.**. Shimon Efrat, Sanjeev Gupta and Norman Fleischer
- **THE PATHOGENESIS OF DIABETIC COMPLICATIONS.** Michael Brownlee (1993 Lilly Award, Claude Bernasrd Award, the Banting Metal)
- **NUTRIENT SENSING: DIALOG BETWEEN THE BRAIN AND THE PERIPHERY**. Luciano Rossetti (2000 Lilly Award)
- **PROMOTING RETINOPATHY SCREENING IN UNDERSERVED POPULATIONS BY TELEPHONE SCREENING.** Elizabeth Walker and Charles Basch

EINSTEIN DIABETES CENTER

- DIABETES RELATED RESEARCH
- DIABETES CLINICAL TRIAL UNIT
- MONTEFIORE-EINSTEIN CLINICAL CENTER

DIABETES



Diabetes Research & Translation

Discovery of a novel receptor

↓

Decrease or ablate its level in cells

↓

Decrease or ablate its level in animals

↓

Develop modulators of its activity

↓

Test the effect of modulators in humans

↓

Treat or Cure metabolic disease

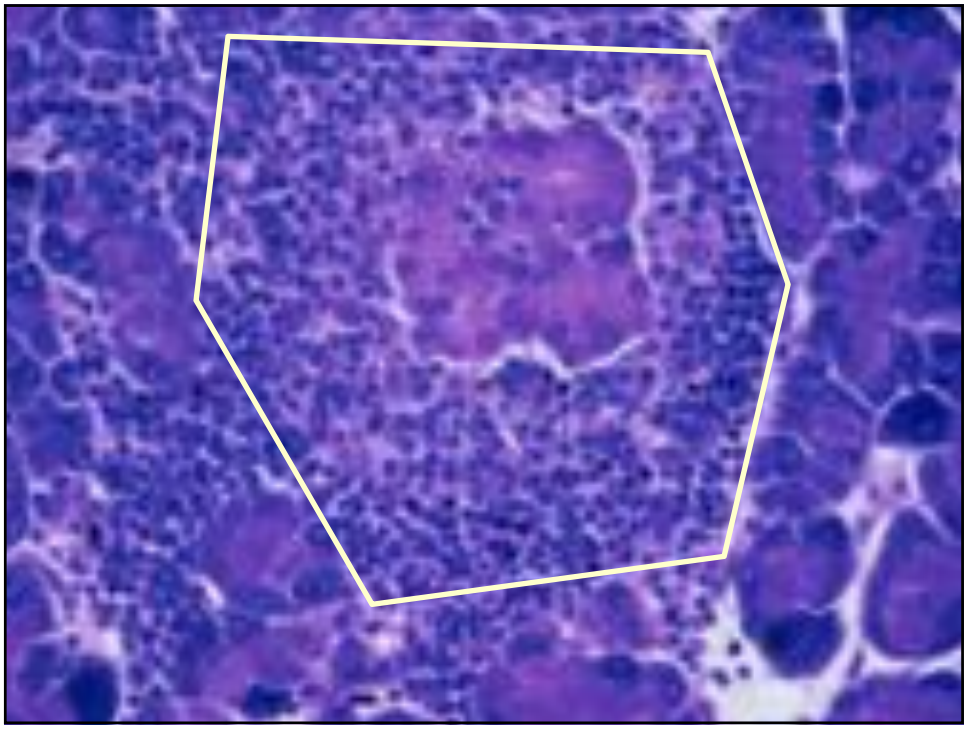
DIABETES

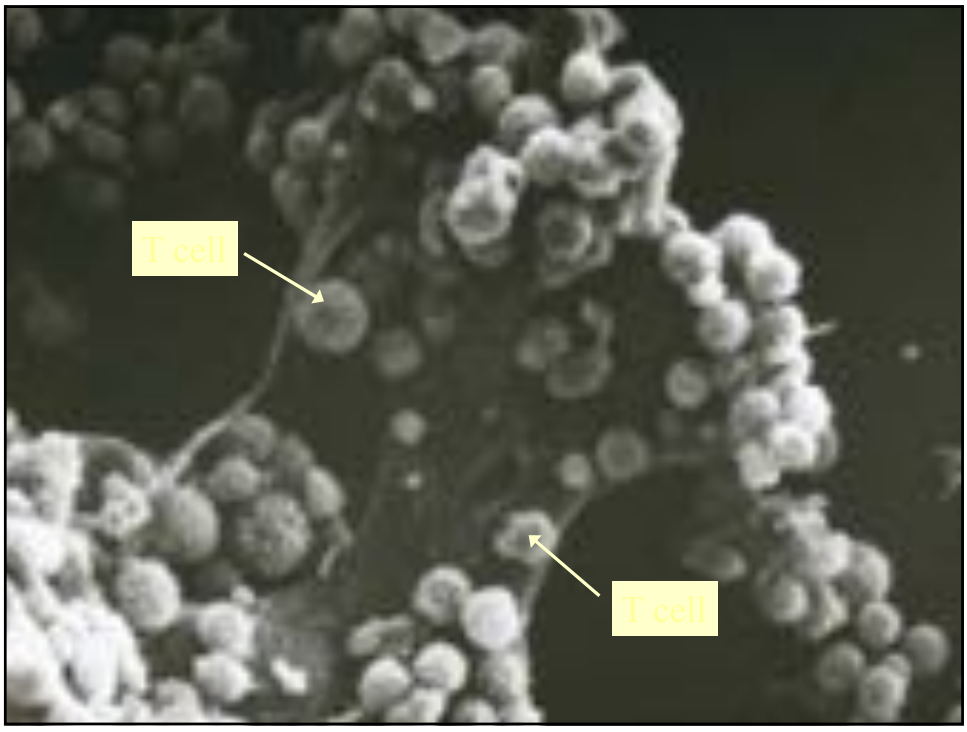
TYPE 1

- Occurs at any age but usually in youth (Juvenile)
- Autoimmune destruction of beta cells
- 50%concordance in identical twins
- Insulin dependent
  - Insulin action is normal
  - Very insulin deficient
  - Therefore, insulin therapy
- 5 to 10% of patients

TYPE 2

- Higher incidence in aging
- Complex etiology
  - Insulin resistance
  - Decreased insulin production
  - Associated with obesity
- 100% concordance in identical twins
- Multiple treatments
  - Oral agents useful
  - Insulin therapy sometimes
- 90 to 95% of patients




T cell
T cell

DIABETES

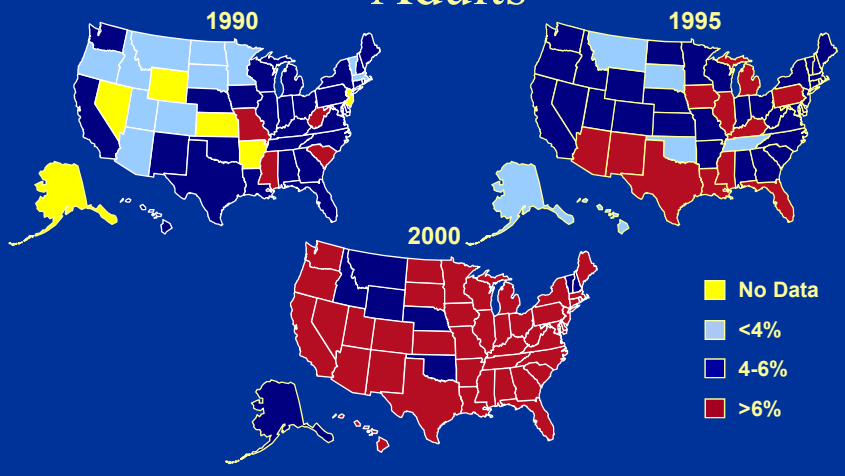
TYPE 1

- Occurs at any age but usually in youth (Juvenile)
- Autoimmune destruction of beta cells
- 50%concordance in identical twins
- Insulin dependent
  - Insulin action is normal
  - Very insulin deficient
  - Therefore, insulin therapy
- 5 to 10% of patients

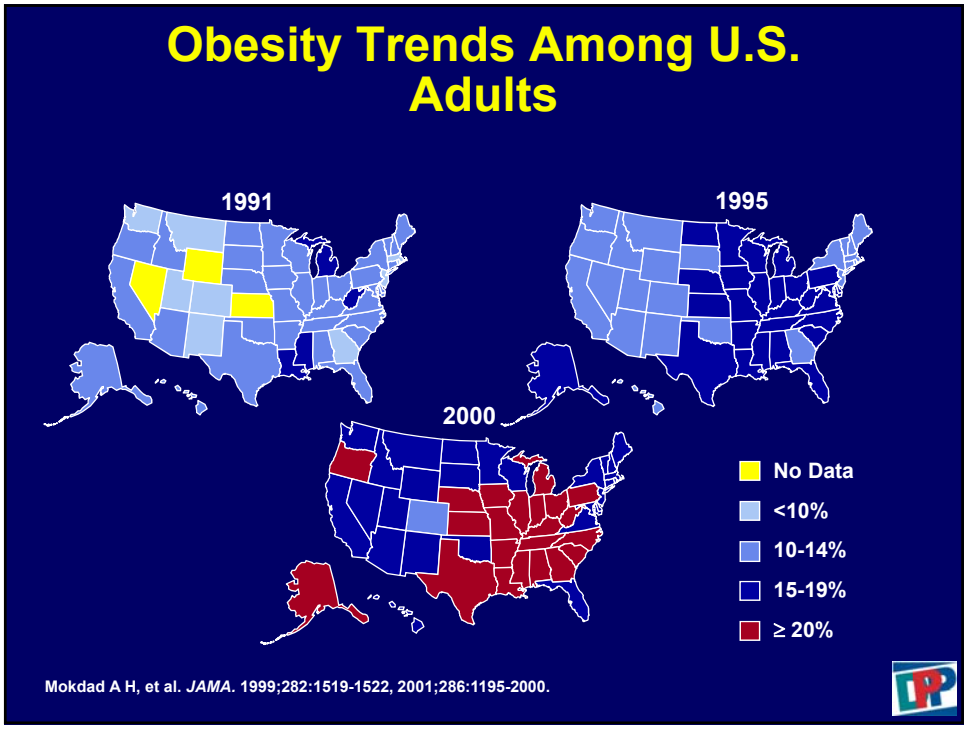
TYPE 2

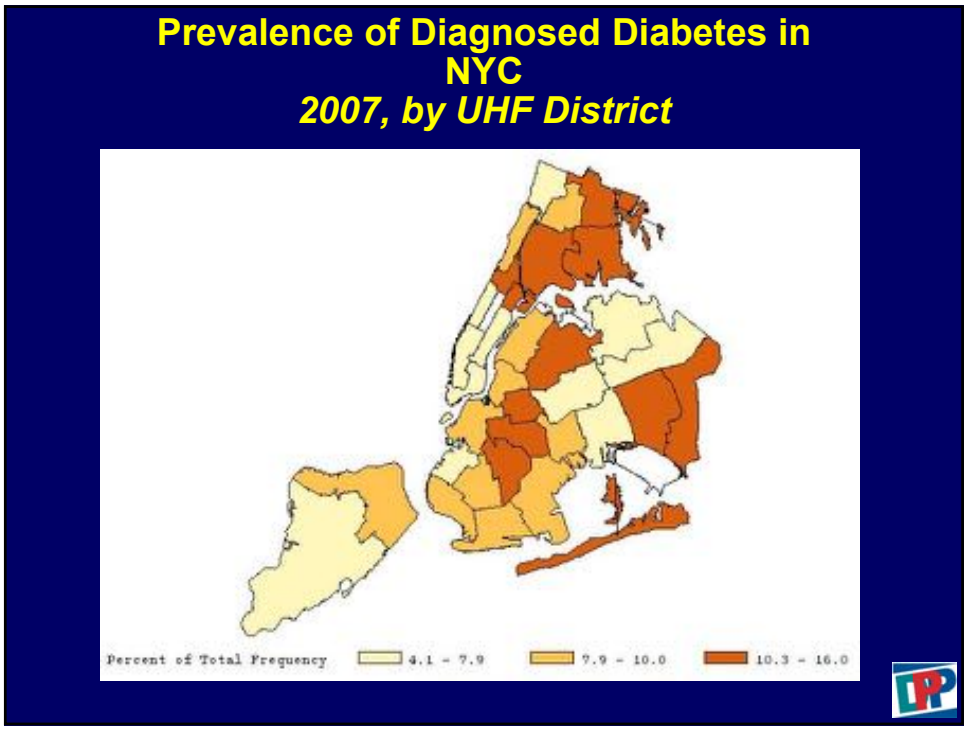
- Higher incidence in aging
- Complex etiology
  - Insulin resistance
  - Decreased insulin production
  - Associated with obesity
- 100% concordance in identical twins
- Multiple treatments
  - Oral agents useful
  - Insulin therapy sometimes
- 90 to 95% of patients

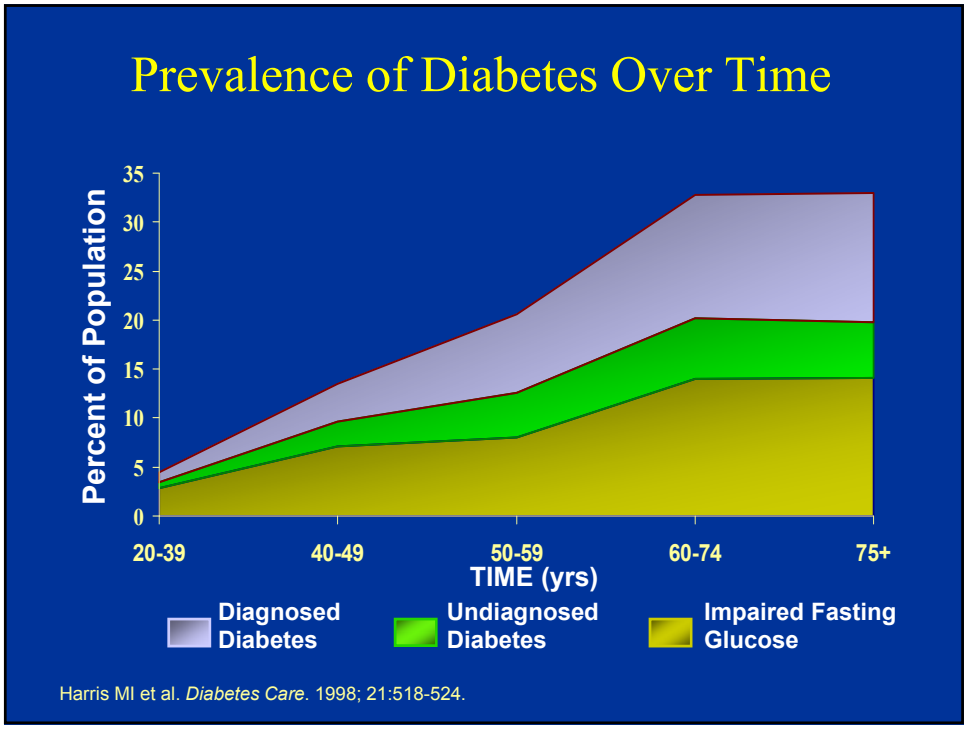
Diabetes Trends Among U.S. Adults

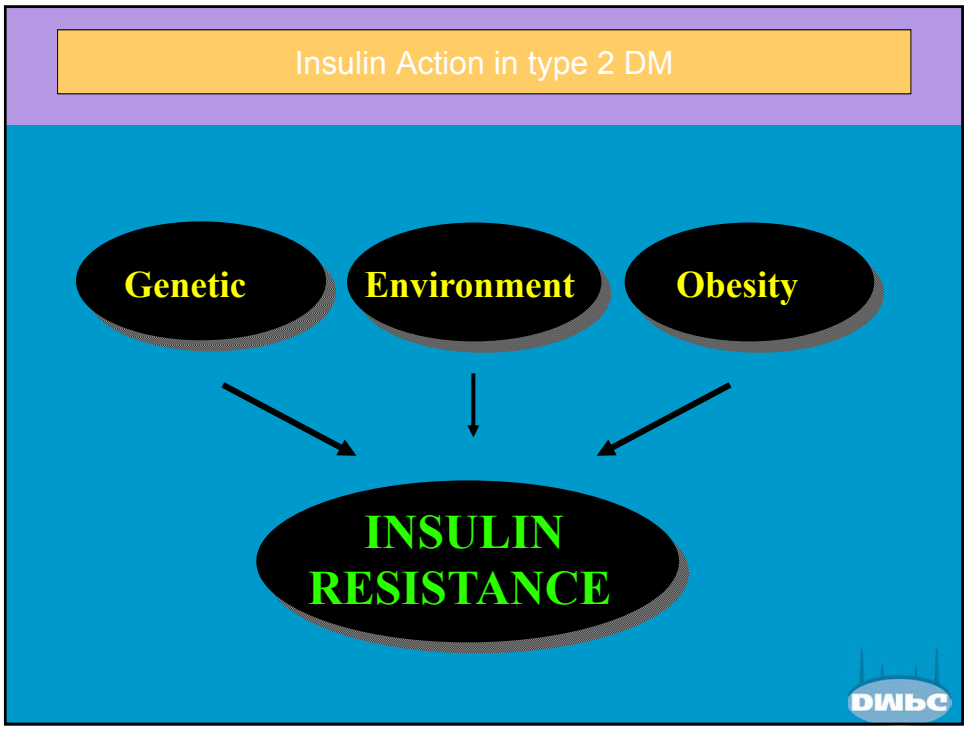


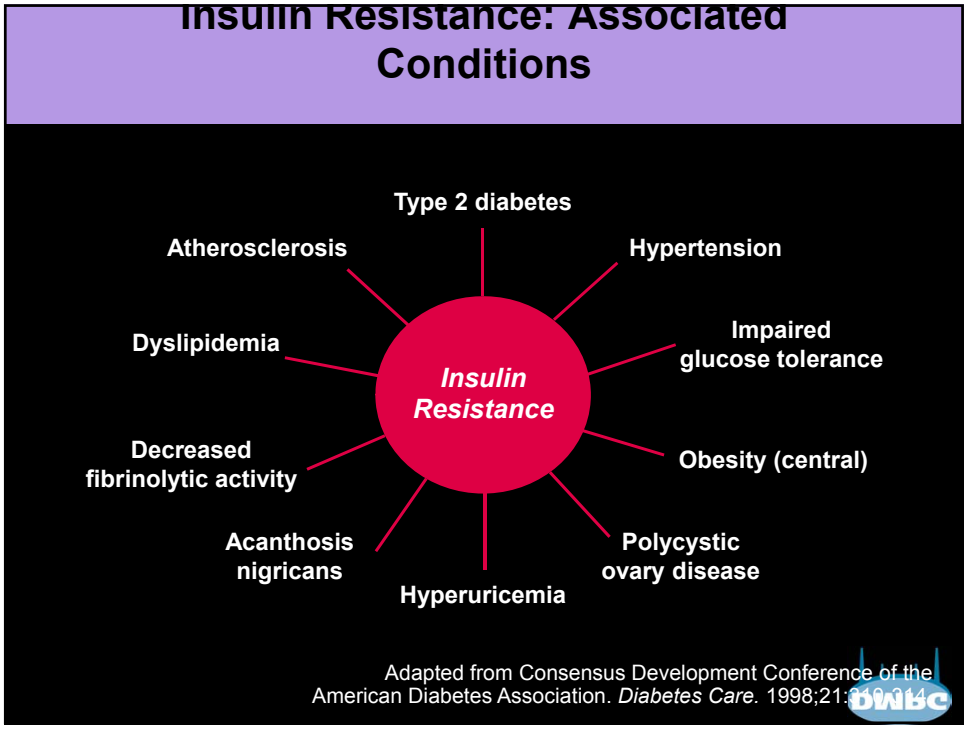
http://www.cdc.gov/diabetes/pubs/glancemaps1.htm


Obesity Trends Among U.S. Adults
1991
1995
2000
No Data
<10%
10-14%
15-19%
≥ 20%
Mokdad A H, et al. JAMA. 1999;282:1519-1522, 2001;286:1195-2000.


Prevalence of Diagnosed Diabetes in NYC
2007, by UHF District
Percent of Total Frequency
4.1 - 7.9
7.9 - 10.0
10.3 - 16.0


Prevalence of Diabetes Over Time
Percent of Population
35
30
25
20
15
10
5
0
20-39
40-49
50-59
60-74
75+
TIME (yrs)
Diagnosed Diabetes
Undiagnosed Diabetes
Impaired Fasting Glucose
Harris MI et al. Diabetes Care. 1998; 21:518-524.


Insulin Action in type 2 DM
Genetic
Environment
Obesity
INSULIN RESISTANCE
DWbC


Insulin Resistance: Associated Conditions
Type 2 diabetes
Atherosclerosis
Hypertension
Dyslipidemia
Impaired glucose tolerance
Insulin Resistance
Decreased fibrinolytic activity
Obesity (central)
Acanthosis nigricans
Polycystic ovary disease
Hyperuricemia
Adapted from Consensus Development Conference of the American Diabetes Association. Diabetes Care. 1998;21:310-314.



What is the GRADE study?

The goal of the GRADE study is to try to determine which combination of diabetes medications best controls blood sugar levels, has the few side effects and benefits overall health.

Why should I participate?

Many of us have family and friends who have diabetes. By participating in this study, you would be helping us to help others by improving how diabetes is treated.

Can I be included in this study?

You may be eligible, if you are:

- An adult with diabetes for less than 10 years
- Only taking metformin for your diabetes
- Are willing to take a second diabetes medication if needed.
- Speak and read in English or Spanish

What are the benefits?

Participants will receive:

- Diabetes medications and supplies provided at no cost
- Diabetes care visits and lab test at no cost
- Annual diabetes education at no cost
- Help to better control blood sugar levels.



What do I have to do?

- You will have 4 visits per year with the GRADE study team.
- You will be in the study for up to 7 years.
- You will continue to take the diabetes medicines that GRADE provides to you, while you are in the study.

The study visits will take place at Montefiore/Einstein Clinical Research Center.

Recruitment Updates and Summarization:

Over the past 4 months (since February 2014), we have been actively recruiting and studying subjects. Table 1 details recruitment data from February, 2014 to June, 2014 for this arm of the protocol. Nine subjects have been enrolled in the first arm of this protocol thus far, and have completed at least 1 hypoglycemic study.

Completed phone screenings	Phone screenings eligible for clinical visit	Subjects who completed clinical screening visit	Eligible subjects after clinical screening	Percentage of clinically eligible subjects who are enrolled
38	30	25	17	52.9%

TABLE 1.

Summary of Results:

While intensive glycemic control improves outcomes in type 1 diabetes mellitus (T1DM), hypoglycemia limits its attainment. Indeed, insulin therapy for T1DM that attempts at tight glycemic control often results in recurrent hypoglycemia. Such recurrent hypoglycemic episodes ultimately cause blunted counter-regulatory responses, culminating in hypoglycemia-associated autonomic failure (HAAF), defined by impaired counter-regulatory hormone responses to hypoglycemia and hypoglycemia unawareness, with potentially detrimental clinical outcomes.

Of note, hypoglycemia counter-regulation is associated with release of endogenous opioids, and therefore progressive tolerance to these factors may cause HAAF. Physiologic stressors known to induce the release of endogenous opioids, including exercise, have been shown to blunt counter-regulatory responses during subsequent hypoglycemia, thereby contributing to the pathogenesis of HAAF (*JCEM* 97: 623-631, 2012). Importantly, the onset of HAAF can be *prevented* in non-diabetic subjects by opioid receptor blockade with naloxone during antecedent hypoglycemia (*JCEM* 94: 3372-3380, 2009). Additionally, HAAF can be ameliorated in T1DM by administration of naloxone during antecedent hypoglycemia. Together, this supports the hypothesis that the endogenous opiate system contributes importantly to the development of HAAF in patients with T1DM (*Diabetes* 59: Supplement, 2010).

In order to examine the impact of opioid receptor activation on both biochemical and clinical responses to hypoglycemia, we examined counter-regulatory responses to hypoglycemia following morphine infusion in non-diabetic subjects.

Seven healthy subjects (4 males, age 33.4 ± 3.5 yr, BMI 23.9 ± 1.2 kg/m2) participated in two study protocols in random order over two consecutive days. On Day 1, subjects underwent two 120-minute infusions of either saline or morphine (0.1μg/kg/min), separated by a 120-minute break (with euglycemic nonclamped conditions throughout). On day 2, subjects underwent stepped hypoglycemic clamp studies (glucose nadir of ~60mg/dL) with evaluation of counter-regulatory hormone responses as well as endogenous glucose production (EGP, using 6,6-D2-glucose), and hypoglycemic symptoms (based on a standardized score). Plasma glucose target levels were attained in all subjects and were similar between study conditions (**Figure 1**).

Compared with saline infusion studies, infusion of morphine induced a blunted epinephrine response to hypoglycemia (**Figure 2**: saline= 554 ± 16 vs. morphine= 287 ± 37 pg/mL, p=0.006). This was associated with a 17.4% lower rate of EGP (p=0.03), as well as fewer hypoglycemia-associated headaches (p=0.02). Thus, antecedent morphine infusion significantly impacted counter-regulatory responses to hypoglycemia in healthy, non-diabetic subjects.

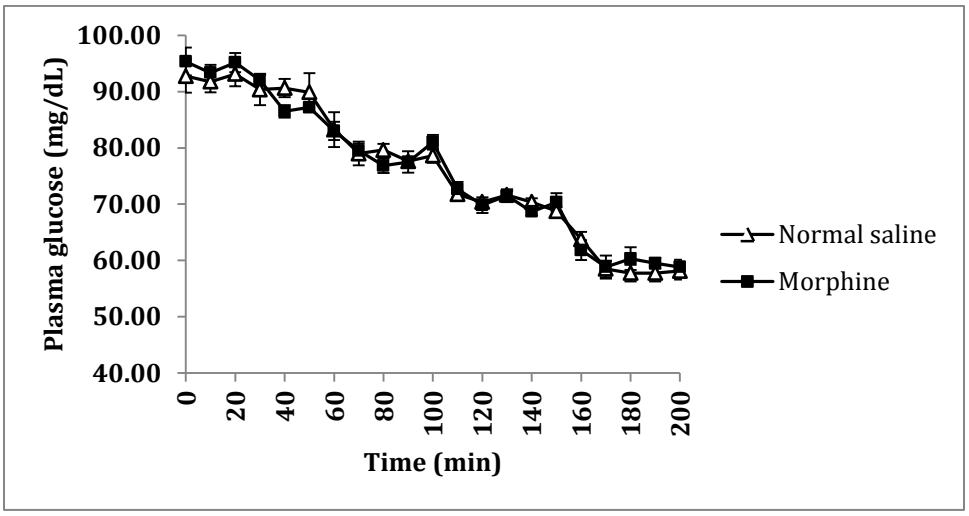


Figure 1. Plasma glucose levels at each successive glucose step during hypoglycemic clamp.

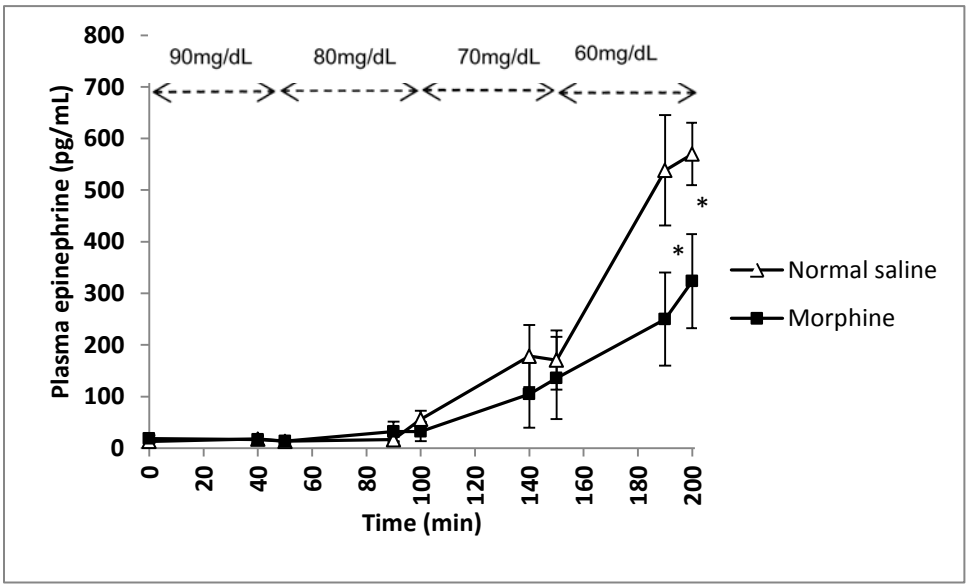


Figure 2. Plasma epinephrine levels at each successive glucose step during hypoglycemic clamp.

Significance:

These findings demonstrate that opioid receptor activation induces hypoglycemia-associated autonomic failure. Thus, opioid receptor blockade may represent an important tool for preventing HAAF, thereby suggesting novel pharmacologic approaches for safer intensive glycemic control in T1DM.

SIRT1 is an NAD^+-dependent deacetylase that has been found to be important in several metabolic processes including the regulation of glucose homeostasis, adipogenesis and mitochondrial function and lifespan extension. Our ongoing studies have primarily focused on the role of hypothalamic SIRT1 in the regulation of glucose homeostasis in an aging rodent model. We have also embarked on further investigation of the role of endogenous SIRT1 regulators in metabolism.

RESULTS

Basic Metabolic Profiling of F1 hybrid Fischer 344 X Brown Norway Rats

For these studies we elected to use the F1 hybrid Fischer 344 x Brown Norway (F344BN) male rats. These rats are known for their exceptional longevity while also exhibiting some of the same phonotypic features seen in human aging such as increased adiposity and insulin resistance. We examined animals across three age groups: 3 month (3M) young; 10 month (10M) middle-aged and 20 month (20M) old. To gain a better understanding of this rat model.

Table 1: Characterization of Basic Metabolic Profile of the F1

Hybrid Fischer Brown Norway Rats

Baseline Parameters	3M	10M	20M
Body Weight (gm)	305.17±3.53	445.6±10.4*	545.1±12.42*
Food Intake (gm)	17±1.3	19±0.8	
Fat Mass(gm)	32.85±0.37	78.62±3.85*	144.34±6.15*
Fat Mass(%)	10.77±1.79	17.5±2.93*	
Glucose (mg/dl)	140±2.72	153±1.15*	
Insulin (ng/ml)	1.29±0.17	2.53±0.22*	
FFA (mEq/L)	1.20±0.13	1.43±0.26	
Adiponectin	4.91±0.23	NA	2.91*±0.55* (ng/ml)

Of note the fat mass increased significantly with age from ~10% in the young to 26% in the old. We observed a progressive increase in fasting plasma glucose and insulin levels. The free-fatty acid levels also increased slightly. Analysis of common adipokines showed a significant decline in adiponectin levels as illustrated in Table 1. Thus these studies confirm that the F344BN rats become insulin resistant as they age.

3M, 10M and 20M received acute MBH administration of either vehicle (5% DMSO), RSV (200 μM) or the SIRT1 selective agonist SRT1720 (100 μM) during pancreatic clamp studies. In the 3M old rats, treatment with MBH resveratrol and SRT1720 resulted in an ~3-fold increase in the glucose infusion rate (GIR) to maintain euglycemia (DMSO: 2.51 ± 0.48 *vs.* RSV: 7.77±0.39). This was primarily due to a decrease in the hepatic glucose production (DMSO: 7.49 ± 0.64 *vs*.

RSV: 5.96 ± 0.40 *vs*. SRT1720: 5.50 ±0.81) and an increase in glucose uptake (DMSO: 10.29 ± 0.63 vs. RSV: 12.78 ± 0.86 *vs*. 12.3± 0.67) Figure 2. In the 10M old rats, acute MBH resveratrol did not significantly change the glucose infusion rate, hepatic glucose production or glucose uptake. As such in this age group, resveratrol did not confer enhanced insulin sensitivity. However, direct MBH treatment with SRT1720 resulted in a 2-fold increase in the glucose infusion rate (DMSO: 1.99 ± 0.51 *vs*. SRT1720: 4.23 ± 1.005). The increase in GIR was due to increased glucose uptake in muscle (DMSO: 8.49 ± 0.59 *vs*. SRT1720: 11.81 ± 0.31).

There was no significant difference in hepatic glucose production in the treatment group. Similarly in the 20M old rats resveratrol treatment did not alter the GIR, hepatic glucose production or glucose uptake. However, treatment with SRT1720 increased the GIR by 2-fold. The glucose production was not significantly changed (DMSO: 6.09 ± 0.273 *vs*. 5.92 ± 0.50) while the glucose uptake was mildly increased (DMSO: 7.31 ± 0.576 *vs*. 8.64 0.51) as shown in Figure 2. These studies indicate a significant difference in how MBH administration of the known SIRT1 agonists affect whole body insulin production. Resveratrol is effective in the young but loses its effect in the middle-aged and old. SRT1720 is a highly effective insulin sensitizer in the young and maintains some degree of sensitivity even in the old.

Similarly basic metabolic studies failed to show any improvement in glucose handling or insulin sensitivity as would have been expected. Thus we conclude that the SIRT1-lentivirus as designed is not effective to yield SIRT1 overexpression in vivo. We are in the process of designing a new virus with a new construct that we hope will yield better results.

SUMMARY

These studies was carried out to determine if hypothalamic SIRT1 function decreases with age and to ascertain whether this decrease in SIRT1 function may contribute to the insulin resistance that is observed in aging rodent models. We have shown that F344BN rats show marked adiposity and insulin resistance that is evident as early as 10M and that is sustained until old age. Further these studies have revealed that hypothalamic SIRT1 expression and transcription decreases with age. SIRT1 has been shown to decrease under conditions of nutrient excess or insulin resistance and since the MBH is particularly sensitive to nutrient availability or hyper-insulinemia, it is not surprising that SIRT1 expression could be affected under these conditions. The ability of MBH resveratrol to affect insulin sensitivity is significantly impaired in the middle-aged and old animals compared to the young. Acute MBH treatment with SRT1720 was able to enhance insulin action in the middle-aged and old animals primarily by stimulating glucose uptake though this effect was significantly less than what was observed in the young. These studies bring to fore-front the concept that SIRT1 declines with aging and its association with insulin resistance, one of the primary manifestations of the aging process.

Budget Justification

The request of $248,400 is for the purchase of equipment in the first year. This equipment is also focused onto our increased utilization of rodent models to understand the dynamic and integrative physiology of diabetes and disordered metabolism. This equipment will be incorporated into the Animal Physiology Core infrastructure but the request and justification (below) is listed in the Administrative Core budget as per our sponsored programs office.

Currently, The ES-DRC supports 32 Oxymax/CLAMS indirect calorimetry chambers and a single environmental chamber that holds 8 of these Oxymax/CLAMS chambers. Since establishment of the regional ES-DRC these units have been heavily used with a 2-3 month scheduling back-up. In addition, there has been tremendous demand by investigators wishing to perform indirect calorimetry at non-ambient temperatures. Due to the large and continuous increased demand for mouse calorimetry, we are requesting $165,000 for the purchase of an additional Columbus Instruments 8 cage unit Oxymax/CLAMS indirect calorimetry system for the determination of energy expenditure, respiratory exchange rate, activity and food intake. We are also requesting $35,000 for the purchase of a second 8 unit Columbus Instrument environmental chamber to house the Oxymax/CLAMS system in order to perform the indirect calorimetry at defined environmental temperatures.

The BASi instruments Culex® Automated Blood Sampler ($25,000) is specifically designed for the collection of urine, feces, bile from mice that is substantially more difficult than for rats and new bowl cage design over comes many of the previous limitations. Another advantage is that this unit can be used following surgeries (ie: ICV cannula and EU-clamp) such that blood sampling and other manipulations can be simultaneously performed while obtaining urine, feces and bile. This equipment is not available at either Einstein or Montefiore.

We are also requesting funds ($23,400) for the purchase of a VisualSonics mouse EchoCardiogram (MicroScan transducer $19,900 and Mouse Handling (ECG plate) Table ($3,500). This instrument will be used for determining cardiac function in various mouse models, which is particularly important, as cardiovascular risk is the single largest complication for diabetic therapy. Currently, there is no available mouse EchoCardiogram available for ES-DRC investigator use at either Einstein or Mount Sinai.

Supplies:

We are requesting $20,000 for the purchase of paper products, radioisotopes, filters, syringes, needles, plasticware, solvents, buffers, chemical reagents, and calibration solutions required for clamps studies. In addition, these funds will be used for animal purchase and maintenance for a small number of rats and mice required for technique development and quality control of vascular catheters and highly specific parenchymal brain cannulation placement. Although the actual supply costs are significantly higher than those requested, recharge (charge back) fees will be used to recover the additional costs.

We are requesting $200,000 for the support of Pilot & Feasibility grants. These funds will be supplemented with $75,000 ($50,000 Einstein and $25,000 Montefiore) dedicated funds for a total of $275,000 to support an annual steady-state of 7 P&F awards at $39,000 each per year. In addition, institutional resources of up to $10,000/year in each ES-DRC Core will also be made available to all P&F awardees.

Microgrants:

Although administered through the P&F program, we are NOT requesting any NIH funds for microgrant awardees. These funds are provided through separate institutional resources provided to the ES-DRC that are non-overlapping with the institutional support for the P&F program.

Catalytic Seed Grant:

Similar to the microgrant program, we are NOT requesting any NIH funds for the catalytic seed grant awardees. These funds are provided through separate CTSA and institutional resources that are distinct from both the P&F and microgrant programs. This program is supported through the Einstein Institute for Clinical and Translational Research (Einstein CTSA) and ES-DRC members are frequent recipients of this funding (i.e. recent awardees include Drs. Crandall, Rastogi and Zang).

[redacted] Spring/2014

Lehman College Internship Deliverables

EINSTEIN
Albert Einstein College of Medicine
OF YESHIVA UNIVERSITY

Science at the heart of medicine

Barbara A. Levy
Assistant Dean
Office of Academic Affairs

Jack & Pearl Resnick Campus
1300 Morris Park Ave ,
Belfer Building, Room 307
Bronx, NY 10461
718.430-221[redacted] fax 718.430-8714
Barbara.levy@einstein.yu.edu

TO: [redacted]
Research Administrator
Department of Medicine
Albert Einstein College of Medicine

FROM: Barbara A. Levy
Assistant Dean for Academic Affairs

DATE: April 9, 2013

SUBJECT: Completion of Collaborative IRB Training Initiative (CITI) Program

This is to confirm that your Collaborative IRB Training Initiative (CITI) Program completion status has been recertified through **April 2, 2018.** CITI is required by AECOM as part of your 'Protection of Human Subjects in Research' education. This web-based program is multi-modular and includes information on the history, regulations, policies, procedures, and ethical principles that pertain to research involving human subjects.

Please retain this letter of certification for your records. It will be required for inclusion in NIH grant applications, and as other regulations are promulgated, may be required by other agencies, as well.

Thank you for your participation in this educational program.

CC: Joan Cardell, Administrator

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771 772/773 Date: 4/27/15

Semester: _Spring 2015

Name of Preceptor: ___Charulata J. Sabharwal

Agency/Organization: _NYC Department of Health and Mental Hygiene

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	7
2.	Motivation	7
3.	Self-directed resourcefulness	7
4.	Value of the contributions to the Agency	7
5.	Reliability/adherence to promised schedules	8
6.	Interpersonal skills	7
7.	Overall rating	7

Total number of Agency clinical hours completed: 142.5

Preceptor's comments on particular areas of student growth and performance:

Ms. [redacted] worked with me for a brief amount of time due as I will be leaving the NYC Department of Health and Mental Hygiene effective April 30, 2015. In this short time, we reviewed the operations of the agency, bureau, program, and unit during her first month with me. During our second month, Ms. [redacted] attended various lectures and seminars which she reported back to me what she had gained from those. In the final weeks, she had started working on a small project to modify critical presentations. Ms. [redacted] has great potential but must ensure that she is clear about the task at hand and would benefit from close supervision. Due to my impending departure, we did not have an further opportunities to work on any further projects. As always, it was a pleasure serving as her supervisor despite the short time period.

[redacted] 4/27/2015

Signature of Agency Preceptor Date

Student Comments:

[redacted] 5/5/2015

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 25 (conferences, CE, etc.)

Total Number of clinical hours completed: 142.5 (167 hours required)

Grade in clinical portion of course: Pass ✓ Fail _____

Lauren Liess Lauren Liess 5/19/15

Signature of Seminar Instructor Date

EPIDEMIOLOGY/BIOSTATISTICS
Fieldwork Preceptor Evaluation Form

Student: [redacted]
Name of Agency: NYC Dep't of Health and Mental Hygiene

Site Supervisor: **Amanda Schneider**
Dates of placement: 1/13/15 - 5/31/15

	Please check one but in each row				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works		X			
b) Public health principles and concepts		X			
2. Skills in:					
a) Planning		X			
b) Implementation		X			
c) Organizing		X			
d) Program analysis and evaluation					X
e) Writing		X			
f) Verbal communication	X				
g) Data manipulation/analysis	X				
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers	X				
2. Organizes and uses time effectively			X		
3. Considers and incorporates the ideas of others	X				
4. Is able to facilitate work of committees and other groups					X
5. Submits accurate, well documented work and reports	X				
6. Accepts responsibility and completes work assignments	X				
7. Raises innovative ideas and brings out creative and innovative ideas in others	X				

COMMENTS (Please respond briefly. Use reverse side if necessary)

1. Special strengths:

All of [redacted] work has been excellent technically and aesthetically. I have been extremely impressed with the accuracy, thoroughness, and overall quality of his work. He has shown great initiative, creativity, and general ability to get things done well.

2. Skills and knowledge needing further improvement:

[redacted] is working on getting to work on time and better organizing his time while here. This has improved, but still needs further work. He needs to work on prioritizing tasks and focusing on end goals.

3. Other comments:

I have really appreciated having [redacted] on the team this spring and look forward to continuing to work with him over the summer.

Site Supervisor's Signature _____ **Date**: 5/21/15

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

SM Brown

of 2002

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 5/19/15

Semester: ~~Fall 2014~~ Spring 2015

Name of Preceptor: Tonya Brown

Agency/Organization: Edwin Gould Services

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	9
2.	Motivation	10
3.	Self-directed resourcefulness	10
4.	Value of the contributions to the Agency	9
5.	Reliability/adherence to promised schedules	9
6.	Interpersonal skills	9
7.	Overall rating	9

Total number of Agency clinical hours completed: 167

SMBrown

Preceptor's comments on particular areas of student growth and performance:

[redacted] showed great motivation and initiative to experience foster care in its totality. It was a pleasure to see her interest in the complex system within a larger more globally complex system at large. She has excellent insight for community health issues & needs.

Signature of Agency Preceptor — Date: 5/19/15

Student Comments:

[redacted] — Date: 5-19-15

Signature of Student

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: _____ (conferences, CE, etc.)

Total Number of clinical hours completed: _____ (167 hours required)

Grade in clinical portion of course: Pass _____ Fail _____

Signature of Seminar Instructor — Date

Preceptor's Evaluation Form
Hunter College Environmental and Occupational Health Sciences Program
CUNY School of Public Health

Student: [redacted] Site Supervisor: Frank Marino

Name of Organization: ERS Corp Dates of placement: 1/5/15 - 3/5/15

Please check one box in each row

	Excellent (performs on highly professional level)	Above average	Average (needs to improve)	Below average	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of: a) Technical & political climate within which organization works			✓		
b) Environmental and occupational health principles and concepts			✓		
c) Legal and regulatory environment					
2. Skills in: a) Planning					
b) Implementation					✓
c) Exposure assessment					✓
d) Program analysis and evaluation					
e) Written communication				✓	
f) Verbal communication				✓	
g) Data evaluation and analysis					✓
h) Training and education					✓
i) Hazard evaluation and abatement					✓
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.			✓		
2. Organizes and uses time effectively.			✓		
3. Considers and incorporates the ideas of others					✓
4. Is able to facilitate work of committees and other groups.					✓
5. Submits accurate, well documented work and reports.			✓		
6. Accepts responsibility and completes work assignments			✓		
7. Raises innovative ideas and brings out creative and innovative ideas in others					✓

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:

2. Skills and knowledge needing further improvement:
Needs better communication skills overall.

3. Other comments:

Site Supervisor's Signature [signature] **Date:** 5/21/15

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 772/773 Date: 5/12/15

Semester: Spring 2015

Name of Preceptor: Denise Pfohe

Agency/Organization: NYC DOHMH

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	8
3.	Self-directed resourcefulness	9
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	9
6.	Interpersonal skills	9
7.	Overall rating	9

Total number of Agency clinical hours completed: * 167.5

Preceptor's comments on particular areas of student growth and performance:

[redacted] has worked with us on several projects, including abstraction of overdose reality files and a summary of reports focused on alcohol policy in College Communities. [redacted] did a great job with distilling the alcohol reports & translating findings into a power point. She did an excellent job presenting the findings to staff. The work is very valuable to our bureau & we look forward to her continuing in the fall.

[signature] 5/15/15

Signature of Agency Preceptor Date

Student Comments: My first semester at the Department of Health has certainly been a great learning experience. I was given several opportunities to work on several projects the BADUPCT bureau is involved in. Denise has been a great preceptor and her staff was supportive of my efforts.

[redacted] 5/15/15

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 8.5
(conferences, CE, etc.)

Total Number of clinical hours completed: 159
(167 hours required)

Grade in clinical portion of course: Pass ✓ Fail _____

[signature] 5/19/15

Signature of Seminar Instructor Date

Time Log for Non-Direct Care Clinical Placements	Time Log for N771 Agency Clinical Hours
0	10
0	10
0	11.5
0	11
0	11
0	0
0	11
0	10
0	10
0	10
0	11.5
0	13.5
0	10.5
0	14
0	5
0	5
0	5
0	**159**

DATE RANGE - All

COURSE - All

This report shows your daily time logs, most recent first, formatted in **hours**.

Date	Course	Shift/On-Call Time	Formal Preceptor Consultation
5/15/2015	771-Community/Public Heal...	0	0
5/8/2015	771-Community/Public Heal...	0	0
5/1/2015	771-Community/Public Heal...	0	0
4/24/2015	771-Community/Public Heal...	0	0
4/17/2015	771-Community/Public Heal...	0	0
4/13/2015	771-Community/Public Heal...	0	0
4/3/2015	771-Community/Public Heal...	0	0
3/27/2015	771-Community/Public Heal...	0	0
3/20/2015	771-Community/Public Heal...	0	0
3/13/2015	771-Community/Public Heal...	0	0
3/3/2015	771-Community/Public Heal...	0	0
2/27/2015	771-Community/Public Heal...	0	0
2/20/2015	771-Community/Public Heal...	0	0
2/13/2015	771-Community/Public Heal...	0	0
2/6/2015	771-Community/Public Heal...	0	0
2/3/2015	771-Community/Public Heal...	0	0
1/30/2015	771-Community/Public Heal...	0	0
Totals		**0**	**0**

Time Log for N771 Non-Agency Clinical Hours	Time Log for Agency Clinical Hours
0	0
0	0
0	0
0	0
0	0
8.5	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
8.5	**0**

***Report generated 5/15/2(

Time Log for Non-Agency Clinical Hours	Time Log for Webinar Hours
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	**0**

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Preceptor's Evaluation Form
Hunter College Environmental and Occupational Health Sciences Program
CUNY School of Public Health

Student: Site Supervisor: Elizabeth Geltman

Name of Organization: CUNY School of Public Health – Hunter Dates of placement: January 2015 – May 2015

	Please check one box in each row.				
	Excellent (performs on highly professional level)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of: a) Technical & political climate within which organization works	X				
b) Environmental and occupational health principles and concepts	X				
c) Legal and regulatory environment	X				
2. Skills in: a) Planning	X				
b) Implementation	X				
c) Exposure assessment	X				
d) Program analysis and evaluation	X				
e) Written communication	X				
f) Verbal communication	X				
g) Data evaluation and analysis	X				
h) Training and education	X				
i) Hazard evaluation and abatement					
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.	X				
2. Organizes and uses time effectively.	X				
3. Considers and incorporates the ideas of others	X				
4. Is able to facilitate work of committees and other groups.	X				
5. Submits accurate, well documented work and reports.	X				
6. Accepts responsibility and completes work assignments	X				
7. Raises innovative ideas and brings out creative and innovative ideas in others	X				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:

2. Skills and knowledge needing further improvement:.

3. Other comments:

Site Supervisor's Signature_____s/ Elizabeth Glass Geltman_____ **Date**: 5/18/15_____

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:
Brian Pavilonis

bp305@hunter.cuny.edu

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Dr. Adinah	Sup Last Name:	Pelman
Organization:	Union Plaza Care Center		

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Very good
Uses time effectively	Excellent
Reliably completes tasks on time	Very good
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Very good

B) Work Attitudes

Accepts responsibilities	Very good
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Very good
Graciously accepts ideas and suggestions	Very good
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Very good
Supervisor	Excellent
Personnel from other organizations	N/A
Clientele	N/A
General public	N/A

D) Application of community Health Skills

Assessing health problems	Very good
Developing health objectives	Very good
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	Good
Compiling health data/statistics	N/A
Facilitating group process	Very good

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Very good

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	Innate ability to understand and identify potential problems. Continuing attention to detail.
What are the areas needing improvement?	Could take more initiative on projects.
Other comments regarding the intern:	Overall excellent experience. Would recommend as an employee.

Future Opportunities

Would you be willing to take another student next semester?	No

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Jean	Sup Last Name:	Grassman
Organization:	Capracare		

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Very good
Effectiveness in written communication	Very good
Effectiveness in oral communication	Very good
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Very good
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	Excellent
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	Excellent
General public	Excellent

D) Application of community Health Skills

Assessing health problems	Excellent
Developing health objectives	Very good
Planning health programs/projects	Very good
Implementing programs/projects	Very good
Evaluating programs/projects	N/A
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	Excellent

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	K came to this internship with an interest in infectious vector-borne diseases. Her responsibilities consisted of putting together a plan for surveillance of mosquito habitat. Once we started, she worked with me to document the sites via GPS, working with N to find people to interview, and photographing the sites. She then compiled these materials for further analysis. K was a resilient in conditions that were hot, insect ridden, and lacking in amenities. Despite the discomfort, she was intellectually engaged in the project and she sought to learn more about not only mosquito borne illness but also community health education strategies in developing countries. She worked well with all members of the team--the Capracare volunteers, the nurses and other visitors. It was a truly collaborative effort working with her (and N) on this project. She excelled at being able to focus both on immediate details while keeping in mind the bigger picture.
What are the areas needing improvement?	I had hoped to get more of the geospatial analysis accomplished but it will take some additional effort to learn the mapping methods. I had hoped she'd take a bit more initiative but this comment is more about a missed opportunity than a criticism. We have discussed this and she's interested in continuing with the geospatial analysis over the summer.
Other comments regarding the intern:	K proved to be adaptable and skilled; always a pleasure to work with.

Future Opportunities

Would you be willing to take another student next semester?	Yes

EPIDEMIOLOGY/BIOSTATISTICS
Fieldwork Preceptor Evaluation Form

Student: [redacted] Preceptor: Lorna Thorpe

Name of Agency: CUNY School of Public Health Dates of Placement: 11/2014 To 5/2015

Please check one box in each row.

	Excellent (Performs on a Level that is Professional)	Above Average	Average (Needs to Improve)	Below Average	No Opportunity To Observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works	X				
b) Public health principles and concepts	X				
2. Skills in:					
a) Planning	X				
b) Implementation	X				
c) Organizing		X			
d) Program analysis and evaluation	X				
e) Writing		X			
f) Verbal communication	X				
g) Data manipulation/analysis	X				
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers	X				
2. Organizes and uses time effectively.	X				
3. Considers and incorporates the ideas of others	X				
4. Is able to facilitate work of committees and other groups	X				
5. Submits accurate, well documented work and reports	X				
6. Accepts responsibility and completes work assignments	X				
7. Raises innovative ideas and brings out creative and innovative ideas in others	X				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: [redacted] **is a consummate team player, excels in systems thinking, brings a strong empathy for the community this project is serving, and has helped guide "many" decisions around the community report being developed. [redacted] is highly skilled and would be hired again in a heartbeat.**
2. Skills and knowledge needing further improvement: **Few areas in need of improvement. [redacted] has been a terrific asset in a complex environment (Partnerships like HHAP are inherently complicated, and [redacted] works for a preceptor who is pulled in many directions). [redacted] communicates well with all partners, including her preceptor. The only two suggestions for improvement are extremely modest in scope, and they include: (1) In writing initiatives, work from an outline approach and get input at each stage of writing, to avoid delving**

too far in certain directions unnecessarily; (2) Taking initiative to 'check in' more frequently when priorities and deadlines meant to maximize communication. On the latter item, the preceptor takes full responsibility for not always encouraging this herself.

3. Other comments: [redacted] has natural project management tendencies and excellent data management skills. She is passionate about advocating for disadvantaged communities in the context of a complex healthcare system and would be a true asset to any organization conducting research to address health disparities or improve quality of care. We will sorely miss [redacted] creativity and productivity on this project.

Site Supervisor's Signature _____ Date: 5/26/15

You are encouraged to discuss this evaluation with the student.

EVALUATION FORM - SUPERVISOR

Intern Information

Int First Name:		Int Last Name:	

Supervisor Information

Sup First Name:	Betsy	Sup Last Name:	Eastwood
Organization:	SUNY Downstate Medical Center		

Evaluation

Please evaluate the intern based on the following aspects

A) Work Performance

Arrives on time consistently	Excellent
Uses time effectively	Excellent
Reliably completes tasks on time	Excellent
Effectiveness in written communication	Excellent
Effectiveness in oral communication	Excellent
Ability to identify problems and proposes solutions	Excellent
Overall quality or work produced	Excellent

B) Work Attitudes

Accepts responsibilities	Excellent
Takes initiative	Excellent
Follows policies, rules, regulations, etc.	Excellent
Graciously accepts ideas and suggestions	Excellent
Perfoms tasks with industry and drive	Excellent

Evaluation

Please evaluate the intern based on the following aspects

C) Professional Relationship With:

Professional staff	Excellent
Support staff	N/A
Supervisor	Excellent
Personnel from other organizations	Excellent
Clientele	N/A
General public	N/A

D) Application of community Health Skills

Assessing health problems	N/A
Developing health objectives	N/A
Planning health programs/projects	Excellent
Implementing programs/projects	Excellent
Evaluating programs/projects	Excellent
Developing budgets	N/A
Applying research methodologies	Excellent
Compiling health data/statistics	Excellent
Facilitating group process	N/A

E) Personal Characteristics

Dependability	Excellent
Tactfulness	Excellent
Listening ability	Excellent
Sensitivity	Excellent

Evaluation

Please evaluate the intern based on the following aspects

F) Overall Assessment

What is the overall assessment of the intern?	Excellent
What are the outstanding strengths of the intern?	N is a very quick study. She grasps ideas and tasks really quickly. She has also pitched in when we have had surprise deadlines. She sticks with the job until it's done.
What are the areas needing improvement?	N still does not know how smart she is. When she figures this out, she'll fly.
Other comments regarding the intern:	best ever!

Future Opportunities

Would you be willing to take another student next semester?	Yes

Preceptor's Evaluation Form
Hunter College Environmental and Occupational Health Sciences Program
CUNY School of Public Health

Student: [redacted] Site Supervisor: Dr. REKHA BHANDARI

Name of Organization: GLENWOOD MEDICAL ASSOCIATES Dates of placement: Full Time Employment

	Please check one box in each row.				
	Excellent (performs on highly professional level)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of: a) Technical & political climate within which organization works	✓				
b) Environmental and occupational health principles and concepts		✓			
c) Legal and regulatory environment	✓				
2. Skills in: a) Planning	✓				
b) Implementation	✓				
c) Exposure assessment		✓			
d) Program analysis and evaluation	✓				
e) Written communication	✓				
f) Verbal communication	✓				
g) Data evaluation and analysis		✓			
h) Training and education		✓			
i) Hazard evaluation and abatement	✓				
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.	✓				
2. Organizes and uses time effectively.	✓				
3. Considers and incorporates the ideas of others	✓				
4. Is able to facilitate work of committees and other groups.	✓				
5. Submits accurate, well documented work and reports.	✓				
6. Accepts responsibility and completes work assignments	✓				
7. Raises innovative ideas and brings out creative and innovative ideas in others	✓				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: Hard working, Diligent, Good human relations

2. Skills and knowledge needing further improvement: Currently focusing on improving her knowledge and skills

3. Other comments:

Site Supervisor's Signature Rekha Bhandari **Date:** 5/19/15

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 5/13/15

Semester: Spring Semester 2015

Name of Preceptor: Bianca Lopez

Agency/Organization: Boom! Health

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	8
2.	Motivation	8
3.	Self-directed resourcefulness	8
4.	Value of the contributions to the Agency	8
5.	Reliability/adherence to promised schedules	8
6.	Interpersonal skills	8
7.	Overall rating	8

Total number of Agency clinical hours completed: 166.5

Preceptor's comments on particular areas of student growth and performance:

[redacted] is very resourceful and completes tasks independently in a timely fashion - I look forward to continue working with her next semester.

Bianca Lopez — Signature of Agency Preceptor

5/13/15 — Date

Student Comments:

[redacted] — Signature of Student

5/13/15. — Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: _____ (conferences, CE, etc.)

Total Number of clinical hours completed: _____ (167 hours required)

Grade in clinical portion of course: Pass _____ Fail _____

Signature of Seminar Instructor — Date

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 5/4/2015

Semester: Spring 2015

Name of Preceptor: April Autry

Agency/Organization: Doctors of the World - Bethany Free Clinic

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	9
2.	Motivation	8
3.	Self-directed resourcefulness	7
4.	Value of the contributions to the Agency	8
5.	Reliability/adherence to promised schedules	10
6.	Interpersonal skills	7
7.	Overall rating	8

Total number of Agency clinical hours completed: 171

Preceptor's comments on particular areas of student growth and performance:

[redacted] worked very well but needed a lot of direction and support - however, when given a task she worked very hard to complete and do her best. She was always punctual and gave account for her time and work produced. She was polite and always had a nice appearance. She was kind to the patients she interacted with.

* Areas for improvement → taking initiative
↳ interpersonal skills [*note- Even in the course of the semester, [redacted] improved considerably in this area - introducing herself, making eye contact, improved communication with myself and staff.]

Overall, despite taking more time and work on my end than anticipated, [redacted] contributions to the organization and the clinic were many and so very valuable. I am grateful for her time and support.

5/7/2015
Signature of Agency Preceptor Date

Student Comments:

[redacted]
Signature of Student May 7th 2015 Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 12 (conferences, CE, etc.)

Total Number of clinical hours completed: 159 (167 hours required)

Grade in clinical portion of course: Pass ✓ Fail _____

Lauren Liess 5/19/15
Signature of Seminar Instructor Date

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 5/15/15

Semester: Spring 2015

Name of Preceptor: Dr Jeffrey Birbaum

Agency/Organization: HEAT

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	10
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	10
6.	Interpersonal skills	10
7.	Overall rating	10

Total number of Agency clinical hours completed: 147

Preceptor's comments on particular areas of student growth and performance:

[redacted] came to our program with incredible enthusiasm to learn about the services we provide for HIV+ youth & high risk LGBT youth. She is a very quick learner, highly personable with patients & a great team member. She quickly became apropponent of the clinic's philosophy of harm reduction & youth focused approach to HIV treatment adherence. She will make an outstanding advanced practice public health nurse.

[redacted] 5/15/15

Signature of Agency Preceptor Date

Student Comments:

I am very greatful for the experience. The experience I gained from HEAT clinic was an eye opening. I can not wait to go back next semister

[redacted] 5/15/15

Signature of Student Date

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 25 (conferences, CE, etc.)

Total Number of clinical hours completed: 147 Total: 172 (167 hours required)

Grade in clinical portion of course: Pass ✓ Fail _____

[redacted] 05.21.15

Signature of Seminar Instructor Date

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 5/19/2015

Semester: Spring 2015

Name of Preceptor: Caleb C. Terry

Agency/Organization: Housing Works

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	9
4.	Value of the contributions to the Agency	9
5.	Reliability/adherence to promised schedules	10
6.	Interpersonal skills	9
7.	Overall rating	9

Total number of Agency clinical hours completed: 190

Preceptor's comments on particular areas of student growth and performance:

[redacted] is a professional, motivated, self starter. He was able to plan and implement the requested project with very little input and little to no supervision. The project was something the agency needed and may not have been accomplished without his assistance. [redacted] was a tremendous help and a joy to work with.

Signature of Agency Preceptor — Date: 5/19/2015

Student Comments:

[redacted]

Signature of Student — Date: 5/19/2015

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 3 (conferences, CE, etc.)

Total Number of clinical hours completed: 190 (167 hours required)

Grade in clinical portion of course: Pass ✓ Fail _____

Signature of Seminar Instructor — Date: 5/21/15

HUNTER COLLEGE OF THE CITY OF UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

PRECEPTOR EVALUATION OF STUDENT PERFORMANCE
COMMUNITY/PUBLIC HEALTH NURSING

Course: Nursing 771/772/773 Date: 4/20/15

Semester: Spring 2015

Name of Preceptor: Elaine Larson

Agency/Organization: Columbia University School of Nursing

Name of Student: [redacted]

Preceptor:
Please review this form with the student. It is the student's responsibility to submit the completed form to the Seminar Faculty who assigns a final grade and gives the completed form to the Course Faculty. Without this form, the student cannot pass the course.

Please rate the student's performance in each of the following areas on a scale of "1" to "10," with "1" representing the lowest levels of performance and "10" the highest.

		Rating (1 to 10)
1.	Professional appearance/manner/demeanor	10
2.	Motivation	10
3.	Self-directed resourcefulness	10
4.	Value of the contributions to the Agency	10
5.	Reliability/adherence to promised schedules	9
6.	Interpersonal skills	10
7.	Overall rating	10

Total number of Agency clinical hours completed: 168

Preceptor's comments on particular areas of student growth and performance:

During this semester Ms. [redacted] has taken a leadership role as the interviewer for a qualitative study conducted collaboratively under the aegis of a parent study funded by AHRQ to develop interventions to reduce health care associated infections among staff and children in three pediatric longterm care facilities. A total of 29 interviews were conducted and the qualitative data are now being analyzed. Ms. [redacted] will be assisting with data interpretation and drafting a manuscript for publication.
In a related project, she has been working with another faculty member to observe opportunities and adherence to hand hygiene in these same facilities. Hundreds of opportunities have been recorded. Ms. [redacted] has entered the data into an Excel file and will be assisting with data analysis and write of these results as well. She will also work with us to help provide feedback to staff about the results of these projects.

Elaine Larson 5/15/15

Signature of Agency Preceptor Date

Student Comments:
I have been afforded exceptional opportunities by Dr. Larson and her team and I have tried to take advantage of them all in addition to making a contribution to the projects mentioned.

[redacted] 5/15/15

Signature of Student Date

I will work to improve in the areas we discussed. SRN

The section below is completed by the Hunter-Bellevue School of Nursing Seminar Faculty

Number of non-Agency clinical hours completed: 1 (conferences, CE, etc.)

Total Number of clinical hours completed: 168 (167 hours required)

Grade in clinical portion of course: Pass ✓ Fail _____

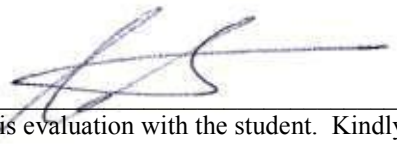
EPIDEMIOLOGY/BIOSTATISTICS
Fieldwork Preceptor Evaluation Form

Student:_____ Site Supervisor: Andrew Maroko
Name of Agency: CUNY Institute for Health Equity Dates of placement: Spring, 2015

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No oppotunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works	X				
b) Public health principles and concepts	X				
2. Skills in:					
a) Planning	X				
b) Implementation	X				
c) Organizing	X				
d) Program analysis and evaluation					X
e) Writing		X			
f) Verbal communication	X				
g) Data manipulation/analysis	X*				
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.	X				
2. Organizes and uses time effectively.	X				
3. Considers and incorporates the ideas of others	X				
4. Is able to facilitate work of committees and other groups.	X				
5. Submits accurate, well documented work and reports.		X			
6. Accepts responsibility and completes work assignments	X				
7. Raises innovative ideas and brings out creative and innovative ideas in others		X			

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: *Ms. Y is a pleasure to work with. I have no doubt she will do extremely well with her academic and professional goals. I would say a special strength of hers would be intellectual curiosity coupled with a good work ethic. A great combination.*
2. Skills and knowledge needing further improvement: *As with many students (as well as this particular preceptor), working on academic writing is always a good thing.*
3. Other comments: * *Although we did not yet do much data work or analyses, we are just beginning to get moving on that and I feel pretty confident that S will do a very good job based on a number of conversations we had about approaches and issues, which is why I marked her as such on the matrix above.*

Site Supervisor's Signature  _____ **Date**: 5/26/15

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 07/26/14

Preceptor(s) name: Justin T. Brown

Title(s): Executive Research Associate

Agency/department: CUNY Institute for Health Equity

Phone: 347-577-4007

e-mail: jbrown@cunyhealthequity.org

Agency address: Lehman College; 250 Bedford Park Blvd. West; Gillet Hall, Room 033; Bronx, NY 10468

Name of student intern:

Did the student complete the required 180 hours*? Yes*

	Excellent	Above Average	Average	Below Average	No opportunity to observe/does not apply
Work Performance					
Arrives on time consistently	x				
Uses time effectively	x				
Informs supervisor and makes arrangements for absences	x				
Reliably completes tasks on time	x				
Effectiveness in written	x				

communication					
Effectiveness in oral communication	**x**				
Ability to identify problems and troubleshoot	**x**				
Analytical ability	**x**				
Ability to work on a team	**x**				
Overall quality of work produced	**x**				
Other (please specify)					

	Excellent	**Above Average**	**Average**	**Below Average**	**No opportunity to observe/does not apply**
Work Attitudes					
Accepts responsibility	**x**				
Takes initiative	**x**				
Follows policies, rules, regulations of agency	**x**				
Accepts ideas and suggestions of others	**x**				
Performs tasks with industry and drive	**x**				

Other (please specify)					
Professional Relationships with:					
Professional staff	**x**				
Support staff	**x**				
Supervisor	**x**				
Personnel form other organizations	**x**				
Participants/clients/patients					**x**
General public	**x**				
Other (please specify): Affiliated faculty & other interns	**x**				
Application of community health skills					
Obtaining & using appropriate information from published and unpublished literature	**x**				
Assessing health problems	**x**				
Developing health objectives	**x**				
Using health-related data	**x**				
Planning & developing health programs and projects	**x**				
Managing health programs					**x**
Evaluating health programs					**x**
Data collection activities					**x**
Analyzing data					**x**
Other (please specify):					

Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

This was a wonderful opportunity for CIHE. We have worked with MPH students in the past in other capacities, but the additional activities and requirements of the internship afforded us the opportunity to expand upon a general organizational internship. This allowed us the opportunity to develop more individualized and tailored activities for the student. Additionally, this opportunity helped establish stronger working relationships with the student, which has resulted in her preliminarily planning to build upon this experience by developing her capstone project. This also helped us by providing an additional level of on-site team member that could serve as a mentor and support to the undergraduate interns participating in our summer internship program.

In terms of suggestions, it would be wonderful if there were meetings with the internship coordinator to establish a collaborative support network for the student. Additionally, it would be helpful to have an initial meeting to discuss the potential opportunities at the Institute prior to students selecting or arriving at the site so they can be provided some initial general background about the work of CIHE.

Would you like to continue participating in the Lehman MPH internship program? ***Yes***

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

LEHMAN COLLEGE

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 7/31/14

Preceptor(s) name: AnaGarcia

Title(s): Director

Agency/department: Health Policy, NYAM

Phone: e-mail: agarcia@nyam.org

Agency address:

Name of student intern: [redacted]

Did the student complete the required 180 hours? ☐ Yes ☐ No Unsure

If no, please explain: she had a lot of absences

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently				X	
Uses time effectively				X	
Informs supervisor and makes arrangements for absences		✓			
Reliably completes tasks on time				X	
Effectiveness in written communication				X	
Effectiveness in oral communication			X		

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot					X
Analytical ability					X
Ability to work on a team			X		
Overall quality of work produced					
Other *(please specify)*					did not complete the work

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility			X		
Takes initiative		X			
Follows policies, rules, regulations of agency			X		
Accepts ideas and suggestions of others			She listened well/was receptive but cannot clear the action*		
Performs tasks with industry and drive					X
Other *(please specify)*					
Professional relationships with:					
Professional staff			X		
Support staff			X		
Supervisor			✓		
Personnel from other organizations					X
Participants/clients/patients					✓
General public					X
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and				X	

*took advice

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
unpublished literature					
Assessing health problems					X
Developing health objectives					X
Using health-related data				X	
Planning & developing health programs and projects					X
Managing health programs					X
Evaluating health programs					X
Data collection activities				X	
Analyzing data				X	
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program? She was not prepared for any part of this work.
2. Would you like to continue participating in the Lehman MPH internship program?
   ☐ Yes ☐ No ☒ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 7/17/14

Preceptor(s) name: Keville Frederickson; Cidna Valentin

Title(s): Professor; Postdoctoral Fellow

Agency/department: PhD Program in Nursing, Graduate Center; Office of the University Dean for Health and Human Services

Phone: 212-817-7987 ; 646-664-8239

E-mail: Keville.frederickson@lehman.cuny.edu; cvalentin@gc.cuny.edu

Agency address: 555 W. 57th Street; 365 5th Ave

Name of student intern:

Did the student complete the required 180 hours? X☐ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently			**X**		
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences	**X**				
Reliably completes tasks on time	**X**				
Effectiveness in written communication	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Effectiveness in oral communication	**X**				
Ability to identify problems and troubleshoot	**X**				
Analytical ability	**X**				
Ability to work on a team	**X**				
Overall quality of work produced	**X**				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**X**				
Takes initiative	**X**				
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**X**				
Support staff	**X**				
Supervisor	**X**				
Personnel from other organizations	**X**				
Participants/clients/patients	**X**				
General public	**X**				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Application of community health skills					
Obtaining & using appropriate information from published and unpublished literature					**X**
Assessing health problems					**X**
Developing health objectives					**X**
Using health-related data		**X**			
Planning & developing health programs and projects		**X**			
Managing health programs					**X**
Evaluating health programs					**X**
Data collection activities		**X**			
Analyzing data		**X**			
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship useful for your agency? Are there any suggestions you would like to make for the internship program?

This was an excellent experience and we enjoyed the opportunity to contribute to G's professional development. Her positivity, flexibility, and strong work ethic made her a welcomed asset to the team!

2. Would you like to continue participating in the Lehman MPH internship program?
   ☐ Yes ☐ No X☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: 7/25/14

Preceptor(s) name: Sean J. Haley Ph.D., MPH

Title(s): Assistant Professor

Agency/department: HNS

Phone: 718.951.5000 x2776 e-mail: sjhaley@brooklyn.cuny.edu

Agency address: Brooklyn College 2900 Bedford Ave Brooklyn NY

Name of student intern:

Did the student complete the required 180 hours? ☒ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**x**				
Uses time effectively					**x**
Informs supervisor and makes arrangements for absences	**x**				
Reliably completes tasks on time	**x**				
Effectiveness in written communication					**x**
Effectiveness in oral communication	**x**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot		**x**			
Analytical ability		**x**			
Ability to work on a team	**x**				
Overall quality of work produced	**x**				
Other *(please specify)*					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**x**				
Takes initiative	**x**				
Follows policies, rules, regulations of agency	**x**				
Accepts ideas and suggestions of others	**x**				
Performs tasks with industry and drive	**x**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**x**				
Support staff					**x**
Supervisor	**x**				
Personnel from other organizations					**x**
Participants/clients/patients					**x**
General public					**x**
Other *(please specify)*					
Application of community health skills					
Obtaining & using appropriate information from published and	**x**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
unpublished literature					
Assessing health problems					**x**
Developing health objectives					**x**
Using health-related data	**x**				
Planning & developing health programs and projects					**x**
Managing health programs					**x**
Evaluating health programs					**x**
Data collection activities		**x**			
Analyzing data					**x**
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program?

S was a committed team member. He was enthusiastic, had super follow through and always had a positive attitude. His work, and that of his team were indispensable for moving the project forward.

2. Would you like to continue participating in the Lehman MPH internship program?
   ☒ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

LEHMAN COLLEGE

Master of Public Health (MPH) Program

Preceptor Final Evaluation of Internship Form

Date: July 18, 2014

Preceptor(s) name: Estelle M. Raboni, MPH, MCHES

Title(s): Director, Changing the Odds

Agency/department: Morris Heights Health Center

Phone: (718) 483-1270 ext. 8152 e-mail: eraboni@mhhc.org

Agency address: 2306 Walton Avenue, Bronx, NY 10468

Name of student intern:

Did the student complete the required 180 hours? x☐ Yes ☐ No

If no, please explain:

A. Please evaluate the student by checking the appropriate box:

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work performance					
Arrives on time consistently	**X**				
Uses time effectively	**X**				
Informs supervisor and makes arrangements for absences	**X**				
Reliably completes tasks on time	**X**				
Effectiveness in written communication	**X**				
Effectiveness in oral communication	**X**				

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Ability to identify problems and troubleshoot	**X**				
Analytical ability	**X**				
Ability to work on a team	**X**				
Overall quality of work produced	**X**				
Other *(please specify)* *Co-facilitation skills*		**X**			

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Work attitudes					
Accepts responsibility	**X**				
Takes initiative	**X**				
Follows policies, rules, regulations of agency	**X**				
Accepts ideas and suggestions of others	**X**				
Performs tasks with industry and drive	**X**				
Other *(please specify)*					
Professional relationships with:					
Professional staff	**X**				
Support staff					**X**
Supervisor	**X**				
Personnel from other organizations	**X**				
Participants/clients/patients		**X**			
General public	**X**				
Other *(please specify)*					
Application of community health skills					

	Excellent	Above average	Average	Below Average	No opportunity to observe/does not apply
Obtaining & using appropriate information from published and unpublished literature	**X**				
Assessing health problems					**X**
Developing health objectives					**X**
Using health-related data	**X**				
Planning & developing health programs and projects		**X**			
Managing health programs					**X**
Evaluating health programs		**X**			
Data collection activities		**X**			
Analyzing data		**X**			
Other *(please specify)*					

B. Overall Feedback on Internship:

1. Was the internship was useful for your agency? Are there any suggestions you would like to make for the internship program? The internship was extremely useful to our agency and more specifically to our program. J did projects which I did not nor my staff have the time to devote to. She was incredibly diligent and wasn't afraid to ask questions.

2. Would you like to continue participating in the Lehman MPH internship program?
   x☐ Yes ☐ No ☐ Not sure

Return to: Emma Tsui (emma.tsui@lehman.cuny.edu)

Preceptor's Evaluation Form
Hunter College Environmental and Occupational Health Sciences Program
CUNY School of Public Health

Student: [redacted] Site Supervisor: Lina Hernandez

Name of Organization: Pure Earth - Blacksmith Institute Dates of placement: May 27, 2015 to August 31, 2015

Please check one box in each row.

	Excellent (performs on highly professional level)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of: a) Technical & political climate within which organization works	X				
b) Environmental and occupational health principles and concepts	X				
c) Legal and regulatory environment					X
2. Skills in: a) Planning	X				
b) Implementation	X				
c) Exposure assessment					X
d) Program analysis and evaluation	X				
e) Written communication	X				
f) Verbal communication	X				
g) Data evaluation and analysis	X				
h) Training and education	X				
i) Hazard evaluation and abatement					X
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers	X				
2. Organizes and uses time effectively	X				
3. Considers and incorporates the ideas of others	X				
4. Is able to facilitate work of committees and other groups	X				
5. Submits accurate, well documented work and reports	X				
6. Accepts responsibility and completes work assignments	X				
7. Raises innovative ideas and brings out creative and innovative ideas in others	X				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: [redacted] is very responsible, highly committed with the assigned tasks and friendly in the work environment.

2. Skills and knowledge needing further improvement:
[redacted] has helped us with our work in Latin America; he has a good knowledge of Spanish but still need to improve the speaking skills.

3. Other comments:

Site Supervisor's Signature Lina Rocio Hernandez G **Date:** Aug/7/2015

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

EPIDEMIOLOGY/BIOSTATISTICS
Fieldwork Preceptor Evaluation Form

Student: _____ Preceptor: Jean Grassman

Name of Agency: Capracare Dates of Placement: April 2015 To August 2015

	Please check one box in each row.				
	Excellent (Performs on a Level that is Professional)	**Above Average**	**Average** (Needs to Improve)	**Below Average**	No Oppotunity To Observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works					XXX
b) Public health principles and concepts	XXX				
2. Skills in:					
a) Planning	XXX				
b) Implementation	XXX				
c) Organizing	XXX				
d) Program analysis and evaluation					XXX
e) Writing	XXX				
f) Verbal communication	XXX				
g) Data manipulation/analysis	XXX				
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.	XXX				
2. Organizes and uses time effectively.	XXX				
3. Considers and incorporates the ideas of others	XXX				
4. Is able to facilitate work of committees and other groups.	XXX				
5. Submits accurate, well documented work and reports.	XXX				
6. Accepts responsibility and completes work assignments	XXX				
7. Raises innovative ideas and brings out creative and innovative ideas in others	XXX				

COMMENTS (Please respond briefly. Use reverse side if necessary):
1. Special strengths:
A quality that served Z well in this project was her ability to plan and be proactive. The project included two other graduate students, a Capracare volunteer, and an undergraduate, Phuonise, who translated and entered the data into Excel. I don't believe Z has met any of us face to face, yet she was able to move forward with her project and collaborate with the others. In particular, Z needed to make her needs clear and work with Phuonise in order to prepare the datafile for SAS. She clearly had a good sense of pacing for the project and worked hard to meet her goals.

Z has been an effective communicator based on my interactions with her by email and telephone. She was diligent about reporting on her progress, and let me know when she felt it necessary to discuss stages of the work by telephone. Her descriptions of her plans, progress, concerns, barriers, and results were clear and complete. These remarks include my communications directly with her and instances where she communicated with other members of the team and cc:ed me.

I'm reviewing her analysis and am satisfied. A brief perusal reveals some surprising results which the project will use in follow up—for instance, a substantial percentage of the respondents are burning mosquito coils. This observations highlights the need to check the constituents of the coils to ensure they are not harmful.

Overall, I'm pleased with her work and consider the project fortunate to have her input and participation.

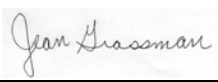
2. Skills and knowledge needing further improvement:
Z is in the early stages of her career as an epidemiologist. To her credit, she asked for assistance in SAS from faculty here at Brooklyn. It was a prudent request, just one I was not able to fulfill. Based on her results, I trust she found the support she needed elsewhere.

3. Other comments:
1) Regarding IRB: Z has been added to the personnel list associated with the IRB protocol **Community Health Education in Rural Haiti**. In the IRBnet system, this project was reviewed by the Board and given an "Exempt" status that extends into 2016. Exempt projects were not transferred to IDEATE which meant the project had to be re-entered so it is currently listed as "Under development".

Z has passed the CITI 1 Basic course and promptly provided me with documentation showing that her training is current. She's been added to the protocol but I'm still waiting for the new system to update the project.

2) Contract: I'd like to highlight that Z completed most of the items on her contract. We were all a bit optimistic about the second phase of the project which involved developing and delivering the mosquito-avoidance workshops in Haiti. The other students have developed drafts of the workshops which need to be refined. The delivery of the workshops has been delayed largely because the US-based Capracare volunteers won't be traveling to Haiti in August as originally planned. The project is following the timeline albeit with an approximately 6 month delay. I plan on drafting a manuscript this fall. I realize this falls outside Z's timeline but hope she can participate since it would give her a chance to work on first-hand on a manuscript and be an author on a publication.

I realize this is a short review. I'm happy to provide further or more specific details.

Site Supervisor's Signature  **Date**: __August 9, 2015_____
You are encouraged to discuss this evaluation with the student.

Preceptor's Evaluation Form
Hunter College Environmental and Occupational Health Sciences Program
CUNY School of Public Health

Student: [redacted] Site Supervisor: Glenn Private

Name of Organization: Leviton Mfg Co, Inc Dates of placement: 4/1/15 - 8/15/15

	Please check one box in each row				
	Excellent (performs on highly professional level)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of: a) Technical & political climate within which organization works	✓				
b) Environmental and occupational health principles and concepts	✓				
c) Legal and regulatory environment	✓				
2. Skills in: a) Planning	✓				
b) Implementation	✓				
c) Exposure assessment	✓				
d) Program analysis and evaluation	✓				
e) Written communication	✓				
f) Verbal communication	✓				
g) Data evaluation and analysis	✓				
h) Training and education	✓				
i) Hazard evaluation and abatement	✓				
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.	✓				
2. Organizes and uses time effectively.	✓				
3. Considers and incorporates the ideas of others	✓				
4. Is able to facilitate work of committees and other groups.	✓				
5. Submits accurate, well documented work and reports.	✓				
6. Accepts responsibility and completes work assignments	✓				
7. Raises innovative ideas and brings out creative and innovative ideas in others	✓				

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths: [redacted] HAS A KEEN ABILITY TO CONSIDER WITH PEOPLE IN ALL LEVELS TO MAKE THINGS HAPPEN. SHE IS NOT ONLY FULL OF ENERGY BUT IS WELL-VERSED IN HER EDUCATION AND CONTINUES TO EXPAND HER KNOWLEDGE IN EH&S. [redacted] RESPECTS OTHERS' OPINIONS BEFORE MAKING HER CASE WITH FACTS AND DATA.
2. Skills and knowledge needing further improvement: JUST TO CONTINUE WITH HER EDUCATION AND HANDS-ON EXPERIENCE IN THE FACILITIES - WHICH SHE IS DOING.
3. Other comments: [redacted] IS A JOY TO WORK WITH AND A TRUE PROFESSIONAL.

Site Supervisor's Signature _____ **Date:** 8/11/15

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

Epidemiology/Biostatistics

Fieldwork Preceptor Evaluation Form

Student: [redacted] Site Supervisor: E. Zoe Schuttman

Name of Agency: Immigrant Health & Cancer Disparities - MSKCC Dates of placement: 06/01/15 – 08/07/15

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
i. Appreciation and knowledge of:					
a) Technical & political climate within which agency works	X				
b) Public health principles and concepts	X				
ii. Skills in:					
a) Planning	X				
b) Implementation	X				
c) Organizing	X				
d) Program analysis and evaluation	X				
e) Writing	X				
f) Verbal communication	X				
g) Data manipulation/analysis	X				
OVERALL PERFORMANCE					
i. Establishes friendly relationship with co-workers.	X				
ii. Organizes and uses time effectively.	X				
iii. Considers and incorporates the ideas of others	X				
iv. Is able to facilitate work of committees and other groups.	X				
v. Submits accurate, well documented work and reports.	X				
vi. Accepts responsibility and completes work assignments	X				
vii. Raises innovative ideas and brings out creative and innovative ideas in others	X				

COMMENTS [Please respond briefly. Use reverse side if necessary]:

1. Special strengths: Mental acuity and ability to analyze data and facts; excellent language skills
2. Skills and knowledge needing further improvement: None
3. Other comments: Would be a true asset to any team he may be a part of. Knows the definition of teamwork and effective communication to achieve desired outcomes/goals.

Site Supervisor's Signature [signature] **Date:** 8/7/15

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

PRECEPTOR EVALUATION FORMS

(Note: Each Campus / Specialization within CUNY SPH @ Hunter has a Unique Forms)

EPIDEMIOLOGY/BIOSTATISTICS

Fieldwork Preceptor Evaluation Form

Student: _ _____ Site Supervisor: __Maria R Khan_____

Name of Agency: NYU School of Medicine Department of Population Health Dates of placement: 6/22-9/21/2015

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works	X				
b) Public health principles and concepts	X				
2. Skills in:					
a) Planning		X			
b) Implementation		X			
c) Organizing		X			
d) Program analysis and evaluation					X
e) Writing	X				
f) Verbal communication		X			
g) Data manipulation/analysis		X			
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.	X				
2. Organizes and uses time effectively.	X				
3. Considers and incorporates the ideas of others	X				
4. Is able to facilitate work of committees and other groups.					X
5. Submits accurate, well documented work and reports.	X				
6. Accepts responsibility and completes work assignments	X				
7. Raises innovative ideas and brings out creative and innovative ideas in others		X			

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:

S is clearly very committed to improving the public health of the Caribbean, fueled by her background and personal experiences. S is very personable and a pleasure to work with. She is flexible and willing to help out with any tasks that are asked of her.

2. Skills and knowledge needing further improvement:

S should continue to strengthen her statistical knowledge and data analysis skills, which she will certainly do as she progresses in her MPH program.

3. Other comments:

I look forward to continuing to work with S through the fall and into the spring. She will have the opportunity to work on a publication on socio-economic correlates of STI among pregnant women in Haiti while she prepares the data for her analysis of gender differences in correlates of STI.



Site Supervisor's Signature_____ **Date**: __8/6/2015___
You are encouraged to discuss this evaluation with the student.

Kindly return the completed form by August 10, 2015 to:
Heidi Jones: HJON@HUNTER.CUNY.EDU

DPH PRACTICUM PROJECT FINAL REPORT (Sponsor)

Student name:
DPH Track: EOH

Practicum sponsor's name: Professor E. A. G. Geltman

Practicum Project description (one sentence):

Instructions

The Practicum Sponsor is to complete this report and provide it to the student, for submission to the Instructor. Both the student and the Practicum Sponsor must sign the report. The final version, with signatures, must be submitted via email to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu). Either the Practicum Sponsor or the student may submit the final signed report.

DEADLINE: May 15, 2015

Overall Practicum Project Assessment

Please check the statement which best summarizes the student's Practicum Project work:

- ☐x Project completed on schedule with initial Learning Plan
- ☐ Project completed ahead of schedule from initial Learning Plan (describe any adjustments in 1.)
- ☐ Project behind schedule from initial Learning Plan (describe any adjustments in 1.)

Practicum Sponsor's Comments on Student Completion of the Practicum Project

This form is to be completed by the Practicum Project sponsor, after meeting with the student and careful review of the student's work to complete the Practicum Project. The form must then be co-signed by the student.

*Please submit the completed form electronically to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu) and include both the student and the sponsor on the message sent.

1. Please comment on the student's work over the Practicum Project period, including anything notable about time and effort, quality of work completed, identified strengths and weaknesses, etc.

The project required intense work during a short period of time in order to assist in preparing backup documents for my testimony before US EPA in an IRIS proceeding.. H put together a briefing book for me with background materials. Briefing books are important during testimony in case a question is asked that goes into specific detail. The briefing book would allow me to quote passages and give specific citations if need be. See attached.

2. Please comment on the student's progress towards mastering the competencies s/he identified as relevant to the Practicum Project's stated objectives and activities. This information is presented in the student's detailed Learning Plan.

H was very pleasant to work with and completed materials on time. He was a good participant in the group and provided keen insights to other students working on separate research projects.

3. Has the student met with you to discuss his/her completion of the Practicum Project? Please briefly describe your meetings over the course of the Practicum Project period, any changes, etc. If you have not met, please explain.
   We met weekly to discuss progress and review materials.

Signature of sponsor: _____Liz Geltman_____ Date: as of 5/15/15_____

To be completed by the student:

☐ I agree with the comments on my Practicum Project progress provided by my sponsor.

☐ I do not agree with the comments on my Practicum Project progress provided by my sponsor.

Please explain:

Signature of student: _____ Date:_____

DPH PRACTICUM PROJECT FINAL REPORT (Sponsor)

Student name:

DPH Track: EOH Project

Practicum sponsor's name: Sherry Baron

Practicum Project description (one sentence):
Conduct a literature review is to determine what is known about diet and BPA exposure in African American women and children and develop an analysis plan using the NHANES data to fill research gaps.

Instructions

The Practicum Sponsor is to complete this report and provide it to the student, for submission to the Instructor. Both the student and the Practicum Sponsor must sign the report. The final version, with signatures, must be submitted via email to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu). Either the Practicum Sponsor or the student may submit the final signed report.

DEADLINE: May 15, 2015

Overall Practicum Project Assessment

Please check the statement which best summarizes the student's Practicum Project work:

- ☐ Project completed on schedule with initial Learning Plan
- ☐ Project completed ahead of schedule from initial Learning Plan (describe any adjustments in 1.)
- x Project behind schedule from initial Learning Plan (describe any adjustments in 1.)

Practicum Sponsor's Comments on Student Completion of the Practicum Project

This form is to be completed by the Practicum Project sponsor, after meeting with the student and careful review of the student's work to complete the Practicum Project. The form must then be co-signed by the student.

*Please submit the completed form electronically to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu) and include both the student and the sponsor on the message sent.

1. Please comment on the student's work over the Practicum Project period, including anything notable about time and effort, quality of work completed, identified strengths and weaknesses, etc.

L focused most of her work this semester on refining the focus for her literature review. She found that her initial literature search identified more than a 100 potential articles and thus she needed to devote time to reading and refining the goals and scope of her topic. This was a good exercise for her as it required her to think critically about her research question and developed a much more focused approach. This became a larger project than she initially planned and thus she was not able to also complete the analysis plan for the NHANES data. While this meant that that she fell behind on her initial objectives, I felt that the additional time spent defining the research gaps was essential and a necessary step before she launched into any analysis of data.

2. Please comment on the student's progress towards mastering the competencies s/he identified as relevant to the Practicum Project's stated objectives and activities. This information is presented in the student's detailed Learning Plan.

L made very good progress in improving her technical writing and in learning to define a clear and specific research question. She also gained technical knowledge about current research approaches and gaps related to her research question.

3. Has the student met with you to discuss his/her completion of the Practicum Project? Please briefly describe your meetings over the course of the Practicum Project period, any changes, etc. If you have not met, please explain.

   We have met approximately every 2 weeks to discuss her progress and to review drafts of her written report.

Signature of sponsor: __Sherry Baron_____ Date:___5/15/2015_____

To be completed by the student:

☐ I agree with the comments on my Practicum Project progress provided by my sponsor.

☐ I do not agree with the comments on my Practicum Project progress provided by my sponsor.

Please explain:

Signature of student: _____ Date:_____

DPH PRACTICUM PROJECT FINAL REPORT (Sponsor)

Student name: [redacted]

DPH Track: Health Policy and Management

Practicum sponsor's name: Alice Berger

Practicum Project description (one sentence):
[redacted] is working at Planned Parenthood of New York City to improve the knowledge and build the capacity of family planning providers and other organizations to assist individuals with enrollment in health insurance, including the Medicaid Family Planning Benefit Program (FPBP), the Family Planning Extension Program (FPEP), and the impact of the Affordable Care Act (ACA) on FPBP, FPEP, and coverage and access to family planning and other reproductive health services.

Instructions

The Practicum Sponsor is to complete this report and provide it to the student, for submission to the Instructor. Both the student and the Practicum Sponsor must sign the report. The final version, with signatures, must be submitted via email to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu). Either the Practicum Sponsor or the student may submit the final signed report.

DEADLINE: May 15, 2015

Overall Practicum Project Assessment

Please check the statement which best summarizes the student's Practicum Project work:

- **X** Project completed on schedule with initial Learning Plan
- ☐ Project completed ahead of schedule from initial Learning Plan (describe any adjustments in 1.)
- ☐ Project behind schedule from initial Learning Plan (describe any adjustments in 1.)

Practicum Sponsor's Comments on Student Completion of the Practicum Project

This form is to be completed by the Practicum Project sponsor, after meeting with the student and careful review of the student's work to complete the Practicum Project. The form must then be co-signed by the student.

*Please submit the completed form electronically to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu) and include both the student and the sponsor on the message sent.

1. **Please comment on the student's work over the Practicum Project period, including anything notable about time and effort, quality of work completed, identified strengths and weaknesses, etc.**

   [redacted] is an excellent trainer and has demonstrated a great deal of expertise about FPBP, FPEP, and the impact of the ACA. She has the ability to synthesize complex information in order to explain it in clear and concise terms to an audience with varying levels of knowledge and skill. Conducting education on the ACA has tested her skill of keeping things simple and relevant and she has risen to that challenge. She is also open to constructive feedback. She has improved her activities tracking efforts since we submitted the progress report, so I am confident that it will result in a more meaningful analysis in her own final report.

2. **Please comment on the student's progress towards mastering the competencies s/he identified as relevant to the Practicum Project's stated objectives and activities. This information is presented in the student's detailed Learning Plan.**

   Through this project, [redacted] has mastered the ways in which public policy interventions can be operationalized in the health care setting. She has been able to experience first-hand, how the policy process is implemented as it works is way through an organization's infrastrucure. She has improved her ability to analyze the outcomes of policy decisions on access to health care and coverage. She is also now able to distinguish how policy implementation can vary across health care settings and organizations, depending on the staffing capacity, internal group dynamics, leadership, and patient demographics. [redacted] has been able to read through complex literature, including regulations and subregulations, regarding Medicaid and Title X requirements to understand and evaluate its potential impact. She can then clearly and concisely summarize the literature and provide her own, informed assessment to health care providers.

3. **Has the student met with you to discuss his/her completion of the Practicum Project? Please briefly describe your meetings over the course of the Practicum Project period, any changes, etc. If you have not met, please explain.**

   [redacted] and I meet almost daily to talk about her work. She will update me on her activities and describe both the opportunities and challenges she experienced while doing the trainings and conducting technical assistance. She will then provide her own assessment and reflect on these experiences. I typically offer my own feedback and ask her additional questions. If there are any federal or state policy updates relevant to the project, she and I will discuss first and think about how to implement any new information into the trainings she provides.

Signature of sponsor: Ann Bergel **Date:** 5/11/15

To be completed by the student:

X I agree with the comments on my Practicum Project progress provided by my sponsor.

☐ I do not agree with the comments on my Practicum Project progress provided by my sponsor.

Please explain:

Signature of student: [redacted] **Date:** 5/12/15

DPH PRACTICUM PROJECT FINAL REPORT (Sponsor)

Student name:

DPH Track: Health Policy and Management

Practicum sponsor's name: Petr Sharov

Practicum Project description (one sentence):

Coordination of environmental health intervention project at Digmai Tailings that aims to reduce the radioactive risks of the tailing that poses threats to the life and health of the local population in Goziyon jamoat, B.Gafurov district in Tajikistan..

Instructions

The Practicum Sponsor is to complete this report and provide it to the student, for submission to the Instructor. Both the student and the Practicum Sponsor must sign the report. The final version, with signatures, must be submitted via email to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu). Either the Practicum Sponsor or the student may submit the final signed report.

DEADLINE: May 15, 2015

Overall Practicum Project Assessment

Please check the statement which best summarizes the student's Practicum Project work:

- X Project completed on schedule with initial Learning Plan
- ☐ Project completed ahead of schedule from initial Learning Plan (describe any adjustments in 1.)
- ☐ Project behind schedule from initial Learning Plan (describe any adjustments in 1.)

Practicum Sponsor's Comments on Student Completion of the Practicum Project

This form is to be completed by the Practicum Project sponsor, after meeting with the student and careful review of the student's work to complete the Practicum Project. The form must then be co-signed by the student.

*Please submit the completed form electronically to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu) and include both the student and the sponsor on the message sent.

1. Please comment on the student's work over the Practicum Project period, including anything notable about time and effort, quality of work completed, identified strengths and weaknesses, etc.

   M put in quality time in working on the project. As the project is not completed (as primarily scheduled) her efforts is on-going. During past three months M has successfully coordinated her work with regional consultants. She was always on time to report to Financial Office as well as to me with the monthly documents required for the smooth operation of every part of the project.

2. Please comment on the student's progress towards mastering the competencies s/he identified as relevant to the Practicum Project's stated objectives and activities. This information is presented in the student's detailed Learning Plan.

   M successfully progressed towards mastering her skills in project management and public health policy and management track competencies.

3. Has the student met with you to discuss his/her completion of the Practicum Project? Please briefly describe your meetings over the course of the Practicum Project period, any changes, etc. If you have not met, please explain.

   We met twice a week to discuss progress on the project. We discussed milestones of the project that went on during the week.

Signature of sponsor: _____P.Sharov_____ Date:___05.12.2015___

To be completed by the student:

X I agree with the comments on my Practicum Project progress provided by my sponsor.

☐ I do not agree with the comments on my Practicum Project progress provided by my sponsor.

Please explain:

Signature of student: _____ _____ Date:____ 05.12.2015_

DPH PRACTICUM PROJECT FINAL REPORT (Sponsor)

Student name: [redacted]

DPH Track: Epidemiology

Practicum sponsor's name: Amber Levanon Seligson

Practicum Project description (one sentence):
Report on the Wellness of Supportive Housing Participants

Instructions

The Practicum Sponsor is to complete this report and provide it to the student, for submission to the instructor. Both the student and the Practicum Sponsor must sign the report. The final version, with signatures, must be submitted via email to the seminar instructor (Daliah Heller, daliah.heller@sph.cuny.edu). Either the Practicum Sponsor or the student may submit the final signed report.

Overall Practicum Project Assessment

Please check the statement which best summarizes the student's Practicum Project work:

- [X] Project completed on schedule with initial Learning Plan
- [ ] Project completed ahead of schedule from initial Learning Plan (describe any adjustments in A.VIII.)
- [ ] Project behind schedule from initial Learning Plan (describe any adjustments in A.VIII.)

Note from project sponsor Amber Levanon Seligson: The deliverables for [redacted] practicum included drafting a report about well-being of supportive housing participants, including charts and figures and information about statistical techniques used in analyzing the data; SAS code used to conduct analyses; and data-checking with colleagues in the Program Evaluation Unit. A partial draft of the report has been written. The draft is a "synopsis," meaning that not all parts of the draft are included yet. Sal has made substantial contributions to this synopsis draft, including tables from analyses and information about statistical techniques, he has written SAS code, and he has worked with colleagues to data-check his analyses. Therefore, I consider his practicum work to be complete. He will continue to work on this project to bring the report to completion, and that continued work is outside the scope of the practicum.

Practicum Sponsor's Comments on Student Completion of the Practicum Project

This form is to be completed by the Practicum Project sponsor, after meeting with the student and careful review of the student's work to complete the Practicum Project. The form must then be co-signed by the student.

*Please submit the completed form electronically to the seminar instructor (Daliah Heller, daliah.heller@sph.cuny.edu) and include both the student and the sponsor on the message sent.

1. **Please comment on the student's work over the Practicum Project period, including anything notable about time and effort, quality of work completed, identified strengths and weaknesses, etc.**

Mr [redacted] has made substantial progress in contributing to a valuable draft report that we have been working on in the Program Evaluation Unit of the Bureau of Epidemiology Services. Mr [redacted] has worked very hard to (1) learn about our program evaluation, (2) understand the data that we have available to us, (3) identify Citywide data that need to be used, (4) choose methods for analyses, (5) run analyses, (6) check analyses, and (7) report results.

I have been very impressed by Mr. [redacted]s efforts to undertake this complex project. Although at first glance it may seem that the questions we are trying to ask in the report are simple and the analyses are straightforward, the work to undertake these tasks has actually been very complex. Mr. [redacted] at times has expressed surprise by how long the process has taken for our unit to work through analytic decisions and try different approaches. I am glad that he has remained dedicated to the project and tried different approaches, and has been open to exploring new paths when the paths we have gone down have need to be modified.

Mr [redacted] has been a terrific member of our team. He is an enthusiastic analyst who wants to understand the details of the project and wants his analyses to be done well and using the most appropriate methods and data. I very much appreciate this spirit, and am so glad that we have had a chance to work with him on this project.

2. Please comment on the student's progress towards mastering the competencies s/he identified as relevant to the Practicum Project's stated objectives and activities. This information is presented in the student's detailed Learning Plan.

Mr. [redacted] has made progress in the following areas:

- To understand the requirements of a DOHMH Special Report and help produce the report
  - Mr. [redacted] has been an integral part of our team in deciding about the analyses that need to be conducted about mortality, and how to include them in a report. He has conducted data analyses for the report, worked with colleagues to check those analyses, and written up his results.
- To achieve proficiency in the use of statistical software in an agency setting
  - Mr. [redacted] has worked within our computing environment, and has written SAS code to conduct analyses. He has documented his SAS code, and worked with colleagues to resolve issues in SAS codes when needed so that they agree on results of analyses.
- To learn how to do a thorough analyses of mortality for an at-risk population
  - Mr. [redacted] has explored appropriate methodologies for analyzing mortality, and calculating rates and confidence intervals. He has learned about the detailed decisions that need to be made when a program evaluation population is being compared to city-wide rates or rates in lowest income neighborhoods.
- To evaluate the NY/NY III Supportive Housing intervention
  - Mr. [redacted] has made an important contribution to our efforts to evaluate NY/NY III by conducting a rigorous mortality analysis.

3. Has the student met with you to discuss his/her completion of the Practicum Project? Please briefly describe your meetings over the course of the Practicum Project period, any changes, etc. If you have not met, please explain.

Mr [redacted] and I talk at least once a week about specific elements of the project. We problem-solve about various analytic decisions that need to be made.

Signature of sponsor: _____ Date: 4/22/15

To be completed by the student:

☒ I agree with the comments on my Practicum Project progress provided by my sponsor.

☐ I do not agree with the comments on my Practicum Project progress provided by my sponsor.

Please explain:

Signature of student: [redacted] Date: 4/23/2013

DPH PRACTICUM PROJECT FINAL REPORT (Sponsor)

Student name: [redacted]

DPH Track: Health Policy and Management

Practicum sponsor's name: Yi Han

Practicum Project description (one sentence): This project was conducted by the student to 1) better understand what publically available data sources are available to better understand healthcare utilization and costs among the elderly and 2) analyze and interpret some of this data to prepare for a future publication to share findings.

Instructions

The Practicum Sponsor is to complete this report and provide it to the student, for submission to the Instructor. Both the student and the Practicum Sponsor must sign the report. The final version, with signatures, must be submitted via email to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu). Either the Practicum Sponsor or the student may submit the final signed report.

DEADLINE: May 17, 2015

Overall Practicum Project Assessment

Please check the statement which best summarizes the student's Practicum Project work:

- [X] Project completed on schedule with initial Learning Plan
- [ ] Project completed ahead of schedule from initial Learning Plan (describe any adjustments in 1.)
- [ ] Project behind schedule from initial Learning Plan (describe any adjustments in 1.)

Practicum Sponsor's Comments on Student Completion of the Practicum Project

This form is to be completed by the Practicum Project sponsor, after meeting with the student and careful review of the student's work to complete the Practicum Project. The form must then be co-signed by the student.

*Please submit the completed form electronically to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu) and include both the student and the sponsor on the message sent.

1. **Please comment on the student's work over the Practicum Project period, including anything notable about time and effort, quality of work completed, identified strengths and weaknesses, etc.**

Despite some challenges that [redacted] faced finding an appropriate data source to start, I think this modified exercise was very productive in helping her to take time to explore publically available data around this issue. The table developed will be a valuable reference for future research and can continue to be built upon as more data sources are identified. Further, once [redacted] identified these resources, she took time to go through them to identify what data relevant to her research interests could be extracted/analyzed from these data sets. [redacted] put together a meaningful and quality report for this practicum project and I would be happy to continue to support her through similar work in the future.

2. **Please comment on the student's progress towards mastering the competencies s/he identified as relevant to the Practicum Project's stated objectives and activities. This information is presented in the student's detailed Learning Plan.**

Based on the progress that [redacted] has made on this project, she is certainly closer to mastering the competencies that she identified. All of the competencies around understanding and applying research designs/analysis and data interpretation will be skills that [redacted] will continue to evolve throughout her academic and professional career. Based on [redacted]s findings, we will continue to work together over the summer to translate these learnings into a tangible abstract or publication that can be submitted to a conference or journal (likely ISPOR).

3. **Has the student met with you to discuss his/her completion of the Practicum Project? Please briefly describe your meetings over the course of the Practicum Project period, any changes, etc. If you have not met, please explain.**

Yes, [redacted] and I met to discuss the project at the completion. We went over the key findings and her first draft of the report. Throughout the semester, we met periodically to discuss the project although timing was sometimes a challenge as we travel often for work. After the completion of this practicum project, [redacted] and I plan to continue to meet to create a publication out of this initial work.

Signature of sponsor:  **Date: 5/15/2015**

To be completed by the student:

☒ I agree with the comments on my Practicum Project progress provided by my sponsor.

☐ I do not agree with the comments on my Practicum Project progress provided by my sponsor.

Please explain:

Signature of student:  **Date:** 5/15/2015

DPH PRACTICUM PROJECT FINAL REPORT (Sponsor)

Student name: [redacted]

DPH Track: EOH

Practicum sponsor's name: Jean Grassman

Practicum Project description (one sentence): **Organize a workplace union health and safety committee using issues of workplace hazards stemming from deferred maintenance.**

Instructions

The Practicum Sponsor is to complete this report and provide it to the student, for submission to the Instructor. Both the student and the Practicum Sponsor must sign the report. The final version, with signatures, must be submitted via email to the seminar instructor (Daliah Heller, daliah.heller@sph.cuny.edu). Either the Practicum Sponsor or the student may submit the final signed report.

DEADLINE: May 15, 2015

Overall Practicum Project Assessment

Please check the statement which best summarizes the student's Practicum Project work:

- XX Project completed on schedule with initial Learning Plan
- ☐ Project completed ahead of schedule from initial Learning Plan (describe any adjustments in 1.)
- ☐ Project behind schedule from initial Learning Plan (describe any adjustments in 1.)

Practicum Sponsor's Comments on Student Completion of the Practicum Project

This form is to be completed by the Practicum Project sponsor, after meeting with the student and careful review of the student's work to complete the Practicum Project. The form must then be co-signed by the student.

*Please submit the completed form electronically to the seminar instructor (Daliah Heller, daliah.heller@sph.cuny.edu) and include both the student and the sponsor on the message sent.

1. Please comment on the student's work over the Practicum Project period, including anything notable about time and effort, quality of work completed, identified strengths and weaknesses, etc.

   [redacted] approached the project in a methodical and organized manner. She was diligent in her research: performing analyses, developing summaries, and listing hazards in a timely manner. She approached the work with great enthusiasm and was a pleasure to work with. Her attitude was both critical and constructive. She amply demonstrated leadership skills by taking the lead in group discussions at meetings held at the PSC and at Brooklyn College.

   I would have liked to have had her take a bit more initiative in the direction of some of our activities. In particular, I would have liked her to been able to devise and propose next steps following events such as meetings where we learned about the problems faced by members.

   At least part of the reason for this not happening to a greater extent may be because of the labor union context: I had mentioned early on in the project that she needed to clear activities with me to ensure that the rights and privacy of the members were maintained. One reason this is important is because most CUNY campuses consist of a mixture of non-union Administration, PSC members, and members from other unions. When we work at the campuses, we want the PSC members to trust us with their issues and not alert their supervisors without their permission, something that can easily happen when not knowing the players and their roles.

2. Please comment on the student's progress towards mastering the competencies s/he identified as relevant to the Practicum Project's stated objectives and activities. This information is presented in the student's detailed Learning Plan.

   Based on review of the learning plan, [redacted] completed her learning objectives with the modification described in the mid-semester review where we mutually decided it would be best to focus on Brooklyn College.

   The competencies that [redacted] chose were appropriate for the project and she attained them. Her project drew most from competencies related to policy analysis and advocacy, applying concepts, theories and methods to the study of public health, and leadership/teamwork skills.

She also had opportunity to do research/data collection although the data that was collected was qualitative in nature.

3. Has the student met with you to discuss his/her completion of the Practicum Project? Please briefly describe your meetings over the course of the Practicum Project period, any changes, etc. If you have not met, please explain.

[redacted] and I had a standing meeting every week at the PSC Union Hall on Wednesdays at 4 pm. These meeting were invaluable in maintaining the focus and trajectory of the project. Our last meeting will be on May 20 where we review this document and plan the last activity of the practicum which is encouraging members to contact the Administration about workplace temperature problems.

Signature of sponsor: Jean Haessler **Date:** 5/20/15

To be completed by the student:

☑ I agree with the comments on my Practicum Project progress provided by my sponsor.

☐ I do not agree with the comments on my Practicum Project progress provided by my sponsor.

Please explain:

Signature of student: [redacted] **Date:** 5/20/15

DPH PRACTICUM PROJECT FINAL REPORT (Sponsor)

Student name:

DPH Track: EOH

Practicum sponsor's name: Liz Geltman

Practicum Project description (one sentence):
Cross sectional survey of TENORM health and safety regulation in oil and gas operations

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Instructions

The Practicum Sponsor is to complete this report and provide it to the student, for submission to the Instructor. Both the student and the Practicum Sponsor must sign the report. The final version, with signatures, must be submitted via email to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu). Either the Practicum Sponsor or the student may submit the final signed report.

DEADLINE: May 15, 2015

Overall Practicum Project Assessment

Please check the statement which best summarizes the student's Practicum Project work:

- ☐ Project completed on schedule with initial Learning Plan
- ☐ Project completed ahead of schedule from initial Learning Plan (describe any adjustments in 1.)
- ☐X Project behind schedule from initial Learning Plan (describe any adjustments in 1.)

Practicum Sponsor's Comments on Student Completion of the Practicum Project

This form is to be completed by the Practicum Project sponsor, after meeting with the student and careful review of the student's work to complete the Practicum Project. The form must then be co-signed by the student.

*Please submit the completed form electronically to the seminar Instructor (Daliah Heller, daliah.heller@sph.cuny.edu) and include both the student and the sponsor on the message sent.

1. Please comment on the student's work over the Practicum Project period, including anything notable about time and effort, quality of work completed, identified strengths and weaknesses, etc.

H worked as a member of our TENORM study group. There were five team members, including myself.

H conducted the initial literature review while the other three students researched health and safety regulations for TENORM in the oil and gas industry. Our focus was on residential and worker safety protections for those working in or living by the extraction industry as well as those exposed to oil and gas wastes at landfill, POTWs and other locations accepting wastes that might include TENORM.

Three EOHS MPH candidate coders collected law, regulation and policy concerning TENORM using the LEXIS/NEXIS database and coded the results in LawAtlas Workbench, a software variation of Atlas.ti that was developed bytthe Network for Public Health Law Research and the Robert Wood Johnson Foundation. The coders copied relevant portions of law or regulation into LawAtals to support the coding. My instructions was to be overinlcusive when copying material, with the expectation that we would edit out irrelevant materials as the study progressed. The three coders traded states and verified coding. The three coders then did a search of state and local websites looking for policies not included in LEXIS/NEXIS. The team met weekly to discuss coding discrepancies. The team also discussed changes in coding policy as dictated by research results

H acted as naïve coder verifying the coding of all 50 states for the three prior coders. His research was exhaustive and differed significantly from the three prior coders on many states.

In order to prepare the TENORM study for publication, the three coders were asked to edit the entries in LAwAtlas so only the relevant laws or regulations would appear. The coders were also instructed to be sure the font, citation and syntax were uniform from state to state throughout the data set. H was put in charge of preparing the project for publication.

Once the above is complete, the final portion of the dataset requires preparation of a codebook, protocol and report.

The codebook is largely self-generated by LawAtlas, but must be edited.

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2. Please comment on the student's progress towards mastering the competencies s/he identified as relevant to the Practicum Project's stated objectives and activities. This information is presented in the student's detailed Learning Plan.

H completed a thorough literature review outlining the health issues concerning TENORM.

H's reading of the laws and regulations differed significantly from the other three coders. Rather than taking a week or two to complete the naïve coding, the process evolved into over two months and is still not complete. I plan to review the items state by state this summer to determine whether the H's concerns were insightful or without merit.

H had difficultly supervising the master's students to standardize citation in workbench and be sure only relevant materials were included as supporting documentation. While he raised concerns about coding, he had difficulty suggesting alternative methods to convey the data in a way that met his concerns.

At this writing, the study is delayed. Issues still need to be clarified as H's interpretation on many coded items disagree from the prior three coders. The text of the law/regulations in LawAtlas still need to be edited to be uniform and the citation must also be corrected. The protocol book needs to be created, as does the final report.

The project was not able to proceed to writing the report for publication on LawAtlas or to drafting an article for publication as the process of naïve coding took significantly longer than expected and is still not complete.

H did a significant amount of work on this project and did an outstanding job of assembling the materials he and his team members drafted this semester into a final report.

3. Has the student met with you to discuss his/her completion of the Practicum Project? Please briefly describe your meetings over the course of the Practicum Project period, any changes, etc. If you have not met, please explain.

Yes, the team met almost weekly. H was an active participant in the meetings, usually arrived early and never missed a meeting.

Signature of sponsor: ___s/ Liz Geltman_____Date:__5/15/15_____

<u>To be completed by the student:</u>

☐x I agree with the comments on my Practicum Project progress provided by my sponsor.

☐ I do not agree with the comments on my Practicum Project progress provided by my sponsor.

Please explain:

While I agree with the comments, I would like to elaborate on a few details:

I was approaching the code questions not with fresh eyes like the three group members but with a lot of experience and technical background behind me on the subject. Naturally, my background in the field has influenced my judgment in many ways during the project.

I would like to mention that I have been in the field of radiation control for over 20 years and I am also a Certified Health Physicist by the American Board of Health Physics. As a Health Physicist (also referred to as a radiation protection specialist), I am expected to address a number of health and safety issues arising from a variety of radiation sources (for which TENORM is only one piece) including their regulatory implementation. In all my experience, radioactive materials are regulated more or less in the same way under the same general structure and regulatory instruments (through licensing, inspection, standards of protection, exemption, exclusion etc.). Thus, I was approaching the problem in the practicum project with this mind set while the other members were looking at it free from any bias. Therefore, I believe such a wide discrepancy between the rest of the project team and I should be expected.

I agree with Prof. Geltman on the point about my difficulty on suggesting alternative methods. Looking back, I should probably have followed a more assertive approach in conveying my messages. However, the question of whether there should be industry specific TENORM law (in this case for oil and gas) instead of a general TENORM law, irrespective of its origin, has been an ongoing discussion and not specific to this project. As such, my background dictated me to follow a non-industry specific approach in the coding process as opposed to what the group generally believed. In this regard, I agree I had difficulty convincing the merits of my approach to anyone but in the end I decided to follow the position of the group, the result of which was a delay in the project. Nevertheless, Prof. Geltman's position to verify whether or not my concerns have merits is reasonable. I believe where and how my concern came from will be taken into consideration in verifying the position I took on the different TENORM issues.

Signature of student: _____ _____ Date:___05/15/2915_____

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Brooklyn College
Department of Health and Nutrition Sciences

HNSC 7920X: Supervised Fieldwork in Public Health

3 Credits - Fall 2015

Time and location	Thursdays, 6:30-9:00 – Room 3424 Ingersoll Hall
Instructor	Bill Stackhouse, Ph.D. Adjunct Assistant Professor **Best to contact by email.** • Office: Ingersoll 4423 • Phone: 718.951.5000 x5026 (leave a message & you'll get a call or e-mail response) • E-mail: RWStackhouse@brooklyn.cuny.edu
Office hours	By appointment – before or after class.
Course website	https://bbhosted.cuny.edu/webapps/blackboard/
Support resources	For technical assistance, contact the Helpdesk. Academic support services writing skills assistance are available.
Course description	Students carry out 180 hours of supervised field work that is intended to bridge academic preparation and public health practice. Knowledge and skills from the core MPH and specialization courses are applied in a public health agency, community organization or other setting relevant to the student's academic background, specialization and career expectations. This is accomplished under the supervision and guidance of an experienced preceptor. Field-based hours are implemented with classroom and individual meetings along with online communication. Aside from deliverables required by the preceptor, the student develops a reflection paper, a self-evaluation and a capstone proposal.
Course prerequisites	Completion of at least 18 MPH credits that include Health and Nutrition Sciences 7120X, Health and Nutrition Sciences 7150X, and two courses in the student's area of specialization.
Course format	Supervised individual internship projects in a community program or health agency. Weekly seminars, except when noted in the posted schedule. NOTE: the Internship Manual for Fall 2015 is an official part of this syllabus.
Required reading	There is no required textbook. Weekly reading assignments

and resources	appear following the class schedule herein. Articles and other materials will be posted on BlackBoard.
Suggested reading and resources	Optional reading materials and learning resources will be posted to BlackBoard, particularly in relation to current newsworthy topics in public health.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Apply the public health core functions of assessment, policy development and assurance	• Demonstrate (e.g. through the portfolio) the application of assessment, assurance and/or policy development during the fieldwork experience.	• Addressed in: Classes - 1,2,3,4,5, & internship placement • Assessed in: Learning objectives, Logic model, Gantt chart, all 3 reflection papers
2. Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Demonstrate through self-reflection activities the application of one or more core PH values or techniques through the fieldwork experience	• Addressed in: 1,2,3,4,5 & internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, poster, all 3 reflection papers, poster presentation
3. Adhere to ethical and social justice principles and standards	• Apply ethnical principles to fieldwork placement, (e.g. human subjects' protection principles to the data collection). • Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards	• Addressed in: 4 and internship placement • Assessed by: Reflection paper 1
4. Interpret and analyze public health literature and apply evidence-based research	• Demonstrate (e.g. through the portfolio) the application of findings from public health literature to the field work experience	• Addressed in: 1,2,3,4,5,6,7 & internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, poster, all 3 reflection papers, poster presentation
5. Apply basic statistical and informatics techniques	• Participate, through the fieldwork experience, in using statistical and informatics techniques to support a public health program or policy in it's provision and effectiveness.	• Addressed in: Internship placement – when required in the internship setting and experience • Assessed by: poster presentation and poster
6. Communicate public health information through oral, written, digital and visual presentation	• Prepare written and oral progress and evaluation reports (e.g. the fieldwork project), using appropriate professional formats.	• Addressed in: 10, 11, 13, 14 & Class participation and internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, abstract, all 3 reflection papers, poster presentation and poster
7. Explain how social, behavioral, biomedical and environmental determinants affect population health	• Apply the elements of social, behavioral, biomedical and environmental determinants of and inequities in health and disease to aspects of the provision of public health activities in the internship settings and activities.	• Addressed in: 2,3,4,6,9 & internship placement • Assessed by: Logic Model, reflection paper 1, poster presentation and poster

8. Design and evaluate interventions to prevent or control public health problems	• Participate, through the fieldwork experience, in developing, carrying or evaluating out a public health program, remediation measure or policy.	• Addressed in: Internship placement – when required in the internship setting and experience • Assessed by: Learning objectives, Logic model, Gantt chart, abstract, all 3 reflection papers, poster presentation and poster
9. Collect, analyze and interpret public health data	• Participate, through the fieldwork experience, in collecting, analyzing and interpreting public health data to support a public health program or policy in it's provision and effectiveness.	• Addressed in: Internship placement – when required in the internship setting and experience • Assessed by: poster presentation and poster
10. Engage and collaborate with diverse groups	• Identify different stakeholders and evaluate their roles on the fieldwork project.	• Addressed in: 2,4,5,7,& internship placement • Assessed by: summary paper, poster presentation and poste
11. Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Apply the elements of public health core elements, infrastructure, and delivery to aspects of the provision of public health activities in the internship settings and activities.	• Addressed in: 2,3 & internship placement • Assessed by: reflection paper 1
12. Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project	• Addressed in: 1,2,3,4,10, & internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, summary paper
13. Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Discuss how the agencies you worked with during your fieldwork experience deliver health care to the populations they serve.	• Addressed in: 2,3,6,7,9,10 & internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, poster, all 3 reflection papers, summary paper, poster presentation and poster

Course Assessments

The following summary of course assignments & assessments will be presented by the five major required elements of the course work:

1. Field work/Internship
2. Attendance/participation
3. Reflection Papers
4. Supporting and Summary documents
   (Contract elements, learning objectives, Gantt, Logic Model, Summary)
5. Poster/Oral presentation

Additional detailed instructions regarding the arrangements for the internship and the assignments can be found in the Internship Handbook available at the BlackBoard.

All assignments are to be submitted electronically through BlackBoard.

1. Field Work/Internship:
   The internship grade will based on the quality of the contract elements that are submitted, field supervisor comments, assessment of the quality of your service and difficulty of the placement (midpoint and final reviews). **Students should have secured an internship before the first class. Failure to do so may compromise the delivery of timely products and course standing.**

   A. Contract elements include:
   (see class schedule below for due dates)

   - Student information form (available electronically on Blackboard)
   - Supervisor information form (available electronically on Blackboard)
   - Signed student/supervisor agreement form (submitted as a pdf of the signed copy of the last page of the manual)
   - *Approved learning objectives**
   - *Approved logic model** (see: http://www.wkkf.org/knowledge-center/resources/2006/02/WK-Kellogg-Foundation-Logic-Model-Development-Guide.aspx) (Also, use the sample format available on Blackboard)
   - *Approved Gantt chart** (Use the sample format available on Blackboard)
   - *Human Subjects Basic Course* – Complete the Human Subjects Basic Course at the Collaborative Institutional Training Initiative (CITI) online site: https://www.citiprogram.org/ In creating your individual user login account when asked for the institution indicate CUNY, then follow the prompts to set up your account. After establishing your account you will be able to complete the online course for free. Submit the PDF certificate confirming completion.

- Proof of professional liability insurance (for students not working within another office/department of their current employer). Students should research the best option. Look for student packages for 1 semester covering liability between $1m/$3m. Two possibilities are described in the Manual (note: these are not endorsements).
- *Abstract**. First draft. See manual.
  *Note-Professor will review one draft. The next & final iteration will be graded.

Contract elements not due within first three weeks include:

- *Final Abstract** see guidelines in the Manual. This must be submitted by the last class.
- Approved Inter-agency affiliation agreement. This is to be completed and executed before the end of the course. An electronic copy must be given to Barbara Allier, copy to Professor Stackhouse using Blackboard. (Template available at: http://web.cuny.edu/academics/info-central/wwww/affiliation-agreements.html)

B. Midpoint review. Described in detail in the Manual.

- Student mid-point self evaluation, signed by supervisor. (Available on Blackboard).

C. Final Evaluation. Described in the Manual.

- Student Fieldwork Site Evaluation Form (Available on Blackboard). To be submitted electronically to Barbara Allier, copy to Professor Stackhouse using Blackboard.
- Completed timesheets – MPH students must document completion of 180 hours. (Blank forms Available on Blackboard) – Multiple pages with a cover summary page should be scanned to one PDF document with signatures and submitted electronically to Professor Stackhouse using Blackboard.
- Field supervisor final evaluation of student (The final evaluation form will be emailed to the site supervisor by Professor Stackhouse one week before the end of classes and returned to Professor Stackhouse). Note, failure of the supervisor to return the completed evaluation before grades are due may result in a delay of grade submission.

D. Guidelines for all materials to be submitted in fulfillment of course requirements noted above.

  - In addition to the detailed instructions for materials found in the Fieldwork Handbook the following standards apply:
  - The Reflection Papers & the Summary Document should have a title, your name, the date submitted, and include an

introduction, body and conclusion. These documents should be paginated.
- As noted in the Handbook, any time a reference is made the APA reference format is required.
- **All materials submitted** are required to have a document name using the following naming convention (This holds for all types of saved electronic documents – MSWord, Excel, PDF, or any other):
    - Last name.First initial. document name.MM.DD.YR (sample below)
    - Smith.M.ReflectionPaper1.09.15.15

2. Attendance:
   Attendance is mandatory and absences will result in reduced credit unless excused before the class by email; please arrive on time and make sure that all cell phones are silenced.

3. Reflection papers:
   Purpose of each reflection paper is to structure and organize student's learning experience against stated learning objectives, to facilitate synthesis of field activities, and to facilitate integration of theory and practice. Each reflection paper must be submitted to Professor Stackhouse using Blackboard by the end of the day (11pm) on the due date. Late papers will not be accepted unless cleared with Professor Stackhouse in advance. Paper are: #1 – Core Functions of Public Health, #2 – Evidence Based Public Health, and #3 – Leadership VS Management. Please see the manual for further instructions.

4. Summary document/evaluation:
   This summary should be at least a five page overview that critically describes your internship responsibilities, and major findings. The summary should be more than a description of what you did, it should contain insights about unexpected learnings and looking back, what you might have done differently. To be clear, admitting that an internship was not perfect is not a weakness. Indeed, identifying potential areas for improvement (either your own or the organization's) is at the core of what the internship is meant to deliver. **If you have produced a report, document or other final product(s) during your work at the internship, it (they) should be referenced and attached as an appendix. The final document should include itemized references to your learning objectives and clearly identify progress made and challenges faced.**

5. Posters:

Posters & their presentation represent a public display of your internship. Detailed instructions for the poster format appear in the Manual. Samples of posters from previous classes will be available at the BlackBoard along with a blank format for your use. Arrangements will be made with the Brooklyn College Library to print the posters at a discounted price. Note: this must be a professional poster. Posters not meeting professional expectations will not earn a passing grade.

Grading

Evaluation criteria

All assessment elements will be assigned a percentage grade & the final grade will be based on the combined grades based on their percentage weights.

The relative weight of each course component is as follows:

Assessment	Weight
Field Work	30%
Attendance/Participation	10%
Three Reflection Papers	30%
Supporting & Summary Documents	20%
Poster and Oral Presentation	10%
FINAL GRADE	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Graduate Bulletin and the Program Director for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

Attendance is a significant requirement of the class & attendance will be taken at each session. Students are expected to have read the assignments prior to the class and come prepared for discussion of the materials in relation to the in class presentations by Professor Stackhouse.

Late/incomplete submission of assignments

Late or incomplete submission of assignments will be accepted if there is a specific advance approval given by Professor Stackhouse. Assignments submitted late without advance approval within one week of the due date will be accepted & graded and the grade will be dropped by 10 percentage points. Note – BlackBoard gives documentation of the date and time that assignments are submitted.

Make-ups, rewrites, and extra credit

Make-ups and rewrites are not allowed. However, it should be noted that for the "Contract Elements" a first draft is submitted & returned with detailed feedback. The final copies of these items submitted three weeks after the first draft will be graded. The class does not offer extra credit opportunities

Expectations of students

Students are expected to be in class on time & to be prepared by having read the assigned materials. Mobile devices should be silent. No texting during class is allowed. If a topic arises in class discussion that may benefit from an online search, this will be

acceptable. In general laptops, tablets & smart phones should only be used to view saved electronic copies of class materials. Students will respect each other & fully participate in class discussions.

Expectations for the instructor

Students can expect respectful and professional interaction by Professor Stackhouse. He will post the PowerPoint presentations planned for class sessions one day prior to the class. All class assignments will be reviewed and comments/feedback will be offered within the BlackBoard system in a timely manner. Detailed “track changes” edits and comments will be given to written materials submitted. These are given not to suggest edits or rewrites but to offer feedback to students in relation to ways to improve future assignments. Professor Stackhouse will check Brooklyn College email approximately 4x a week & respond as soon as he is able.

Accessibility

In order to receive disability-related academic accommodations, students must first register with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell, at (718) 951-5538. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Academic integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Brooklyn College procedure for implementing the policy can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

Course Schedule *(Schedule is subject to change)*

Class Meetings HNSC 7920 – Fall 2015 (Thursdays 6:30-9:00pm)

1 – Aug 27 Introduction to Class; expectations, role, planning for the internship

2 – Sept 3 Public Health Core Functions

X – Sept 10 (No Class) College on Monday Schedule

3 - Sept 17 Public Health Infrastructure and Delivery
(First draft of all "Contract Elements" - *due 9/16*- letter A)

4 – Sept 24 Ethics and Methods (including community-based participatory research & human subjects' protection principles in data collection)

5 – Oct 1 Evidence Based Public Health Education (Reflection Paper #1 - *due 9/30*: Core functions)

6 – Oct 8 Public Health in Practice I: An in-depth review of Health Education to address Asthma (Final drafts of "Contract Elements" - *due 10/7- except final abstract*)

7 – Oct 15 Challenges and Opportunities: Internship at the Midpoint (Reflection Paper # 2 - *due 10/14*: Evidence Based Public Health)

8 – Oct 22 No Class to be held - Individual appointment will be scheduled in the classroom with the Instructor and mid-point check in with your supervisor. All midpoint reviews should have been electronically submitted.

9 – Oct 29 Public Health in Practice II: An in-depth consideration of two current topics in health education: Lay Health Workers & Online Health Literacy

10 – Nov 5 Leadership vs. Management: "Getting from the dance floor to the balcony"

11 – Nov 12 Making Presentations and Resumes and professional development (Bring 2 hardcopies of your resume.)

12 – Nov 19 Organizational change (Reflection Paper # 3 - *due 11/18*: Leadership vs Management)

X – Nov 26 (No Class) College Closed – Thanksgiving Holiday

13 – Dec 3 Individual scheduled presentations of Internships, Posters (session I)

14 – Dec 10 Individual scheduled presentations of Internships, Posters (session II)
(Summary papers, final documents and revised Abstract - *due 12/9*)

15 – Dec 16 - 23 Final Exams Period

- September 2 - Last day to add a class
- September 17 - Course withdrawal period begins / November 7 – withdrawal period ends

Reading Assignments

Sept 3 - Public Health Core Functions:

Ford, E.W., W.J. Duncan, and P.M. Ginter, *Health departments' implementation of public health's core functions: an assessment of health impacts.* Public Health, 2005. **119**(1): p. 11-21.

Levi, J., Juliano, C., Richardson, M. *Financing Public Health: Diminished funding for core needs and state by state variation in support.* Journal of Public Health Management & Practice, March/April 2007. **13**(2): p 97-102.

Rothstein, M.A., *Rethinking the Meaning of Public Health.* Journal of Law, Medicine & Ethics, 2002. **30**(2): p. 144-149.

Sept 17 - Public Health Infrastructure and Delivery:

Baker, E.L., Jr. et al, *The Public Health Infrastructure and Our Nation's Health. Annual Review of Public Health*, 2005. **26**:p. 303-318.

Mays, Glen P. et al, *Public Health Delivery Systems- Evidence, Uncertainty, and Emerging Research Needs*. American Journal of Preventive Medicine, 2009. **36**(3), p. 256-265.

Mays, Glen P, D. Scutchfield, M.W. Bhandari, and S.A. Smith, *Understanding the Organization of Public Health Delivery Systems: An Empirical Typology*. The Milbank Quarterly, March 2010. **88**(1): p. 81-111.

Sept 24 - Ethics and Methods:

Stone, D., *Policy Paradox:* The Art of Political Decision Making. 1997, NYC: W.W. Norton & Company. Chapter 2.

Callahan, D. and B. Jennings, *Ethics and Public Health: Forging a strong relationship.* American Journal of Public health, 2002. **92**(2): p. 169-176.

Bayer, R., *Ethics of Health Promotion and Disease Prevention*, in *Ethics and Public Health: Model Curriculum*, B. Jennings, et al., Editors. 2003, Association Schools of Public Health: Washington.
http://www.asph.org/UserFiles/Module6.pdf

Shore, N., Park, A., Castro, P., Wat, E., Sablan-Santos, L., Isaacs, M.L., Freeman, E., Cooks, J.M., Drew, E., Seifer, S.D. *Redefining Research Ethics Review: Case Studies of Five Community-Led Models*. Seattle, WA: Community-Campus Partnerships for Health, 2014.

Oct 1 - Evidence Based Public Health:

Brownson, R.C., J.E. Fielding, and C.M. Maylahn, *Evidence-Based Public Health: A Fundamental Concept for Public Health Practice.* Annual Review of Public Health, 2009. **30**(1): p. 175-201.

Rychetnik, L., et al., *Criteria for evaluating evidence on public health interventions.* Journal of Epidemiology and Community Health, 2002. **56**(2): p. 119-127.

Collins, C., Phields, M.E., Duncan, T. *An agency capacity model to facilitate implementation of evidence-based behavioral interventions by community based organizations.* Journal of Public Health management Practice, 2007. January Suppl. S16-S23.

Oct 8 - Public Health in Practice I: An in-depth review of Health Education to address Asthma:

Bailey, E.J., Cates, C.J., Kruske, S.G., Morris, P.S., Brown, N., and Chang, A.B. *Culture-specific programs for children and adults from minority groups who have asthma (Review*). The Cochrane Library, 2009, Issue 2.

Tapp, S., Lasserson, T.J., and Rowe, B.H. *Education interventions for adults who attend the emergency room for acute asthma (Review)*. The Cochrane Library, 2007, Issue 3.

Oct 29 - Public Health in Practice II: An in-depth consideration of two current topics in health education: Lay Health Workers & Online Health Literacy:

Lewin, S., Munabi-Babigumira, S., Glenton, C., Daniels, K., Bosch-Capblanch, X., van Wyk, B.E., Odgaard-Jensen, J, Aja, G.N., Zwarenstein, M., and Scheel, I.B. *Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases (Review*). The Cochrane Library, 2010, Issue 3.

Car, J., Lamh, B., Colledge, A., Ung, C. and Majeed, A. Interventions for enhancing consumers' online health literacy (Review). The Cochrane Library, 2011, Issue 6.

Nov 5 - Leadership vs. Management:

Mintzberg, H., *Governing management.* Harvard Business Review, 1996. **May-June**: p. 75-83.

Heifitz, R.A. and D.L. Laurie, *The work of leadership.* Harvard Business Review, 1997. **Jan-Feb**: p. 124-134.

Wright, K., et al., *Competency development in public health leadership.* American Journal of Public Health, 2000. **90**(8): p. 1202-1207.

Nov 12 - Resumes and professional development:
Resumes:
http://www.sph.unc.edu/student_affairs/revamp_your_resume_and_cv_3312_4585.html

Interviewing:
http://www.boston.com/jobs/bighelp2008/fall/common_interview_mistakes/?s_campaign=8315

Nov 19 - Organizational change:
Michie, S. and M.A. West, *Managing people and performance: An evidence based framework applied to health services organizations.* International Journal of Management Reviews, 2004. **5/6**(2): p. 91-111.

Fernandez, S. and H.G. Rainey, *Managing Successful Organizational Change in the Public Sector.* Public Administration Review, 2006. **March/April**: p. 168-176.

Boyne, G.A., *Sources of Public Service Improvement: A Critical Review and Research Agenda.* Journal of Public Administration Research & Theory, 2003. **13**(3): p. 367.

HUNTER COLLEGE OF THE CITY UNIVERSITY OF NEW YORK
THE SCHOOLS OF THE HEALTH PROFESSIONS
HUNTER-BELLEVUE SCHOOL OF NURSING

Spring 2015

NURS 771 – COMMUNITY HEALTH NURSING 1
5 credits: 30 hours of theory, 15 hours of seminar and 166 hours of clinical
Tuesday 3:00PM - 3:50PM: Seminar
4:10PM - 5:50PM: Theory

Pre or co-requisites: NURS 700, NURS 702, and NURS 749

Faculty: **Judith Aponte, PhD, RN, CDE, CCM, APHN-BC**
Office: **Room 430**
Telephone: **(212) 481-7568**
Office hours: **Tuesday 3PM-5PM and by appointment**
E-mail: **jap@hunter.cuny.edu**

Course Description
Identification of skills for Advanced Public Health Nurses to conduct a health-related community needs assessment, participate on interdisciplinary teams in partnership with diverse consumers, and apply principles of Continuous Quality Improvement (CQI).

Expanded Description
Analysis of different models of public health, including core public health functions and standards of practice. Principles of cultural competence, social marketing, advocacy, and service-learning are applied to enhance the health of diverse communities. Health screening and counseling strategies are explored. Ethical/legal tensions between an individualist and public health perspective are examined. A global health perspective is applied.

Course Objectives
1. Apply concepts from nursing and public health to develop the practice role of Advanced Public Health Nurse.
2. Use an evidence-based community health assessment framework to collect, analyze, and evaluate findings.
3. Apply principles of cultural competence, service-learning, and evidence-based practice to promote the health and wellness of culturally diverse communities.
4. Use a variety of health communication and social marking strategies to develop sustainable programs that promote health of an identified community.
5. Apply the principles of Total Quality Management/Continuous Quality Improvement (TQM/CQI) in diverse community settings.
6. Analyze how public health and individualistic ethical/legal models impact on advocacy in working with diverse populations.
7. Apply a global perspective in identification of relevant community interventions.

Teaching Strategies
- Lecture/discussion
- Preceptored clinical placement
- Presentations
- Seminar discussions

Evaluation Methods

- Clinical Practicum-167 clinical hours documented via logs (Pass/Fail)
- Participation in on-line class and Seminar 15%
- Community Health Assessment Paper-Group assignment 30%
- Community Health Assessment Log 10%
- Population Assessment Presentation 20%
- Key Informant Interviews 25%

Required Texts

Anderson, E.T, & McFarlane, J. (2014). *Community as partner: Theory and practice in nursing* (7th ed). Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins. (ISBN: 13-978-1451190939 ISBN-10 – 1-45119093X)

American Psychological Association. (2010). *Publication manual.* (6th ed.). Washington, DC: American Psychological Association. (ISBN-13-978-1-4338-0561-5)

Content Outline

Date	Lecture Topic	Seminar wk	Seminar Topic
02/03	- Introduction to the course: objectives and requirements - Overview of Community Health Nursing/Public health Nursing - Quad Council competencies - Core functions of public health	Week 1-group seminar	Introductions
02/10 Chapter 11	-Community-centered nursing practice: The individual, family, aggregate and community - Health and health disparities	Week 2	Assessment
02/17 Chapter 2	-Philosophy of health, community, community health, community health nursing -Philosophy of public health nursing and population	Week 3	Population Diagnosis and Priorities
02/24 lecture and seminar is on-line Chapter 7	-Caring for culturally diverse communities -Culturally competent community nursing care -Developing culturally competent interventions	Week 4-online	Article-Community/public health nursing: Is there a future for the specialty?
03/03 Chapter 11	-Conducting a community health assessment	Week 5	Outcomes Identification
03/10 Chapter 3 & 12	-Analyzing community health assessment data -Interpreting statistical and epidemiological data and measures	Week 6	Planning
03/17 Chapter 13 & 14	-Planning and implementing a community health Program	Week 7	Implementation
03/24	No class to exchange for attending the Forum	Week 8-0nline	Ethics case study
03/31 Chapter 1	-Global Health and Implications-guest speaker	Week 9	Evaluation
04/14 Chapter 8	-Healthy Public Policy-guest speaker	Week 10	Education/ Evidenced-based practice and research/Quality of practice
04/21	-Risk communication -Evidence-based practice	Week 11	Communication/Leadership/ Collaboration

04/28 Chapter 4	-Environmental health-Guest Speaker	Week 12	Professional Practice Evaluation/Resource Utilization
05/05 lecture and seminar is on-line	Online class	Week 13-online	Environmental Health case study
05/12 Chapter 5 & 6	-Public Health ethical principles -Social justice -Access to health care issues	Week 14	Advocacy
05/19	Presentations	Week 15	Continuation of Lecture Presentations

Important Websites
Association of Community Health Nursing Educators - http://www.achne.org
Healthy people 2020 - http://www.healthypeople.gov
National Center for Health Statistics – http://www.cdc.gov/nchs
National Library of Medicine – http://www.nlm.nih.gov/
New York City Department of Health & Mental Hygiene -http://www.nyc.gov/health
Occupational Safety & Health Administration – http://www.osha.gov
United States Department of Health and Human Services – http://www.hhs.gov
Agency for Toxic Substances and Disease Registry (ATSDR)- www.atsdr.cdc.gov
Centers for Disease Control and Prevention (CDC)- www.cdc.gov
Environmental Protection Agency (EPA)- www.epa.gov
Institute of Medicine (IOM)- www.iom.edu
National Institute of Health (NIH)- www.nih.gov

ATTENDANCE POLICY
Students are expected to attend class weekly. If they miss a class due to illness or unexpected circumstances, it is their responsibility to obtain information regarding missed content.

ACADEMIC INTEGRITY STATEMENT
"Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures."

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES:
In compliance with the ADA and with Section 504 of the Rehabilitation Act, Hunter is committed to ensuring educational access and accommodations for all its registered students. Hunter College's students with disabilities and medical conditions are encouraged to register with the Office of AccessABILITY for assistance and accommodation. For information and appointment contact the Office of AccessABILITY located in Room E1214 [on the 68th St. campus] or call (212) 772-4857 /or VRS (646)755-3129.

POLICY ON STUDENT USE OF RECORDING DEVICES:
The student use of any video recording devices (including cameras) in any classroom, laboratory or clinical setting is strictly prohibited. (The only exception is when the use of such equipment is expressly authorized by the instructor as part of a class assignment or other assigned class activity). The student use of audio recording devices in any classroom or laboratory is allowed only with the permission of the faculty member, which may be granted or denied at the faculty member's discretion. Student use of audio recording devices in the clinical setting is allowed with the permission of the instructor only if it is consistent with facility policy.

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HUNTER COLLEGE OF THE CITY UNIVERSITY OF NEW YORK
HUNTER-BELLEVUE SCHOOL OF NURSING

Fall 2015

Course Number:	**Title:**	**Hours:**	**Credits**
NURS 772	Community/Public Health Nursing II	30 hrs theory, 15 hrs seminar & 167 hrs clinical	5 cr.

Prerequisites: NURS 771

MEETS: Tuesdays Theory: 5:10-6:50pm Seminar: 7:00-8:00pm

FACULTY: Judith Aponte, PhD, RN, CCM, CDE, APHN-BC
Office: Room 430
Telephone: (212) 481-7568
Office hours: Wednesday 4pm-6pm and by appointment
E-mail: jap@hunter.cuny.edu AND judithapo@aol.com
Office hours: Tuesdays 2:00-3:00pm, Wednesdays 5:00-6:00pm

Marcin Dzialo, MS, RN
Adjunct Clinical Instructor
Instructor mdzialo@hunter.cuny.edu
212-203-7853

Camille Hamilton, MS/MPH, RN, CMSRN
Adjunct Clinical
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Adjunct Clinical
Instructor llieto@hunter.cuny.edu
914-844-7553

Course Description

Identification of skills for Advanced Public Health Nurses to conduct a health-related needs assessment for a specific aggregate, analyzes community-based health-related policy, and builds sustainable coalitions with diverse partners.

Expanded Description

Healthy People 2020 objectives including the Action Model to Achieve Healthy People 2020 Overarching Goals are applied. Principles of risk communication with vulnerable populations are analyzed. Health screening programs including internet-based interventions are evaluated. Unique issues related to immigrant health are explored. Role development of Advanced Public Health Nurses is examined including application of technology.

Course Objectives

1. Use the Healthy People 2020 model to assess the health-related needs of a specific aggregate, identify a priority need, and begin to develop a program to address that need.
2. Analyze how health policies impact on diverse aggregates and communities.
3. Work with relevant coalitions to ensure implementation of ethical and legal health-related policies in diverse communities.
4. Apply principles of risk reduction when working with diverse aggregates and communities to increase knowledge and skills to promote self-care and healthy behaviors.
5. Analyze the effectiveness of different health screening interventions in diverse communities.

6. Evaluate the health status of immigrant communities through a global/local perspective.
7. Evaluate how technology impacts on the health status of diverse communities.

Teaching Strategies

- Lecture/Discussion
- Blackboard Assignments
- Audio-visuals (Powerpoint)
- On-line Exercises
- Written Assignments

Method of Evaluation:

- Aggregate Health Promotion Intervention Assignment (20%) maximum 6 pages
- Partnership Assignment (20%) maximum 6 pages
- Program Development and Evaluation Assignment (20%) maximum 5 pages
- Program Development and Evaluation Presentation (15%)
- Blackboard assignment (20%)
- Scholarly participation (5%)

Content	
Week	Content Description
Week 1 (09/01/15)	• Introduction, review of course description and assignments • Core Functions of Public Health • Aggregate assessment • Identification of need/gap using population and aggregate epidemiological data
Week 2 (09/08/15)	• **GUEST SPEAKER** New York City Emergency Management & Preparedness
09/15/15 & 09/22/15	**NO CLASS**
Week 3 (09/25/15) FRIDAY FOLLOWING A TUESDAY SCHEDULE On-line lecture and seminar	• Program development to address need/gap • Integrating health education principles • Educational models
Week 4 (09/29/15)	• Principles of coalition building • Strategies for coalition-building • Types of coalitions • Identification of coalitions related to aggregate need
Week 5 (10/06/15) Assignment Due	• Interventions • Effectiveness of specific health screening programs • Using technologies such as text messaging, internet
Week 6 (10/13/15) On-line lecture and seminar	• CQI
Week 7 (10/20/15)	• Coalition building & Policy Change

Week 8 (10/27/15) Assignment Due	• Policy analysis • When and who developed the policy? • Are there historical issues related to the policy? • Who were the stakeholders when the policy was implemented?
Week 9 (11/03/15)	• Program development, implementation and evaluation • Policy and advocacy
Week 10 (11/10/15) On-line lecture and seminar	• Ethics/Policy
Week 11 (11/17/15)	**No class in exchange to attending Spring Forum lecture**
Week 12 (11/24/15) On-line lecture and seminar Logic model	• Quality Improvement
Week 13 (12/01/15) Assignment Due	• Evaluation of Health Promotion Program
Week 14 (12/08/15)	• Evaluation of Health Promotion Program (continued)
Week 15 (12/15/15)	• Presentations

Required Weekly Readings

Week 1 (09/01/15)

ATSDR Action Model. http://www.atsdr.cdc.gov/sites/brownfields/docs/ATSDRActionModel.pdf.

Bleich, M.R. (2011). IOM report, The future of nursing: Leading change, advancing health: Milestones and challenges in expanding nursing science. *Research in Nursing & Health, 2011, 34*, 169–170.

Chikotas, N.E., Parks, C.I., Olszewski, K. (2012). A comprehensive review of the healthy people 2020 occupational safety and health objectives: Part 2. Tools for the occupational health nurse in goal attainment. *Workplace Health & Safety 60*(2), 78-89.

Vulnerable Population Porfolio. (2010). A New Way to Talk About THE SOCIAL DETERMINANTS OF HEALTH. *Robert Wood Johnson Foundation.* 1-35
http://www.rwjf.org/content/dam/farm/reports/reports/2010/rwjf63023

Parks, C.I., Chikotas, N.E., & Olszewski, K. (2012). A comprehensive review of the healthy people 2020 occupational safety and health objectives: Part 1. Tools for the occupational health nurse in goal attainment. *Workplace Health & Safety 60*(1), 33-42.

Week 2 (09/08/15)

Brownson, R. C., Fielding, J. E., & Maylahn, C. M. (2009). Evidence-based public health: a fundamental concept for public health practice. *Annual review of public health*, *30*, 175-201.

Paneth-Pollak, R., Schillinger, J.A., Borrelli, J.M., Handel, S., Pathela, P, & Blank, S. (2010). Using STD electronic medical record data to drive public health program decisions in new york city. *American Journal of Public Health, 100*(4), 586-590.

McKenzie, J. F., Neiger, B. L., & Thackeray, R. (2012). Planning, Implementing, and Evaluation Health Promotion Programs: A Primer. (6th ed.) San Francisco: Benjamin Cummings, Pearson. **Chapter 2**

Zammit, R. (2014). OA26 How inclusive partnership working influences local policy and practice: the case of the end of life partnership. BMJ Support Palliative Care, 5(Suppl 1), A8.

Week 3 (09/25/15)

Bryan, R.L., Kreuter, M.W., & Brownson, R.C. (2009). Integrating adult learning principles into training for public health practice. Health Promotion Practice, 10(4), 557-563.

Frieden, T. R. (2010). A framework for public health action: the health impact pyramid. *American journal of public health*, *100*(4), 590-595.

Miller, B., McCardle, P. & Hernandez, R. (2010). Advances and remaining challenges in adult literacy research. *Journal of Learning Disabilities 43*(2), 101-107.

Netto, G., Bhopal, R., Lederle, N., Khatoon, J., & Jackson, A. (2010). How can health promotion interventions be adapted for minority ethnic communities? Five principles for guiding the development of behavioural interventions. *Health Promotion International*, *25*(2), 248-257.

McKenzie, J. F., Neiger, B. L., & Thackeray, R. (2012). Planning, Implementing, and Evaluation Health Promotion Programs: A Primer. (6th ed.) San Francisco: Benjamin Cummings, Pearson. **Chapter 3 & 7**

Week 4 (09/29/15)

Depke, J.L. & Onitilo, A.A. (2011). Coalition building and the intervention wheel to address breast cancer screening in Hmong women. *Clinical Medicine & Research, 9*(1), 1-6.

McKay, M.L. & Hewlett, P.O. (2009). Grassroots coalition building: Lessons from the field. *Journal of Professional Nursing, 25*(6), 352-357.

Ochoa, E.R. & Nash, C. (2009). Community engagement and its impact on child health disparities: Building blocks, examples, and resources. Pediatrics 124(Suppl. 3), S237-S245.

Mason, D., Leavitt, J.K., & Chaffee, M.W. (2011). Policy and Politics in Nursing and Health Care. (6th ed.) St. Louis, Missouri: Saunders Elsevier. (**Read Chapters 85, 86 and 87**)

McKenzie, J. F., Neiger, B. L., & Thackeray, R. (2012). Planning, Implementing, and Evaluation Health Promotion Programs: A Primer. (6th ed.) San Francisco: Benjamin Cummings, Pearson. **Chapter 9**

Week 5 (10/06/15)

Buchholz, S. W., Wilbur, J. & Ingram, D. (2013). Physical activity text messaging interventions in adults: A systematic review. *Worldviews on Evidence-Based Nursing, 10*(3), 163-173.

Brown, J. (2013). A review of the evidence on technology-based interventions for the treatment of tobacco dependence in college health. *Worldviews on Evidence-Based Nursing, 10*(3), 150-162.

Muessig, K.E., Pike, E.C., Fowler, B., LeGrand, S., Parsons, J.T., Bull, S.S., Wilson, P.A., Wohl, D.A., and Hightow-Weidman, L.B. (2013). Putting prevention in their pockets: Developing mobile phone-based HIV interventions for black men who have sex with men. *AIDS Patient Care and STDs, 27*(4), 211-222.

Whittaker, R., Borland, R., Bullen, C., Lin, R.B., McRobbie, H., & Rodgers, A. (2009). Mobile phone-based interventions for smoking cessation. *Cochrane of Systematic Reviews, 4*, 1-24.

McKenzie, J. F., Neiger, B. L., & Thackeray, R. (2012). Planning, Implementing, and Evaluation Health Promotion Programs: A Primer. (6th ed.) San Francisco: Benjamin Cummings, Pearson. **Chapter 8 & 12**

Week 6 (10/13/15)

None

Week 7 (10/20/15)

Mason, D., Leavitt, J.K., & Chaffee, M.W (2011). Policy and Politics in Nursing and Health Care. (6th ed.) St. Louis, Missouri: Saunders Elsevier. (**Read Chapters 7 (pp. 49-64) and one of the Taking Actions (Chapters 93-100)**)

Week 8 (10/27/15)

Mason, D., Leavitt, J.K., & Chaffee, M.W. (2011). Policy and Politics in Nursing and Health Care. (6th ed.) St. Louis, Missouri: Saunders Elsevier. (**Read Chapters 10, 39, 40, 41, 42 and 92**)

Week 9 (11/03/15)

Mason, D., Leavitt, J.K., & Chaffee, M.W. (2011). Policy and Politics in Nursing and Health Care. (6th ed.) St. Louis, Missouri: Saunders Elsevier. (**Read Chapters 7, 8, 9 and 10**)

Week 10 (11/10/15)

None

Week 11 (11/10/15)

None

Week 12 (11/24/15)

None

Weeks 13-14 (12/08/15 and 12/08/15)

Centers for Disease Control and Prevention. (2010). *Community Health Assessment and Group Evaluation (CHANGE) Action Guide: Building a Foundation of Knowledge to Prioritize Community Needs*. Atlanta: U.S. Department of Health and Human Services. http://www.cdc.gov/nccdphp/dch/programs/healthycommunitiesprogram/tools/change/pdf/changeact ionguide.pdf

Riley, W.J., Moran, J.W., Corso, L.C., Beitsch, L.M., Bialek, R., & Cofsky, A. (2010). Defining quality improvement in public health. *Journal of Public Health Management & Practice, 16(*1), 5–7.

McKenzie, J. F., Neiger, B. L., & Thackeray, R. (2012). Planning, Implementing, and Evaluation Health Promotion Programs: A Primer. (6th ed.) San Francisco: Benjamin Cummings, Pearson. **Chapter 13, 14 & 15**

Required Text

McKenzie, J. F., Neiger, B. L., & Thackeray, R. (2012). Planning, Implementing, and Evaluation Health Promotion Programs: A Primer. (6th ed.) San Francisco: Benjamin Cummings, Pearson. ISBN: 9780321788504.

Required Additional Readings:

ACHNE web site. http://www.achne.org/i4a/pages/index.cfm?pageid=1

American Psychological Association (APA). (2009). *Publication manual.* (6th ed.). Washington, DC: APA

Healthy People 2020. http://www.healthypeople.gov/hp2020/Objectives/TopicAreas.aspx

Mason, D., Leavitt, J.K., & Chaffee, M.W. (2011). *Policy and Politics in Nursing and Health Care*. (6th ed.) St. Louis, Missouri: Saunders Elsevier. ISBN: 9781437714166.

Quad Council PHN Competencies. (2011). http://www.achne.org/files/Quad%20Council/QuadCouncilCompetenciesforPublicHealthNurses.pdf

The future of nursing: Leading change, advancing health. (2010). http://www.iom.edu/~/media/Files/Report%20Files/2010/The-Future-of-Nursing/Future%20of%20Nursing%202010%20Recommendations.pdf.

Method of Evaluation

1. Practicum Experience: (167 hours total) Pass/Fail. A grade of Pass is required in order to receive a grade in Nurs 772. Use TYPHON to submit weekly clinical log according to required template for agency and non- agency learning experiences. Submit weekly log in a complete and timely fashion. Document completed 167 clinical hours. Non-agency clinical hours require prior approval by Seminar Instructor and are not to exceed 25 hours of the 167 total.

2. Aggregate Health Promotion Intervention Assignment (20%): Due date 10/06

For this assignment, you will describe two (2) realistic health interventions you would be able to implement, which addresses a person/people with a specific health issue identified from your aggregate. The interventions should be directed towards people with a specific illness, a detailed description on how the health care system/services (i.e. access to care, health insurance) support the affected people. To prepare for this assignment, you will need to find at least 5 articles from a peer-reviewed journal to use for this assignment. These articles should describe current health interventions about your selected aggregate. These sources can help you to get a better understanding of your aggregate, identify shortcomings of current health interventions, and learn about effective intervention strategies for your aggregate. For this paper, you will need to compare and contrast at least 2 existing interventions identified from the literature, and then explain why you chose these two interventions and how they are appropriate for your aggregate (e.g., people with HIV), and how you would adapt these two interventions for your aggregate.

The aggregate paper only requires for you to discuss 2 interventions, NOT 4. The 2 interventions should be evidenced-based from the literature and should be tailored to your specific aggregate. Detail should be provided explaining how it was tailored and the specifics of the intervention itself.

Submit **no more than 6 pages,** typed, double-spaced using APA style. References should be evidenced based published articles, not older than 5 years old. Use heading in your paper.

Grading

- Identifies and describes the aggregate (2%)
- Clearly explains and describes at least three (3) needs of the aggregate (e.g., more programs on prevention and cessation of cigarette smoking) (3%)
- Describes and identifies at least three (3) risk factors of the aggregate (e.g., if aggregate is people with HIV than a possible risk factor would be using IV drugs) (3%)
- Identifies two (2) health interventions for the aggregate (2%)
- Clearly describes how the intervention would be adapted and provides the rationale for adapting such interventions for the aggregate (5%)
- Grammar, spelling, punctuation, organization, clarity (i.e., ideas are concrete and comprehensive) and APA format (5%)

If the assignment is late, 5 point will be deducted the first day it is late and 1 point thereafter each day the assignment is overdue, starting the day after the original due date.

3. Partnership assignment-Total 20%: Due date 10/27
Submit **no more than 6 pages,** typed, double-spaced using APA style. References should be evidenced based published articles, not older than 5 years old. Use heading in your paper.

Grading:
- Identify at least 5 partners you would work with to improve the health status of your aggregate. Include address and description of the partner (e.g., facility/community based organization) and overall services they provide (2.5%)
- Explain how these partners are important and appropriate to work with, for your aggregate. What is the aim of collaborating with this partner? (5%)
- What programs, specific to your aggregate, currently exist at these partnerships you would collaborate with? Explain the programs in detail (e.g., age group it services, description of the program itself) (5%)
- Describe and explain what would be your role as a partner and what your contribution would be? (5%)
- Grammar, spelling, punctuation, organization, clarity (i.e., ideas are concrete and comprehensive) and APA format (2.5%)

If the assignment is late, 5 point will be deducted the first day it is late and 1 point thereafter each day the assignment is overdue, starting the day after the original due date.

4. Program Development & Evaluation Assignment (20%): Due date 12/01
Based on the two (2) interventions identified in the "Aggregate Health Promotion Intervention Assignment" directed towards your aggregate (i.e., people with a specific illness) use both interventions and develop one (1) program that can be utilized in a specific setting (e.g., schools, community mental health organizations, academic department).
Submit **no more than 5 pages.** Five (5) pages maximum for the program. Assignment must be typed, double-spaced using APA style. References should be evidenced based published articles, not older than 5 years old. Use heading in your paper.

Grading:
1. Identify the two (2) interventions for the aggregate (1%)
2. Write your own vision statement, mission statement, and philosophy statement of the program you develop (3%)
3. Identify in detail at least three (3) goals of the program you develop (2%)
4. Identify in detail at least three (3) objectives of the program you develop (2%)
5. Identify staff needed for the program. Provide rationale of each staff member and role for each. (4%)
6. Explain methods you would use to evaluate your program (4%)
   Grammar, spelling, punctuation, organization, clarity (i.e., ideas are concrete and comprehensive) and APA format (4%)

If the assignment is late, 5 point will be deducted the first day it is late and 1 point thereafter each day the assignment is overdue, starting the day after the original due date.

5. Program Development and Evaluation Presentation (15%): Due date 12/15
- **PowerPoint submitted electronically to your individual Blackboard folder by 12/13**
  Limit presentation to maximum of 7 slides, excluding title slide which includes your name and credentials and references. Use APA format to cite sources throughout the presentation.
- **Presentation of key findings 12/16–last day of class**
  Presentation of highlights of Program Development and Evaluation Assignment - frame your comments from the perspective of delivering your program and evaluation key findings to Administrators of the agency. Assume that the Administrators have reviewed your PowerPoint. Presentation is between 6-7 minutes maximum, includes Q & A.

6. Scholarly contributions during lecture and seminar discussions (5%)
Complete assigned readings/resources; participate in discussions, integrating readings/resources and clinical experiences; offer constructive support to fellow students and class/seminar dynamics; and analyze and interpret topics under consideration and share learning.

7. Blackboard assignment (20%): Due dates 9/25, 10/13, 11/10 and 11/24
On-line Blackboard assignments will be available the Monday of the seminar and will be due by Sunday of that week. For example, on-line assignment of 10/13 will be available to you on 10/12 and will be due on 10/18.

a. Use the template provided to complete the Logistic assignment. Post onto Blackboard into the folder allocated for the assignment (Logistic assignment 5%). Please see rubric for grading. If the posting is submitted after the due date and time, you will earn a zero (0) for the assignment. You need to post your responses by 11:59pm on the due date of the assignment. If you need help with Blackboard, please call Student HelpDesk at 212.650.3624
b. Bb assignment (5%)
c. Bb assignment (5%)
d. Bb assignment (5%)

Rubric for Logic Model Blackboard Assignment

	Yes	No	N/A	Total Points
Description of the problem and subproblem is understandable, clear and concise.				1
Activities are clear and appropriate to address the problem and subproblem(s) identified.				1
Output measures are clear are appropriate and related to the activities.				2
Short-term and long-term measures are understandable, appropriate for the output measures and addresses the problem and subproblem.				1

Clinical Attire:
Students are expected to dress appropriately (professionally and according to the agency's standards) during clinical. Acceptable attire does NOT include jeans. Remember you are representing Hunter-Bellevue School of Nursing at the clinical site.

Attendance Policy:
Students are expected to attend class weekly. If they miss a class due to illness or unexpected circumstances, it is their responsibility to obtain information regarding missed content.

Communication:
Any changes in the class schedule, additional information about assignments, etc., will be posted on Blackboard. In general, announcement will be posted on Blackboard to alert students as well as sent via e-mail. Please check Blackboard and Hunter e-mail regularly.

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Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. The full policy can be accessed at the Hunter College Senate website: http://www.hunter.cuny.edu/senate[1].

STUDENT SERVICES, OFFICE OF AccessABILITY:

In compliance with the Americans with Disabilities Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring education parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (emotional, medical, physical and/or learning) consult the Office of AccessABILITY located in Room E1124 [on the 68th Street campus] to secure necessary academic accommodations. For further information and assistance please call 212-772-4857 (TTY 212-650-3230).

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The policy can be accessed at: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-academic-integrity

Revised 09/09/15 ja

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 73700: Supervised Fieldwork in Public Health
3 Credits
Fall 2015

Time and location	Mondays 8:00pm-9:45pm // Silberman, room 201 See **Schedule** below for details.	
Instructors	**Contact info**	**Office hours and location**
Janice Chisholm (HPM)	jc2898@columbia.edu	By appointment
Jennifer Brite (EPI/BIOS)	jenbrite@gmail.com	By appointment
Daliah Heller (COMHE)	daliah.heller@sph.cuny.edu	By appointment 55 West 125th St, rm 808
Brian Pavilonis (EOHS)	bp305@hunter.cuny.edu	By appointment Silberman, rm 721
Arlene Spark (NUTR)	aspark@hunter.cuny.edu	By appointment Silberman, rm 609
Course website	https://bbhosted.cuny.edu	
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.	
Course description	Students carry out 180 hours of supervised field work that is intended to bridge academic preparation and public health practice. Knowledge and skills from the core MPH and specialization courses are applied in a public health agency, community organization or other setting relevant to the student's academic background, specialization and career expectations. This is accomplished under the supervision and guidance of an experienced preceptor. Field-	

	based hours are implemented with classroom and individual meetings along with online communication. Aside from deliverables required by the preceptor, the student develops a reflection paper, a self-evaluation and a capstone proposal.
Course prerequisites	Completion of 18 credits toward the master's degree, including at least 3 required core courses (biostatistics, epidemiology, and the course most relevant to your specialization) and at least 2 courses in student's specialization.
Course format	The course is provided in a hybrid format – didactic sessions are provided online, including confirmatory participation quizzes, and face-to-face sessions are held for group meetings with faculty advisors and peers. Please see Schedule below for details.
Required reading and resources	NA
Suggested reading and resources	**BOOK** • Brownson RC, Baker EA, Leet TL, Gillespie KN, True WR. Evidence-Based Public Health, 2nd edition, Oxford University Press, 2011. **ARTICLES** **(Sessions 1, 2)** • Baker, E.L., Jr. et al, *The Public Health Infrastructure and Our Nation's Health. Annual Review of Public Health*, 2005. **26**:p. 303-318. • Mays, Glen P. et al, *Public Health Delivery Systems-Evidence, Uncertainty, and Emerging Research Needs*. American Journal of Preventive Medicine, 2009. **36**(3), p. 256-265. • Mays, Glen P, D. Scutchfield, M.W. Bhandari, and S.A. Smith, *Understanding the Organization of Public Health Delivery Systems: An Empirical Typology*. The Milbank Quarterly, March 2010. **88**(1): p. 81-111. **(Sessions 3-5)** • Callahan, D. and B. Jennings, *Ethics and Public Health: Forging a strong relationship.* American Journal of Public health, 2002. **92**(2): p. 169-176. • Brownson, R.C., J.E. Fielding, and C.M. Maylahn, *Evidence-Based Public Health: A Fundamental Concept for Public Health Practice.* Annual Review of Public Health, 2009. **30**(1): p. 175-201.

	• Rychetnik, L., et al., *Criteria for evaluating evidence on public health interventions.* Journal of Epidemiology and Community Health, 2002. **56**(2): p. 119-127. **RESOURCES** **(Sessions 1-3, 6)** • **Searching the literature and managing references** http://libguides.library.hunter.cuny.edu/ph755/databases • **Writing a literature review** http://www.sportsci.org/jour/9901/wghreview.html **(Sessions 7, 8)** • **Writing a research paper** http://intqhc.oxfordjournals.org/content/16/3/191.full/ http://intqhc.oxfordjournals.org/content/16/3/191/T1.expansion.html http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html • **Resume tips** http://www.sph.unc.edu/student_affairs/revamp_your_resume_and_cv_3312_4585.html • **Interviewing tips** http://www.boston.com/jobs/bighelp2008/fall/common_interview_mistakes/?s_campaign=8315

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Demonstrate (e.g. through the portfolio) the application of assessment, assurance and/or policy development during the fieldwork experience.	• Identify and assemble in the e-portfolio the product(s) of fieldwork project that exemplify the application of core public health functions in your work
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Demonstrate through self-reflection activities the application of one or more core public health values or techniques through the fieldwork experience	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Adhere to ethical and social justice principles and standards	• Apply ethical principles to fieldwork placement, (e.g. human subjects' protection principles to the data collection). • Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards	• Establish an approved protocol through CUNY IRB for human subjects' protection in your fieldwork project • Complete and submit the Student's Evaluation of Fieldwork Project Form
Interpret and analyze public health literature and apply evidence-based research	• Explore and become familiar with the public health literature databases and resources for organizing citations and sources	• Submit a rapid literature scan on your fieldwork topic

		• Submit a working bibliography on your fieldwork topic • Submit a literature review on your Capstone research question
Apply basic statistical and informatics techniques	• Review and identify appropriate quantitative methods and tools for measuring public health data	• OPTIONAL (Quantitative Studies Only). In your Capstone Proposal, describe the method(s) you've selected for measuring your data from the fieldwork project
Communicate public health information through oral, written, digital and visual presentation	• Prepare written and oral progress and evaluation reports (e.g. the fieldwork project), using appropriate professional formats.	• Submit via electronic forms two progress reports on the fieldwork placement project • Complete and submit the Student's Evaluation of Fieldwork Project Form
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Discuss the relationship between social, behavioral, biomedical, and environmental elements and health outcomes	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Design and evaluate interventions to prevent or control public health problems	• Develop and assess policies and activities that are responsive to public health problems	•

Collect, analyze and interpret public health data	• Apply data collection, analysis, and interpretation methods to public health data	• OPTIONAL (Quantitative Studies Only). In your Capstone Proposal, describe the method(s) you've selected for measuring your data from the fieldwork project
Engage and collaborate with diverse groups	• Identify different stakeholders and evaluate their roles on the fieldwork project.	• Complete and submit the Student's Evaluation of Fieldwork Project Form
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Discuss the legal aspects of the US public health system and its inter-sectoral relationships with other public systems.	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project	• Complete and submit a Gantt chart describing the timeline for the fieldwork project • Design and submit a logic model describing the process for the research conducted via the fieldwork project
Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Discuss how the agencies you worked with during your fieldwork experience deliver health-related services to the populations they serve.	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice

Course Assessments

The Supervised Fieldwork course is designed to guide students through the development, implementation, and completion of a research project on some aspect of public health practice at an approved placement site. Course assignments reflect the progressive activities involved in conducting the project, including design, planning and management, and implementation. This course process is intended to support the student's progress in the fieldwork project and to generate the elements of a resulting Capstone proposal or template paper for the student's culminating experience in the degree program. During the fieldwork period, students are expected to complete and submit two progress reports, and a final "reflections" paper on the experience. Both students and preceptors are required to complete evaluations of the fieldwork project upon its completion.

Grading

Evaluation criteria

Assignments and their relative weight toward your final grade in the course are listed below. The evaluation rubric which will be used to establish the grade for each assignment is available on the course Blackboard website under the section entitled My Assignments, along with instructions for that assignment. Items prefaced with an asterisk (*) will not have an evaluation rubric, and will be graded simply as complete (full points) or missing/incomplete (no points).

The relative weight of each course component is as follows:

Assessment	Weight
Rapid literature scan	10%
Working bibliography	5%
*IRB determination	5%
*Progress report #1	5%
Gantt chart	5%
Logic model	5%
*Progress report #2	5%
Literature review	15%
"Reflections" paper on fieldwork project	15%
Capstone proposal	20%
Class participation	10%
*Student Evaluation of Fieldwork Project Form	%
*Preceptor Evaluation of Fieldwork Project Form	%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

The final course grade will be determined using the performance assessment described above, and resulting in a Pass (70% or higher) or a Fail (less than 70%) grade.

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

While the program discourages students from taking Incompletes, under some circumstances, an Incomplete may be the only option for completing the Fieldwork Project.

A request for an Incomplete must be approved by the Faculty Advisor, and the incomplete grade must be resolved within the next two semesters.

Students with an Incomplete in this course, Fieldwork (PH 73700), are not eligible for enrollment into the Capstone course (PH 73800) until the Incomplete is resolved.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Because this is a hybrid course, students are expected to participate both online and in face-to-face meetings in class. Online participation is limited to two didactic sessions, and will be assessed with mini-quizzes to be completed at the end of each module in the session. Face-to-face participation will be assessed by faculty-administered attendance at the six class meetings.

Late/incomplete submission of assignments

Late assignments will not be accepted except in extenuating circumstances, with written approval by the student's faculty advisor. Incomplete assignments will be graded as such, unless the student is granted the opportunity to submit a rewrite by the faculty advisor, with written approval.

Make-ups, rewrites, and extra credit

Make-ups and extra credit assignments are not available for this course. In extenuating circumstances, the faculty advisor may allow a rewrite (or resubmission) of an Incomplete assignment, and must agree to this arrangement with written approval.

Expectations of students

Students are expected to submit Assignments on time, to participate respectfully in class and on the course Blackboard website, and to communicate with their Faculty Advisor on progress and problems related to the Fieldwork Project, as soon as issues arise.

Expectations for the instructor

Faculty Advisors will grade Assignments and post results within seven days of submission. Faculty Advisors will respond to all emails from students within 72 hours of receipt, and will arrange face-to-face meetings with students as requested, and with Preceptors, as necessary.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

This course schedule is subject to change.

For important dates, please refer to the current academic calendar.

Session # Mode Date	Topic	Assignment (Please submit all Assignments to your Faculty Advisor via email and via the Assignments section on the course Blackboard site.)
Session 1. **Face-to-face** August 31	Welcome and overview, Fieldwork connection to Capstone • Searching the literature: Initial Lit Scan • Developing a research question • IRB preparation and submission	By 8/31 • A fieldwork contract (Please bring your contract to class)
Session 2. **Face-to-face** September 10	Library session • Search tools • Reference management tools	**Meet in C Level at Silberman Room TBD**
Session 3. **Face-to-face** October 5	Meet in track-specific groups in class • Discuss research question and literature review development	By 10/4 • An IRB determination form (Please bring your completed form to class) • A brief literature scan • First midterm fieldwork status assessment survey

Session # Mode Date	Topic	Assignment (Please submit all Assignments to your Faculty Advisor via email and via the Assignments section on the course Blackboard site.)
Session 4. **Online** October 19 – October 25	• Project Management using Gantt Charts • Logic Models • Charts, Graphs and Figures for Projects	
Session 5. **Face-to-face** October 26	Meet in mixed (non-track-specific) groups in class • Discuss project management planning, processes, and implementation	By 10/25 • A project plan using a Gantt chart or similar timeline model • Project logic model (Please bring both documents to class)
Session 6. **Online** November 9 – November 15	Complete two out of three sections, most relevant to your Fieldwork Project - 1. Complete one of a) Quantitative Analysis – planning and preparation: data analysis and mini stats review b) Qualitative Studies – planning and analysis *2.* Capstone paper – planning and development	By 11/9 • Second midterm fieldwork status assessment survey • Preliminary working bibliography • Literature review
Session 7. **Face-to-face** November 16	Meet in track-specific groups in class • Peer review and discuss each other's Capstone paper proposals	By 11/15 • First draft of Capstone proposal (Please bring your first draft to class)

Session # Mode Date	**Topic**	**Assignment** **(Please submit all Assignments to your Faculty Advisor <u>via email and via the Assignments section on the course Blackboard site</u>.)**
Session 8. **Face-to-face** December 14	All-class meeting to review Fieldwork to Capstone requirements • Track-specific group meetings to finalize Fieldwork to Capstone processes	By 12/13 • A completed **Student's Evaluation of Fieldwork Experience Form** • A completed **Field Placement Supervisor's Evaluation Form (emailed from Placement Supervisor to Fieldwork faculty)** • A 'Reflections' document on Fieldwork for Student Portfolio • Capstone Proposal • Working bibliography
Optional. **Individual consultations** December 15-21	Student Faculty Consultations	**Note: Students should verify that all Assignments have been delivered or scheduled for delivery with Fieldwork faculty.**

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Lehman College
PHE 700: History and Philosophy of Public Health
3 Credits
Fall 2015

Time and location	Mondays, 6-8:40pm Lehman College, location TBA
Instructor	Emma K. Tsui, PhD, MPH emma.tsui@lehman.cuny.edu (preferred mode of communication) 347-577-4038 Gillet Hall, Room 422D
Office hours	Mondays 4:30-5:30pm and Thursdays 3:30-5:30pm (walk-in) and other times by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available. Lehman's Academic Center for Excellence (ACE) provides appointment-based and drop-in tutoring and general writing and academic skills workshops. To obtain more information about the ACE, please visit http://www.lehman.edu/issp or call the ACE at 718-960-8175.
Course description	Examination of historical development and philosophical concepts underlying the practice of public health; social, political, and institutional forces shaping public health policy and the commitment to monitor, protect, and promote the public's health; emphasis on the relationship between public health knowledge, values, and actions.
Course prerequisites	N/A
Course format	In-person lecture and discussion-based sessions
Required reading and resources	Hives of Sickness: Public Health and Epidemics in New York City. Edited by David Rosner (New Brunswick, N.J.: Rutgers University Press, 1995). Price: $30.29, Amazon Available on reserve at the Leonard Lief Library Institute of Medicine. The Future of the Public's Health in the 21st Century. Free download at: http://www.iom.edu/Reports/2002/The-Future-of-the-Publics-Health-in-the-21st-Century.aspx Other articles as assigned under "Schedule".
Suggested reading and resources	See listing under "Schedule"

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Communicate public health information through oral, written, digital and visual presentation	• Summarize a peer-reviewed journal article • Synthesize peer-reviewed journal articles on a specific topic • Trace and discuss the historical development, themes and ongoing controversies in the field of public health	All assessment methods
Collect, analyze and interpret public health data	• Use electronic databases to gather public health information	Journal article summaries, annotated bibliography, and synthesis paper
Interpret and analyze public health literature and apply evidence-based research	• Summarize a peer-reviewed journal article • Synthesize peer-reviewed journal articles on a specific topic	Journal article summaries, annotated bibliography, and synthesis paper

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*

Analyze critical health inequalities confronting urban populations by social and economic determinants such as race, ethnicity, income and neighborhood	• Trace and discuss the historical development, themes and ongoing controversies in the field of public health	Participation in class discussions
Identify aspects of public health ethics and values of social justice that affect public health practice and decision-making	• Define, understand and discuss the philosophical orientation of public health • Trace and discuss the historical development, themes and ongoing controversies in the field of public health	Participation in class discussions, presentation on a historical figure
Synthesize theories, methods and practice of public health to address income inequities within communities	• Trace and discuss the historical development, themes and ongoing controversies in the field of public health	Participation in class discussions, synthesis paper

Course Assessments
The following assignments are meant to give you a chance to practice and develop expertise in skills that are fundamental to the forms of public health research and writing that you will be doing throughout the MPH program. These include: 1) understanding and summarizing the key points of public health journal articles, 2) searching the public health literature to find articles on a given topic, and 3) synthesizing what you've learned from those articles. These are critical skills for succeeding in the program and as a public health professional. We have designed these assignments to be clear, manageable, and short. This means we expect that all of your work will be thoughtful and of the highest quality.

Journal Article Summaries (2)
You will practice reading an assigned journal article, summarizing and writing up its key points, using the guidelines and practices discussed in class. You will receive feedback from your first journal article summary and you are expected to put this feedback to use when writing your second journal article summary.

Annotated Bibliography
For this assignment, you will conduct a search of the literature on one of three topics. You will receive guidance from our health sciences librarian on how to effectively search the scientific literature. Using the articles you find that are most closely related to your topic, you will construct an annotated bibliography of at least 6 articles. This is an extremely small bibliography and the goal is to choose high-quality, well-targeted articles that can be synthesized into a short paper on your chosen topic.

Synthesis Paper
In a paper of 400-800 words, **synthesize** what you learned about your topic. Doing well on this assignment requires that you integrate findings from all of your sources and that you do not merely report findings of different studies sequentially. If you find that any articles from your bibliography cannot be synthesized comfortably into your paper, then you can replace them with more suitable articles.

Presentation on a PH historical figure/topic
You will give a presentation of 5-10 minutes on a public health historical figure/topic, using the rubric presented in class for guidance.

Grading
Evaluation criteria
Grading rubrics will be provided via the course website for course assignments.

The relative weight of each course component is as follows:

Assessment	Weight
Participation in class discussions/attendance	15%
Journal Article Summaries (2)	25%

Annotated Bibliography	25%
Synthesis Paper	25%
Presentation on a PH historical figure	10%
	100%

The grading system for the course follows guidance given by the Lehman College Department of Health Sciences:

Letter Grade	Points
A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
F	< 70%

Withdrawal

The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete

The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full

semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

All members of the class are expected to actively participate in class lectures, activities, and discussions, and to complete assigned reading **and other assigned activities** prior to class. Attendance means more than just showing up; it means doing the reading and, more importantly, actively engaging with the ideas and issues brought up in the reading and in class. Your comments, questions and opinions are essential ingredients for making this course a challenging and rewarding experience for your classmates as well as for yourself, and it is expected that you come prepared to make this contribution. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible. Points may be deducted for absences, tardiness, or leaving class early.

Late/incomplete submission of assignments

I expect that all assignments that are not to be completed in class will be submitted to me via email or Blackboard by midnight on the due date (usually the night before a class session). Assignments submitted after the due date will have half a letter grade deducted for each day that the assignment is late, except in cases of significant medical issues or other serious situations.

Make-ups, rewrites, and extra credit

Make-up assignments will not be allowed in this course, nor will rewrites. Extra credit assignments may be made available to students as opportunities during the semester present themselves.

Expectations of students

I expect the classroom to serve as a space of respect and collaborative learning and that the course assignments will help you to develop specific skills. To that end, I expect that:

- you will arrive on time and stay for the entire class
- you will not use cell phones during class, except during breaks
- you will visit our Blackboard site frequently, as that will be our primary way of communicating with one another outside of class. Class announcements and supplemental materials will be posted there frequently. Course announcements will also be sent out using the Lehman e-mail system. If you have any questions about your Lehman email address or your password, or if you have any problems accessing the site, please call the computer helpdesk at 718-960-1111.
- your writing for assignments will be of high quality, presented in a readable and consistent manner: double-spaced, typewritten, with one-inch margins all around, and **proofread**.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during in-class discussions
- Respond to student email within 24 hours Monday through Friday.
- Grading and feedback on assignments within 2 weeks of the due date.

Accessibility

Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, at 718-960-8441.

Academic integrity

The faculty and administration of Lehman College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Lehman College procedure for implementing the policy can be found in the Graduate Bulletin.

Course Schedule

Please note that the schedule and assignments listed below are subject to change. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. Opportunities for group/individual work may be scheduled during some sessions. All readings that are not part of the required text will be available via Blackboard. For important dates (e.g., course drop and withdrawal), please refer to Lehman's graduate academic calendar: http://www.lehman.edu/registrar/calendars.php.

	Date	**Topic**	**Readings and Assignments** (Required unless labeled "recommended")
1	8/31	Introduction to the course	• P.H.101: Chap. 1 Public Health: The Population Health Approach • 10 Public Health Achievements, United States, 1900-1999 • 10 Public Health Achievements, United States, 2000-2010 *Recommended* • Glass, et al. "Causal Inference in Public Health," Annu. Rev. Public Health (2013). 34:61-75.
	9/7	**No class (Labor Day)**	

2	9/10	Health equity & inequity	• IOM Report: Chap. 1 pp. 19-45 • Phelan, J. Link, B, and Tehranifar, P. "Social Conditions as Fundamental Causes of Health Inequalities: Theory, Evidence, & Policy Implications," Journal of Health and Social Behavior (2010): 41S S28-S40. *Recommended* • Raphael, Dennis. "Public policies & the problematic USA population health profile". Health Policy. 84 (2007): 101-111. • Marmot, M.G. "Inequalities in Health," New England Journal of Medicine (12 July 2001): 134-136.
	9/14	**No class**	
3	9/21	Changing patterns of health and illness (*1918 Influenza* video)	• Rothstein, William G. "Trends in Mortality in the Twentieth Century," reprinted in Lee and Estes, The Nation's Health, 7th ed. pp. 11-30. • "Achievements in Public Health, 1900-1999: Control of Infectious Diseases," Lee and Estes, The Nation's Health, 7th ed. pp. 31-37. *Recommended* • Schroeder, SA. "We can do better – improving the health of the American people." NEJM. 2007; 35: 1221-8. (Blackboard) **Journal article summary #1 due by midnight on September 20th**
4	9/28	How to search for articles	Meet in Library Lobby **Complete online library assignment**
5	10/5	Location as a social determinant of health I: Urban health then and now	• IOM Report: Chap. 2, pp. 46-95 • Hives of Sickness: Intro pp.1-21: and Condran, "Changing Patterns of Epidemic Disease in New York City", pp. 27-41
	10/12	**No class (Columbus Day)**	
6	10/19	Responding to epidemics (*Typhoid Mary* video)	• Hives: Leavitt, "Be Safe. Be Sure" New York City's Experience with Epidemic Smallpox", pp. 93-114. • Hives: Rogers, "A Disease of Cleanliness:

			Polio in New York City, 1900-1990", pp. 115-130. **Journal article summary #2 due by midnight on October 18th**
7	10/26	Whose view matters? Community perspectives on public health problems	• IOM Report, Chap. 4, pp. 178-211 • Barbara Israel et.al. "Review of Community-based Research: Assessing Partnership Approaches to Improve Public Health", Annual Review of Public Health, 1998, 19(1):173-203.
8	11/2	Race as a social determinant of health: The Case of Tuskegee (*Deadly Deception* film)	• Allan Brandt, "Racism and Research: The Case of the Tuskegee Syphilis Study: The Hastings Center Report, Dec. 1978, 8(6):21-29. • Hives: Kraut, "Plagues and Prejudice: Nativism's Construction of Disease in Nineteenth- and Twentieth-Century New York City", pp. 65-90.
9	11/9	Public health & political activism: The Case of HIV/AIDS	• Hives: Ronald Bayer, "The Dependent Center: The First Decade of the AIDS Epidemic in New York City", pp. 131-150. • Allan Brandt "AIDS in Historical Perspective: Four Lessons from the History of Sexually Transmitted Diseases" American Journal of Public Health, 1988, 78(4): 367-371.
10	11/16	Location as a social determinant of health II: Public health & housing (film *Unnatural Causes: Place Matters)*	• Hives: Blackmar, "Accountability for Public Health: Regulating the Housing Market in Nineteenth-Century New York City, pp. 42-64. **Annotated bibliography due by midnight on November 15th**
11	11/23	The relationship of public health to health care	• IOM Report: Chap. 5, pp. 212-26 • Gostin, Lawrence O. and Madison Powers." What Does Social Justice Require for the Public's Health? Public Health Ethics and Policy Imperatives". Health Affairs. 25(4): 1055-1060. July/August 2006

12	11/30	Public health & corporate power	• Gerald Markowitz and David Rosner,"The Limits of Thresholds: Silica and the Politics of Science 1935-1990" American Journal of Public Health, February 1995, 85(2):253-262. • Read one article from Corporations and Health Watch: http://corporationsandhealth.org/
13	12/7	Public health & globalization	• McMichael AJ, Beaglehole R. "The changing global context of public health." The Lancet. 2000, 356: 495-499. • Leonard L. "Working 'off the record': polio eradication and state immunity in Chad." Critical Public Health. 2011, 21(3): 257-271.
14	12/14	Public health ethics, values and human rights	• Bayer, Ronald; Fairchild, Amy L. "The Genesis of Public Health Ethics", Bioethics, Nov 2004, 18(6):473-492; • Paul Farmer, "Pathologies of Power: Rethinking Health and Human Rights", American Journal of Public Health, 1999, 89(10):1486-96;
15			**Synthesis paper due by midnight on December 18th**

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 807 Practicum Project
3 Credits
Fall 2015

Time and location	This course will not meet.
Instructor	Daliah Heller, PhD MPH daliah.heller@sph.cuny.edu
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	The DPH Practicum Project is a planned, supervised and evaluated experience that allows students to apply the knowledge and skills that they have acquired through learning experiences in a practice setting. The DPH Practicum Project requires 180 practicum hours that can be completed in a range of organizations across New York City or elsewhere. Students must document how the 180 practicum hours are spent. The student must complete a detailed learning plan, a summary report (that includes objectives), a self-evaluation, and a final report.
Course prerequisites	PUBH 800, PUBH 801
Course format	The pedagogical component of this course will be administered online, including all assignments. The student will meet individually with the Course Instructor at least twice during the semester (Practicum Project period).
Required reading and resources	N.a.
Suggested reading and resources	N.a.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify, develop, evaluate and recommend policy and programmatic interventions to improve population health at individual, community, government and country levels based on empirical evidence of social, political, cultural, biological, economic, historical, behavioral, environmental, and global factors in health and disease.	Apply public health knowledge and skills to design, implement monitor, and assess health-related interventions.	• Learning Plan • Progress Report • Final Report
Assess the mechanisms and pathways by which factors influence individual and population health.		
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues.	Demonstrate the application of cross-disciplinary methods, theories, and data in public health practice.	• Final Report
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	Present and discuss public health research and practice in diverse settings and audiences.	• Final Report • Project-related products • Self-reflection paper
Demonstrate leadership skills to facilitate the goals of population health research and practice.		
Design and deliver innovative educational experiences that promote learning about population health in academic and practice-based settings	Apply public health research and practice innovation to a wide array of settings and situations	• Learning Plan
Implement professional and organizational ethical guidelines in population health research and practice.	Thoroughly articulate and address ethical issues in public health research and practice.	• Self-reflection paper

Secure resources to conduct population health research and practice	Identify sources of funding and material support for public health research and practice.	• Self-reflection paper

Course Assessments

Over the course of the semester, the student is required to submit four assessments: a detailed Learning Plan, a Progress Report, a Final Report, and a Self-Evaluation paper. Though not graded, the Project Preceptor must also complete and submit a Student Evaluation Report at the end of the Project.

Grading

Evaluation criteria

Student progress in the Practicum will be measured with the documents submitted over the course of the semester. A rubric is posted with each Assignment on the Blackboard course website, detailing the measures by which it will be assessed.

The relative weight of each course component is as follows:

Assessment	Weight
Learning Plan	15%
Progress Report	10%
Final Report	60%
Preceptor Evaluation	Not graded
Self-Evaluation	15%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

The final course grade will be determined using the performance assessment described above, and resulting in a Pass (70% or higher) or a Fail (less than 70%) grade.

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course.

Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

While the program discourages students from taking Incompletes, under some circumstances, an Incomplete may be the only option for completing the Practicum Project. **A request for an Incomplete must be approved by the Course Instructor, and the incomplete grade must be resolved by the end of the subsequent semester.**

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

No class will be given for this course. Students must submit Assignments to the course Blackboard site by the deadline posted. Students will be required to meet with the Course Instructor at least twice during the semester.

Late/incomplete submission of assignments

Late assignments will not be accepted unless approved by the Course Instructor, and with sufficient documentation describing the reason for lateness.

Make-ups, rewrites, and extra credit

No make-ups, rewrites, or assignments for extra credit will be offered.

Expectations of students

Students are expected to submit Assignments on time, to participate respectfully on the course Blackboard website, and to communicate with the Course Instructor on progress and problems related to the Practicum Project, as soon as issues arise.

Expectations for the instructor

The Course Instructor will grade Assignments and post results within five days of submission. The Course Instructor will respond to all emails from students within 48 hours of receipt, and will arrange face-to-face meetings with students as requested, and with Preceptors, as necessary.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

This course schedule is subject to change.

For important dates in the semester process, please refer to the current academic calendar.

Session	Date	Topic	Assignment
1	August 31	Introduction and review of Practicum Project expectations	ONLINE PARTICIPATION: Students must log on to the Blackboard course, and on the Discussion topic provided, create a new thread introducing themselves and providing a 2-3 sentence description of their Practicum Project. Students must comment on at least one other student's posting. **DUE: By September 6**
2	August 31 thru September 10	Individual meeting with Course Instructor	IN-PERSON MEETING: Schedule and meet with Course Instructor to review Practicum Project work-plan and discuss detailed Learning Plan.
3	September 10	Learning Plan assignment	ASSIGNMENT SUBMISSION: **DUE: By September 14** Prepare a detailed Learning Plan for your Practicum Project, and submit to Blackboard
4	October 5	Progress Report assignment	ASSIGNMENT SUBMISSION: **DUE: By October 14** Prepare a progress report on your Practicum Project work to date, and submit to Blackboard and to your Practicum Sponsor.
5	November 30 thru December 12	Individual meeting with Course Instructor	IN-PERSON MEETING: Schedule and meet with Course Instructor to review Practicum Project progress and discuss plans for Final Report.

6	December 14	Final Report assignment	ASSIGNMENT SUBMISSION: **DUE: By December 14** Submit a comprehensive final report on your Practicum Project, demonstrating how the Project objectives were achieved. Submit via Blackboard, and include any attachments produced for the Project.
7	December 14	Practicum Sponsor evaluation of student	EVALUATION SUBMISSION (not graded): **DUE: By December 18** Practicum Sponsor must email a completed, co-signed evaluation form to Course Instructor. *Student should also upload the completed evaluation form to the Final Report submission on Blackboard.
8	December 14	Self-evaluation	ASSIGNMENT SUBMISSION: **DUE: By December 21** Via Blackboard, submit a final self-evaluation of your work on the Practicum Project.

DOCTOR OF PUBLIC HEALTH (DPH) PROGRAM

Program Manual

August 2015

CUNY SCHOOL OF PUBLIC HEALTH

THE GRADUATE CENTER
CITY UNIVERSITY OF NEW YORK

HUNTER
The City University of New York

Brooklyn College

LEHMAN COLLEGE

The content of this Program Manual Supersedes that of all earlier Program Manuals

Note to Students and Faculty

This manual is designed to give Doctor of Public Health (DPH) Program students the information they need to successfully complete the doctoral degree and faculty the information they need to guide their students. The Graduate Center (GC) Student Handbook describes all relevant policies and is the official document for students at the GC. Students and faculty are encouraged to review that handbook as well as this manual and are expected to be familiar with all relevant GC and DPH policies.

Doctor of Public Health (DPH) Program- Administration

Denis Nash, PhD, MPH
Executive Officer (EO)
212-817-7986 dnash@hunter.cuny.edu

Elizabeth Kelvin, PhD, MPH
Deputy Executive Officer (DEO)
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Sara M. Ingram, MPA
Assistant Program Officer (APO)/Academic Program Coordinator
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Jean Grassman, PhD, MS, CPH
Environmental and Occupational Health (EOH) Track Coordinator(TC)
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Elizabeth Eastwood, PhD, MSW
Health Policy and Management (HPM) Track Coordinator (TC)
718-951-5000 x 2755 Eastwood@brooklyn.cuny.edu

Graduate Center

Security: x 7777

Operator: 212-817-7000

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212-817-7680
bursar@gc.cuny.edu

Financial Aid, Room 7201
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financialaid@gc.cuny.edu

Registrar, Room 7201
212-817-7500
registrar@gc.cuny.edu

Security (ID Office): 212-817-7769

Student Affairs, Room 7301
212-817-7400
studentaffairs@gc.cuny.edu

The Office of International Students
Room 7200
212-817-7490
intstu@gc.cuny.edu

Help Desk /Information Technology
212-817-7300
Helpdesk@gc.cuny.edu

Office of Career Planning and Professional Development, Room 3300.30
212-817-7425
careerplan@gc.cuny.edu

Mina Rees Library
212-817-7077

DPH Program Research Librarian,
Shawn(ta) Smith, Room 2312
212-817-7053
ssmith4@gc.cuny.edu

Ombuds Office, Room: 3311
212-817-7191
MGitterman@gc.cuny.edu

Doctoral Students' Council (DSC)
Robert E. Gilleece Student Center Room: 5495
212-817-2789
dsc@cunydsc.org
http://www.cunydsc.org/

Wellness Center/Psychological Counseling Room 6422
212-817-7020
wellness@gc.cuny.edu

IRB
Kay Powell
kpowell@gc.cuny.edu

Office of Research and Sponsored Programs, Room 8309
Edith Marie Gonzalez, Executive Director
212-817-7530

Adrienne Klein, RCR Officer
212-817-7522

Provost**,** Room 8113
212 817-7200
provost@gc.cuny.edu

David Olan, Room 8113.11
Interim Associate Provost and Dean for Academic Affairs
212-817-7205
dolan@gc.cuny.edu

Students with disabilities should contact the Student Affairs Office.

Students who are Veterans should contact the Registrar.

The GC Mothers' Room is open to all in the GC Community (students, faculty and staff with a current GC ID) to pump breast milk or to nurse. The CUNY Graduate Center Mothers' Room is located in Room 7408. To obtain a key, go to the Student Affairs Office in Room 7301. The GC Mothers' Room was initiated by DPH students!

Students who are parents or expected parents of children by birth or adoption under the age of six may contact the Student Affairs Office regarding the pilot of the Doctoral Student Parental Accommodation Policy.

CUNY School of Public Health

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55 West 125th Street
7th & 8th Floors (Phone TBA)
sph.cuny.edu

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publichealth@gc.cuny.edu
gc.cuny.edu/publichealth

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212-396-7721
cuny.edu/site/sph/hunter-college/about.html

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Brooklyn, NY 11210
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Doctor of Public Health (DPH) Program
Letter from the Executive Officer

Dear Students & Faculty:

I am pleased to present you with this updated DPH Program Manual for students and faculty in which we provide an overview of the DPH program and its requirements.

The CUNY DPH Program aims to:

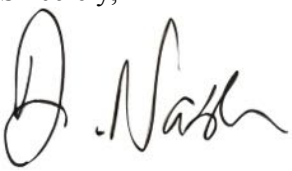
- Prepare public health researchers to rigorously generate and apply scientific evidence to improve the health of populations;
- Provide an interdisciplinary education in which graduates are capable of drawing on health-related theory and knowledge from multiple disciplines;
- Foster multilevel research and intervention - i.e., understanding and addressing public health issues at the individual, household, community, and policy levels; and
- Pay special attention to new and existing linkages between research, practice and policy with relevance to public health.

The mission of CUNY's DPH program is to:

- Prepare students to provide leadership in public health as researchers, managers, policy makers, advocates, and faculty in academic institutions;
- Contribute new knowledge to understanding the multi-level determinants of population health; and
- Assist communities, governments, and organizations to conduct research and interventions that promote health and prevent disease in populations.

The faculty and administration of the DPH Program work hard to ensure that the training and learning experiences of DPH students in our program are both challenging and rewarding. We want and need any help, suggestions, or feedback you can give us in order to realize our vision of a program dedicated to education leading to impactful research and action for public health. We look forward to working with you in this important phase of your training and career in public health!

Sincerely,



Denis Nash, PhD, MPH
Executive Officer, Doctor of Public Health Program, Graduate Center
Professor, Epidemiology and Biostatistics Program, Hunter College
City University of New York

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Overview of the Doctor of Public Health (DPH) Program and the City University of New York (CUNY)

The Doctor of Public Health (DPH) Program

The Doctor of Public Health (DPH) program at the Graduate Center (GC) prepares students to be researchers, teachers, practitioners, and managers who can meet the public health needs of populations, including the population of New York City and around the world. It prepares future faculty members for the growing number of academic training programs in public and community health, and it prepares leaders for the public health workforce.

Courses are taught by doctoral faculty from the Public Health Programs at Brooklyn, Hunter and Lehman Colleges and the Graduate Center. Additional DPH faculty are from other participating CUNY campuses. By drawing on faculty from throughout CUNY, the DPH program offers comprehensive interdisciplinary perspectives on public health and related fields.

The CUNY DPH Program carries out teaching, research and service to create and sustain population health and to promote equitable, efficient, evidence-based solutions to pressing population health problems around the world. Informed by the values of public health, social justice and democracy, the DPH Program seeks to become a platform for collaboration to:

- Examine the causes of and solutions to pressing health problems;
- Engage the public in an ongoing dialogue on public health policy;
- Develop a workforce with the capacity to plan and implement health-promoting programs and policies.

Several themes define the unique approaches that distinguish the CUNY DPH Program. These include a focus on:

- Multi-level analysis, research and intervention;
- Understanding and improving living conditions and health to reduce inequities;
- An interdisciplinary blend of public health and social, behavioral and natural sciences;
- Practice-based research;
- Collaboration with government agencies and public health institutions (e.g. DOHMH, DOE, HHC);
- Diversity -- CUNY programs, students, faculty.

Specialization Tracks

- Community, Society and Health
- Epidemiology
- Environmental and Occupational Health
- Health Policy and Management

Qualified applicants in any track may also apply to an optional concentration in Public Health Nutrition or Maternal, Child, Reproductive and Sexual Health (MCRSH).

The City University of New York (CUNY)

The City University of New York provides high-quality, accessible education for more than 269,000 degree-credit students and 247,000 adult, continuing and professional education students at 24 campuses across New York City.

CUNY School of Public Health

The CUNY School of Public Health is committed to teaching, research and service that creates a healthier New York City and helps promote equitable, efficient and evidence-based solutions to pressing population-based health problems around the world.

Employing the resources of the nation's largest and most diverse urban university, the CUNY School of Public Health seeks to create new models of public health education for the 21st century. The school's consortial campuses (the Graduate Center and Brooklyn, Hunter, and Lehman Colleges) bring together students and faculty from throughout CUNY's academic and professional programs, engaging with practitioners, researchers, activists, community residents and policymakers from many sectors of New York City.

Vision

Promoting health and social justice in New York City and across the globe through innovation and leadership.

Mission

The mission of The CUNY School of Public Health is to provide a collaborative and accessible environment for excellence in education, research, and service in public health, to promote and sustain healthier populations in New York City and around the world, and to shape policy and practice in public health for all.

The Graduate Center (GC), CUNY

The Graduate Center (GC) is the principal doctorate-granting institution of the City University of New York. Offering more than thirty doctoral degrees from Anthropology to Urban Education, and fostering globally significant research in a wide variety of centers and institutes, the GC provides rigorous academic training in the humanities, sciences, and social sciences.

Through its extensive public programs—lectures, conferences, performances, and exhibitions—the Graduate Center contributes to the intellectual and cultural life of New York City and affirms its commitment to the premise that knowledge is a public good.

Brooklyn College, CUNY

Brooklyn College currently serves more than 17,000 students in its undergraduate and graduate program. Founded in the 1930s, Brooklyn College is an integral part of the civic, urban and artistic energy of New York and uses the entire city as a living classroom that broadens our students' understanding of the world around them.

Hunter College, CUNY

Hunter College is the largest college in the City University of New York (CUNY). Founded in 1870, it is also one of the oldest public colleges in the country. More than 23,000 students currently attend Hunter, pursuing undergraduate and graduate degrees in more than 170 areas of study.

Lehman College, CUNY

With more than 60,000 alumni and 12,000 students, Lehman College serves the Bronx and surrounding region as an intellectual, economic, and cultural center. The College is named after Herbert H. Lehman, who was governor of New York State, a U.S. Senator, and an internationalist. His values of dedicated public service continue to guide the College today.

Other CUNY Units

Several other CUNY campuses including the Baruch School of Public Affairs, the Sophie Davis School of Biomedical Education at The City College of New York, and health programs at Queens College and elsewhere contribute faculty to the CUNY DPH program.

Doctor of Public Health (DPH) Program Governance
Summary

The DPH program operates under bylaws established by the program faculty and approved by the CUNY Board of Trustees. The governance structure of the program consists of a single Executive Officer (EO), a single Deputy Executive Officer (DEO), an Assistant Program Officer (APO) and four Track Coordinators (TCs). There are five standing committees which serve to govern the program: the Executive Committee, the Elections Committee, the Faculty Membership Committee, the Curriculum and Examinations Committee, and the Admission and Awards Committee. The DPH program is represented at the Graduate Center by membership in the Graduate Council and the Doctoral Student Council.

The Executive Officer, assisted by the DEO and APO, is responsible for overall administration and oversight of the academic affairs of the program in accordance with the policies established by the standing committees, the program faculty, the Graduate Council of the GC and the CUNY Board of Trustees. The EO reports to the Provost of the Graduate Center and the Dean of the CUNY School of Public Health.

The Track Coordinators are responsible for the day to day operations of the tracks (i.e., academic operations, faculty advising). The TCs report to the EO and DEO.
See the complete DPH Program Bylaws on Blackboard.

The Executive Committee: This is the main policy-making committee for the DPH program. It is chaired by the EO, and has as members: the four TCs, one faculty member with a primary appointment at the GC (unless the EO has one), one faculty member who is not from a consortium college, three DPH students elected by their peers, and additional faculty (where necessary) to ensure representation from all of the SPH consortial campuses not represented by the EO and TCs. The minutes from the meetings of this committee are available to the public.

The Elections Committee: This committee is responsible for coordinating and overseeing all DPH program elections (both committee and TC). It has five members: the EO, one elected faculty from each of the three consortial colleges not represented by the EO, and one student member.

The Faculty Membership Committee: This committee recommends faculty members to the Executive Committee for consideration for appointments to the DPH faculty and formulates procedures for making new faculty appointments. It has seven members: The EO, four faculty members (at least one from each concentration) and two students.

The Curriculum and Examinations Committee: This committee is responsible for reviewing curriculum and recommending changes and for recommending procedures and standards for the conduct of the first and second exams. It has seven members: the EO, one faculty member from each concentration, and two student members.

The Admissions and Awards Committee: This committee recommends to the Executive Committee procedures and standards of admission and awards for the program and the concentrations. It consists of eight members: the EO, the four TCs, a GC based faculty member and two student members.

DPH Participation in CUNY SPH Governance - Summary

The governing body of the CUNY SPH shall be the Faculty and Student Council (FSC). The Faculty and Student Council shall consist of the Dean, the Associate Dean for Academic Affairs, the Campus Directors, all Core Faculty, two affiliated faculty, two staff in the title series HEO or CLT, and five students (one elected from students in each of the consortial campuses, except that two are elected from Hunter College, one from the undergraduate program and one from the masters programs). The FSC meets three times per semester.

Elections for all vacant positions shall normally be held in May prior to the semester in which service begins.
The FSC is responsible for: formulating educational policy and developing standards for admissions, academic performance and degree requirements for students consistent with the by-laws and policies of the CUNY Board of Trustees and other CUNY policies and procedures; reviewing programs and curricula; recommending to the Dean and the CUNY Board of Trustees the granting of undergraduate degrees, graduate degrees and honorary degrees to qualified candidates; considering any other academic matters and making recommendations to the Dean and the CUNY Board of Trustees; establishing or abolishing such standing or temporary committees as it deems necessary and considering reports and recommendations of those committees; and recommending revisions to the SPH Governance Plan.
See the complete CUNY SPH Bylaws and Governance Change May 22nd 2013, both on Blackboard.

DPH Participation in GC Governance - Summary

The Graduate Council is the academic governing body of The Graduate School and University Center, and the Bylaws of Graduate Council set forth its rules of governance. Members include representatives of the faculty, doctoral students, and administration. The President of The Graduate Center is the Chair of Graduate Council. The Executive Committee of Graduate Council formulates the agenda and brings actions to Graduate Council, which meets four times each year. Graduate Council is concerned with such matters as curriculum, degree requirements, standards of admission, academic performance, and program governance. Much of the work of Graduate Council is done through its standing committees. Elections of faculty and student program representatives to Graduate Council are required to be conducted annually, before April 1, by an election committee in each program; the basic formula for the election is one faculty and one doctoral student representative for each hundred or fewer matriculated doctoral students (GC Bylaws 2.1A–D).
If a student is not elected as the Graduate Council representative, the Doctoral Student Council representative is the default.

Doctoral Students' Council (DSC) – Summary

The Doctoral Students' Council and its officers are charged with representing student interests before the administration and external bodies.

In addition to informal and ongoing communications, the DSC officers meet with members of Graduate Center administration to report activities and exchange information.
Students may have issues presented by their DSC representatives or the DSC Executive Committee before the Doctoral Students' Council, or can personally address the Council by requesting to be put on the DSC agenda for an upcoming meeting. This may, in turn, result in discussion or actions taken within the DSC or between the DSC and the administration.

The DSC members also act as advocates for graduate student interests at the Board of Trustees, University Student Senate, University Faculty Senate, New York State Assembly, the Mayor's Office, and with Graduate Center administration.
Each spring, the DSC conducts elections for its representatives and student representatives to specific Graduate Center bodies. The nominations and elections process is held online; no paper ballots are mailed.
To make a nomination(s) for Program Representative, Advocate Advisory Board, OpenCUNY Board, At-large Representative, the Disciplinary Panel, Student Academic Appeals Officer, and the Student Elections Review Committee, see page 78.

Satisfactory Progress, Academic Honesty, Registration, Levels, and Advising

Satisfactory Progress

The Graduate Center requires its faculty to assess each semester whether students are making satisfactory progress. Those who are not making such progress will be asked to develop a plan to correct any shortcomings or will be asked to leave the program.

A DPH student is deemed NOT to be making satisfactory progress if she or he:

1. Has completed 36 credits and not passed the First Examination;
2. Has a cumulative grade point average below 3.00;
3. Has not completed the Second Examination within 48 credits of matriculating;
4. Has not completed the degree in six years*;
5. Has accumulated more than two open grades ("INC," "INP," "NGR," "ABS," and "ABP");
6. For students that do not have an MPH degree, not having completed all five core Master's level public health courses prior to enrolling in the second year of coursework.

If a student is found not making satisfactory progress a hold will be put on their record. A "SatProg" report is generated by the GC Registrar Office and both the DPH program office and the student is informed of the reason for the hold. A plan is developed by the student, advisor, and TC. The EO is informed of the student's progress and that plan submitted by the EO to the Student Affairs Office. Upon approval of the plan by the Vice President of Student Affairs, it is then submitted to the Registrar and the hold is lifted.

*The summer semester is considered an additional semester. For example, if a student takes courses in the fall, spring, and summer semesters in one academic year, this is reported as three semesters in the total 12 semester (6 year) allotment to complete the degree.

Academic Honesty

The Graduate Center outlines a clear definition of Academic Honesty and the DPH program expects students to know and follow the CUNY Academic Integrity Policy. Both can be found in the GC Student Handbook as well as through this link to the GC Avoiding and Detecting Plagiarism guide.
http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf

Registration
DPH students can register only after the Tracking Form is completed by the student and approved by their Advisor, TC and the EO. Students are responsible for ensuring that the form is reviewed and signed (electronic or physically) by the Advisor and Track Coordinator.

If you plan to register for:

- A course at another CUNY school that is not co-listed with a DPH program course (i.e. does not have a PUBH prefix).
  Students must submit a Permit Out form to the APO. The Permit Out form can be found on the GC Registrar webpage. Please note that each CUNY college has its own rules for permitting in and that additional steps apply for permitting out for summer courses.

- A course in another program at the GC that is not open to DPH students.
  All GC courses can be found on the Dynamic Course Schedule. Students must contact the instructor and request permission to register for the course. Please be aware that GC Program's set their own policies. Depending on the Program, the override will be set by the instructor, the APO, or the EO. The DPH administrators cannot set overrides for courses outside of the DPH program.

- PUBH 807 Practicum Project
  Students must fill out the Practicum Project Application available on Blackboard. Please see pages 12-14 of this manual. Students can register only after the application is approved.

- PUBH 861 Independent Study
  Students must fill out the Independent Study Application available on Blackboard. Please see page 17 of this manual. Students can register using a faculty-specific CRN* only after the application is approved.

- PUBH 891 Advanced Research Seminar II
  Students must have defended their Second Exam or have permission from the instructor and have the Second Exam defense scheduled within the first two weeks of the semester. Students must successfully defend the Second Exam to continue the course past the first two weeks of the semester. Please see pages 15, 39-46 of this manual.

- PUBH 900 Dissertation Supervision
  Students must inform the APO which faculty member you intend to study with. The APO will reply to you with a CRN* number. Please see pages 16, 47-70.

At this time, DPH students can register for Inter-University Doctoral Consortium courses, but can only register for courses listed or cross-listed within any of the consortium Graduate School of Arts and Sciences (GSAS). Please read the section Inter-University Doctoral Consortium in the GC Student Handbook for additional details. Fill out the Consortium Permit Out form and submit it to the APO for the EO's signature. The APO will then submit it to the Vice President for Student Affairs for approval.

*identifies a particular course and section offered for the semester.

Semester Course Schedules
Prior to each semester's registration period, the DPH program will distribute and post on Blackboard the DPH schedule that contains DPH course listings, suggested courses in other programs, and processes for registering.

The GC Dynamic Schedule is updated live by the GC Registrar.
https://ssb.gc.cuny.edu/prod/plsql/bwckschd.p_disp_dyn_sched

The DPH website is periodically updated with semester course listings.
http://www.gc.cuny.edu/Page-Elements/Academics-Research-Centers-Initiatives/Doctoral-Programs/Public-Health-DPH/Courses---Curriculum

Graduate Center Registrar
Refer to the GC Registrar webpage for Course Listings and Schedule, Academic Calendars, GC Publications (GC Bulletin; Student Handbook), and important downloadable forms.
http://www.gc.cuny.edu/Prospective-Current-Students/Current-Students/Registration

Curriculum Changes Over Time
Students should refer to the GC Bulletin or pages 9-29 for the requirements by their year admitted. Hard copies of previous year's Bulletins are available in the Library and Registrar's office. However, if the change is more rigorous, then the student is grandfathered into the previous curriculum. If the change is less rigorous, it overrides the previous curriculum. Finally, if a student left the program and was readmitted (not including formal leaves of absence) the Bulletin from when the student is readmitted is the one they should follow.

Status
All students are required to be in status each semester. This means that students must either be registered or be on an approved leave of absence. Individuals who are not in status will be considered withdrawn from the Graduate Center and an application for remittance must be submitted.
http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Forms/Readmission.pdf?ext=.pdf

Levels II and III
DPH students reach Level II after passing the completion of 45 credits and passing the First Exam. Tuition and status is atomically changed to full-time.

DPH students can request to be Advanced to Candidacy to Level III at the completion of all coursework (at least 48 credits) and passing the First and Second Exams and successfully defend their dissertation proposal. A student does not apply to be advanced to Level III and it is not "automatic." It is an online form that is submitted by the APO or EO and requires communication with the student. Once a student reaches the criteria noted, and if not flagged by either the Sponsor or Registrar, the student should contact the APO or EO and request to be advanced. The student should confirm the following: tentative or actual dissertation title; committee members and their roles; date of successful dissertation proposal defense, and the tentative or actual defense and deposit dates. Students must be advanced before deposit. Once a student is advanced, no changes can be made to the transcript. At this time, if the student has not had the Human Participants Clearance form submitted and processed (see page 51, dissertation proposal) the student will be asked to proceed with that process at advancement.

After advancement, tuition is atomically changed to full-time status and at a reduced tuition rate.

Waiving out of a DPH Program Course
With approval of the Advisor/Sponsor, Track Coordinator and Executive Officer a student may request to be waived from a DPH program course. If a course is waived, the student must replace the equal amount of credits with another course as approved by their advisor. For example, if a student took an advanced Masters level Epidemiology course deemed equivalent to PUBH 820 Epidemiologic Methods I, that student may be waived from PUBH 820 and will need to take a three-credit course in its place. Usual procedures for course waiver are to present a course description of the course taken elsewhere and the transcript noting the grade received or to pass an examination based on the course.

Weighted Instructional Units
Weighted Instructional Units (WIUs) are used to document that graduate study extends beyond traditional classroom learning. They do not have credit value but are a mechanism to recognize non-classroom academic work involved in earning a graduate degree. As such, they are used in calculations to determine if a student may be certified as having full-time status at The Graduate Center. They are typically used for more advanced students who have completed their coursework and are at the First Exam stage or beyond. Semester-specific WIU registration CRNs are distributed by the Registrar and the APO before each registration period. Students should register for 7 WIUs if full time status is necessary.

Faculty Advisors
A faculty advisor guides the student though the DPH coursework, completion of the first exam, and application for the second exam. Track Coordinators assign advisors before or during the student's first semester in the program. Advisors can also help students to develop dissertation ideas and suggest faculty who can serve as members of the Second Exam and dissertation committees. The faculty advisor may or may not serve as the student's second exam or dissertation sponsor.

The advisor will communicate with students to discuss course planning, academic issues, and career guidance. Advisors are also responsible for helping students make satisfactory academic progress towards their degree. Students are expected to communicate with their advisors at least twice a semester and more often as needed. Within the first year of coursework, students should discuss possible dissertation topics and research questions with their advisor, as well as potential faculty sponsors for the student's dissertation research.
Each semester the student will submit an electronic tracking form (on Blackboard) to their advisor for course selection approval. Students are responsible for ensuring that the form is reviewed and signed (electronic or physically).

Either a doctoral program faculty member or a student can request a change of advisor by discussing the request with the Track Coordinator, who must approve the change.

Coursework in the DPH Program

Credits

The DPH curriculum consists of 48 post-master's degree credits (note: the DPH Program is in the process of applying for approvals of a reduction in the number of credits associated with the dissertation of 12 to 0, for a total of 48. This manual reflects that change. If this change is not approved, an announcement will be made and an amendment to this manual will be posted on Blackboard). Students can take up to 6 credits within the CUNY SPH Master's in Public Health (MPH) Programs or other Master's level programs throughout CUNY. Students may also take up to 6 Independent Study credits at the Graduate Center. With the permission of their advisor and the EO, students may transfer in a certain amount (in general, no more than 12) of doctoral-level credits from other doctoral degree programs. For students who are waived out of a course, the same number of credits must be taken to replace the waived course. The degree must be completed within six years of matriculation or will be considered not making Satisfactory Progress, see page 5.

Students Without an MPH Degree

DPH students who do not have a Master's in Public Health (MPH) degree must have the five core MPH courses that are required by the CUNY SPH MPH programs completed by the end of their first year of enrollment. The five master's level courses are:

- Introductory Biostatistics
- Introductory Epidemiology
- Environmental Health
- Social and Behavioral Dimensions of Health
- Health Policy and Management

Three of the 5 prerequisite courses must be completed prior to acceptance into the DPH program. None of these credits will count toward the doctoral degree even if the remaining two master's-level courses are taken while matriculated in the DPH program. It is the responsibility of the student, in consultation with his/her Advisor and Track Coordinator, to ensure that remaining core MPH courses are completed within the first year of enrollment. Failure to do so will be considered not making Satisfactory Progress (see page 5) toward to degree and will interfere with the academic progress of the student.

Coursework and Curriculum

In keeping with the interdisciplinary focus of the DPH program, all students are required to take public health courses within a specialization area, additional courses in research methods, theory or public health practice, and at least one doctoral course outside of public health. Course selection is determined through consultation between the student and the advisor. If a DPH course is cross-listed with another GC program, that course can count toward the interdisciplinary requirement.

Students are required to complete the core DPH courses, track-specific course requirements, advanced research seminars and dissertation research.

Overview of Required Courses for all DPH Students

Requirements for all DPH students:	
PUBH 800	Cities, Society, and Health
PUBH 801	Interdisciplinary Approaches to Urban Health Research
PUBH 805/802 (EPI take PUBH 824)	Quantitative Research Methods with Applications to Urban Health
PUBH 806 (2012 and following cohorts)	Qualitative Research Methods with Application to Urban Health
PUBH 893	Leadership & Organizational Change Seminar
PUBH 807	Practicum Project
PUBH 820	Epidemiologic Methods I
PUBH 890	Advanced Research Seminar I
PUBH 891	Advanced Research Seminar II
PUBH 900	Dissertation Supervision
PUBH 898	Dissertation Seminar

Core Courses

PUBH 800 Cities, Society, and Health (3 credits): This course presents an ecological, multilevel approach to the study of urban health and brings together public health and social science disciplines to examine the impact of city living on population health.

- *Required for all cohorts, all tracks*

PUBH 801 Interdisciplinary Approaches to Urban Health Research (3 credits): This course prepares students to investigate causes and solutions to complex urban health problems by bringing together concepts, theories and methods from a variety of disciplines that contribute to our understanding of urban health. It also focuses on research that contributes to reducing health disparities and promoting well-being in urban communities.

- *Required for all cohorts, all tracks*
- *Prerequisite: PUBH 800*

PUBH 805 Quantitative Research Methods with Applications to Urban Health (3 credits): This course will introduce students to intermediate level approaches and applications in conducting quantitative research in urban public health. It follows introductory biostatistics and epidemiology courses. Course objectives include understanding the assumptions, application, and interpretation of generalized linear regression models, including linear, logistic, Poisson, and proportional hazards models; understanding standard methods for making inferences on model parameters, including Wald testing and ratio testing; and being able to fit generalized linear regression models and diagnose the appropriateness of models using standard statistical software. Particular attention will be made to choosing and defining the right outcome(s), given specific research questions and available data; defining appropriate comparison groups; and understanding the assumptions of each model in order to make appropriate choices and analytic decisions for different types of data and research questions common to urban health research. Labs will allow students to practice these new skills. The final examination will include a project in which students develop and carry out an analysis of an urban health research question using a publically accessible dataset.

- *Required for all cohorts in CSH, EOH, and HPM tracks. For EPI students PUBH 824 Applied Biostatistics should be taken in its place*
- *For cohorts preceding 2012, this course should be used to meet the prior requirement for PUBH 802 Advanced Methods & Ethical Issues in Urban Health Research*
- *Prerequisite or Co-requisite: 820 Epidemiologic Methods I or equivalent*

PUBH 806 Qualitative Research Methods with Application to Urban Health (3 credits): This course will introduce students to approaches in designing and conducting qualitative research in topics of relevance to public health. It is intended to provide doctoral students with a foundation in the various qualitative data collection and analysis methods, focusing on their application to public health practice and research. It will cover elements of qualitative research design, data collection, analysis, and writing for publication. This will be integrated with the main assignment in which students develop a proposal for a qualitative research project tailored to address a specific public health research question.

- *Required for the 2012 and following cohorts*

PUBH 807 Practicum Project(3 credits) (Pass/Fail): The DPH Practicum Project is a planned, supervised and evaluated experience that allows students to apply the knowledge and skills that they have acquired through learning experiences in a practice setting. The DPH Practicum Project requires 180 practicum hours that can be completed in a range of organizations across New York City or elsewhere. Students must document how the 180 practicum hours are spent. The student must complete a detailed learning plan, a summary report (that includes objectives), a self-evaluation, and a final report. It is the belief of the DPH Program and the CUNY School of Public Health that there is always a new topical, methodological, or positional approach that will allow students to gain new experience or skills or benefit from the additional practical experience. Therefore, the Practicum Project requirement cannot be waived, as even students with extensive experience in public health practice and leadership can benefit from applied public health experiences that they have not yet encountered in their careers.

A Practicum Project requires a Practicum Sponsor. A Practicum Sponsor is usually not a DPH faculty member, nor faculty of another academic organization, because the Practicum Project is meant to be action-oriented, leading to public health action. However, the proposed Practicum Project may meet this criterion if it involves collaboration between the CUNY SPH or another academic organization and an external, non-academic organization, with the express purpose of producing work that generates public health action.

Before the student registers, the PUBH 807 Practicum Project Application must be approved by the Practicum Sponsor and the Course Instructor (on Blackboard).

The content of Practicum Projects must be related to public health action and be practice-oriented. A Practicum Project can include any aspect of public health practice, including leadership, practice-based research or evaluation, dissemination, primary data collection, data management, data analysis, manuscript/report preparation, policy development or analysis, community-based or organizational capacity building in public health, conducting a systematic literature review, designing data collection instruments, developing research/evaluation/intervention protocols, and developing grant proposals. While any of this work can be part of a project team, the work that is specifically being conducted by the student and the student contribution to the project (over and above those of others on the project team) must be clearly delineated and approved by the Practicum Sponsor. See the Frequently Asked Questions on the next page.

The student will develop a detailed learning/work plan that includes the hours/dates associated with all activities, project objectives, a description of activities, and a description of the final product and how it will be assessed. This will be reviewed and approved by the Practicum Sponsor and will be used to evaluate the student at the end of the project. The student meets with the Practicum Project Sponsor weekly. The final assessment will be based primarily on the final practicum report, which must document the achievement of each of the project objectives. Each must include a detailed self-evaluation, a summary of the project activities and how the project objectives were met. The Practicum Sponsor must evaluate the final project and assign a pass/fail grade (where fail is less than 70%). The final Practicum Project grade will be determined by this grade in combination with grades given by the Course Instructor for three other submissions completed over the Project period: Detailed Learning Plan (15%), Progress Report (10%), Final Report (60%), Self-evaluation/Reflection (15%). The Course Instructor assigns the final grade.

- *Required for all cohorts, all tracks**
- *Approval of Application by Practicum Sponsor and Course Director*
- *Prerequisites: PUBH 800;PUBH 801*

PUBH 807 Practicum Project- Frequently Asked Questions

How many practicum hours must the DPH Practicum Project be to fulfill the program requirement? Am I required to complete these hours on a full-time working basis, or can they be spread out over time?

- Students must complete 180 hours on the DPH Practicum Project to fulfill the program requirement, but these hours may be spread out over the days and weeks of the semester.

What if I am unable to complete my DPH Practicum Project in one semester – can I take an Incomplete in the course, and complete it during the following semester?

- While the program discourages students from taking Incompletes, under some circumstances, an Incomplete may be the only option. For example, when a student's project work requires a longer period of time than the academic semester, or a different period of time, which extends into the next semester. This situation may arise due to the nature of the project or because of the practicum sponsor organization's timeline. A request for an Incomplete must be approved by the Course Instructor, and the incomplete grade must be resolved by the end of the subsequent semester.

I've worked in the public health field for many years, including in leadership positions, on many health issues, and across public and private sectors. Can I waive the DPH Practicum Project requirement and receive equivalent credit for my professional experience?

No. The DPH Practicum Project requirement may not be waived under any circumstance. It is the belief of the Program and the CUNY School of Public Health that there is always a new topical, methodological, or positional approach that will allow students to gain new experience or skills or benefit from the additional practical experience.

I already consider myself a public health professional. What are the goals of the DPH Practicum Project? What is the additional expertise or experience I'm expected to gain from this program requirement?

- The DPH Practicum Project is intended to provide students with real world experience in public health practice. Students should plan a Practicum Project in an area in which they do not have extensive experience in order to gain new skills and experience. This could take many forms, but must provide an application of public health knowledge and skills, and be action-oriented, i.e., work that leads to public health action. For example, students could work on designing or implementing a program, writing a grant, promoting an idea or policy via a report or a set of targeted papers or a series of policy briefs, etc.

Can I complete the DPH Practicum Project by doing research work with a faculty member at CUNY SPH or a faculty member at another academic institution?

- The main requirement for the DPH Practicum Project is that it must be conducted at or in collaboration with an external non-academic organization engaged in or with a mission of public health practice. The Practicum Sponsor for the DPH Practicum Project may be based at an academic organization, including CUNY SPH, but the work must be conducted in partnership with the external non-academic organization.

If I've identified an organization where I would like to complete my DPH Practicum Project, can I just tell them what I want to do there? What role do they have to play in the development and design of my project?

- Students must work collaboratively with the potential practicum sponsor organization to design and develop their DPH Practicum Project in accordance with the expectations of the DPH program. The work of the DPH Practicum Project must be linked to the practice mission of the practicum sponsor organization, including if it is an academic partnership, and oriented to develop the goals and objectives of that work.

What are the DPH Practicum Project criteria?

- First, the Practicum Project must be clearly oriented towards public health practice; the learning/work plan for the proposed Project must clearly reflect how it will contribute to public health action. Second, the Practicum Project must be directly linked to the mission, goals, and objectives of the practicum sponsor organization. Third, the Practicum Project must be conducted at or in collaboration with an external non-academic organization; an academic partnership, with CUNY SPH or some other academic organization, is acceptable, as long as the work is shaped by a practice orientation, rather than research.

Can I conduct research and write a paper for publication in the peer-reviewed literature as my DPH Practicum Project?

- Research and writing for publication alone do not meet the core expectations for the DPH Practicum Project. While these activities may be involved or even central, student practicum work must involve more than the generation and/or synthesis of knowledge. For example, a systematic literature review would be acceptable if it was linked to a public health practice goal of the practicum sponsor organization, such as if the review would be presented as evidence for the need to develop or modify a particular public health-related policy or intervention. As noted above, the Project must involve work that leads to public health action.

** Students in the 2013 and preceding cohorts who have not completed the Leadership Project may do so by registering for the PUBH 807 Practicum Project. Depending on cohort requirements (2012 and 2013 Cohorts: PUBH 89201 and 02 Leadership Project; 2011 and Preceding Cohorts: PUBH 89201 and 02 Leadership Project & a 3 credit leadership elective) this option will require replacing credits (3 or 6) with additional course(s).*

PUBH 820 Epidemiologic Methods I Research Design and Inference (3 credits): This course provides an intermediate-level understanding of the design and conduct of epidemiologic studies, including causal inference, measurement, major study designs, threats to validity, and their application to public health issues. The class includes lectures on research methods, hands-on data analysis exercises, discussions about determining causation through epidemiological research.

- *Required for all cohorts, all tracks*

PUBH 893 Leadership & Organizational Change Seminar (3 credits): The Public Health Leadership Seminar introduces students to theories and models of leadership and organizational change and helps students to analyze their own strengths and weaknesses as leaders. Using a case study approach, students analyze successful and unsuccessful examples of public health leadership and organizational change.

- *Required for all cohorts, all tracks*
- *Prerequisite: PUBH 800;PUBH 801*

Research and Dissertation Seminars

All students are required to complete an original dissertation research project. For a full explanation of this process, see pages 47-70 for Dissertation Guidelines. To prepare for the dissertation, students take two research seminars, the first within the second year of coursework (PUBH 890) and the second after completing all required courses (PUBH 891). While students are writing the dissertation, they register for PUBH 900 Dissertation Supervision and PUBH 898 Dissertation Seminar.

PUBH 890 Advanced Research Seminar I (3 credits): Students develop specific research questions pertaining to potential areas of interest for their doctoral dissertations and prepare a proposal that specifies a research question, a public health rationale for the study and an appropriate research design and methods. Students will be expected to complete a literature review and design a study, which may later lead to a dissertation proposal.

- *Required for all cohorts, all tracks*
- *Prerequisites: PUBH 800; PUBH 801*

PUBH 891 Advanced Research Seminar II (3 credits): Guides advanced students in the completion of their dissertation proposal and, if needed, Institutional Review Board (IRB) application for dissertation research. Faculty assist students to refine the research design, to fully develop appropriate research methods and analytic strategies and to provide protection for human subjects in their dissertation research. In order to take PUBH 891 Research Seminar II, students need to have defended the Second Exam or have permission of the instructor and have the Second Exam defense scheduled within the first two weeks of the semester. Students must successfully defend the Second Exam within the first two weeks of the semester in order to remain in the course.

As part of PUBH 891 students are required to complete and submit The Dissertation Progress Report.

The online component of CUNY's Responsible Conduct of Research (RCR) is a required part of this course. DPH students will be exempt from the in-person workshop of CUNY's RCR.

- *Required for all cohorts, all tracks*
- *Prerequisites: All other coursework; successful defense of the Second Exam*

PUBH 898 Dissertation Seminar (0 credits): This is a non-credit required course that students must take every semester they are working on the dissertation and registered for PUBH 900. The dissertation seminar meets up to four times a semester and serves as a workshop in which students attend Public Health Grand Rounds, present and discuss their dissertation research, and review aspects of each other's work (peer review).
The student must be registered for this course number in the same or preceding semester the student deposits the dissertation. After the student is advanced to candidacy, this course number will appear as audit on the transcript. See pages 47-70.

- *Required for all cohorts, all tracks*
- *Prerequisites: All coursework and exams*
- *Taken only while working on the dissertation and registered for PUBH 900*

PUBH 900 Dissertation Supervision (0 credits): Students pursue doctoral research leading to the required dissertation under the supervision of their dissertation sponsor. Doctoral faculty provide supervision on research design, data management and analysis, presentation and interpretation of findings.
The student must be registered for this course number in the same or preceding semester the student deposits thee dissertation. After the student is advanced to candidacy, this course number will appear as audit on the transcript. See pages 47-70.

Grades of NRP (No Record of Progress) or SP (Satisfactory Progress) will appear when the student is enrolled and will change to P when the student graduates.

- *Required for all cohorts, all tracks*
- *Prerequisites: All coursework and exams*
- *Taken only while working on the dissertation and registered for PUBH 898*

Examinations

Students in all cohorts and all tracks take two examinations to test their mastery of the curriculum. Students must apply in advance to take each exam and students must be in good academic standing to apply. The First Exam is given after students have completed core coursework. Students work on the Second Exam after all required coursework has been completed except PUBH 891 and the dissertation (PUBH 900 & PUBH 898). Students cannot take PUBH 891 or begin their dissertation research until they have passed this exam. See pages 37-46 for more details on the First and Second Examinations.

Topics Courses and Independent Study

PUBH 851 Topics in Public Health (1-3 credits): All provisional DPH electives are listed with the number PUBH 851. A provisional elective may run a total of three semesters, after which it must be approved by the Curriculum Committee and FSC and assigned a permanent course number.

PUBH 861 Independent Study (1-3): Students may work with a DPH faculty member sponsor on an independent study project ranging from 1-3 credits. A total of 6 independent study credits may be used toward the degree. A faculty member may not be on sabbatical while acting as an independent study sponsor. Faculty outside of the DPH program cannot sponsor an independent study, nor can adjunct faculty. Independent study can only be registered for during the regular academic year. As a guide, a one credit independent study should correspond to about 45 hours of work (3 hours per week X 15 weeks), a two credit independent study should correspond to about 90 hours of work (6 hours per week X 15 weeks), and a three credit independent study should correspond to about 135 hours of work (9 hours per week X 15 weeks). Applications for Independent Study can be found on Blackboard.

The sponsoring faculty member and student must have a one-page independent study proposal approved by the student's advisor and TC. The proposal must include learning objectives, milestones, evaluation criteria, and a timeline with a final evaluation by the sponsoring faculty member.

Community, Society, and Health (CSH)

This track prepares researchers and public health practitioners to advance scientific understanding of the social determinants of health, health behaviors, the delivery of health services, and the development of sound health policies. CSH graduates will be able to lead, plan, manage, and evaluate community health interventions. The track draws on the methods and theories from multiple disciplines to prepare students to design and implement public health programs and research/evaluation studies.

The CSH Track prepares researchers and public health practitioners who can:

- Advance scientific understanding of the social determinants of health, health behaviors, the delivery of health services, and the development of sound health policies.
- Lead, design, manage, and evaluate community health interventions.
- Draw on the methods and theories from multiple disciplines to design and implement research studies on population health.
- Formulate, analyze and advocate for policies that promote health and prevent disease.
- Teach students and professionals about the social determinants of health, health behaviors, health interventions, health policy, and health disparities.

Curriculum:
The core curriculum in CSH includes courses on social dimensions of health theories and research methodology. Electives are chosen in consultation with the faculty advisor.

Requirements for all CSH students:	
PUBH 810	Community Health Interventions: Theory and Methods
PUBH 811	Social and Behavioral Dimensions of Health: Theory and Methods
PUBH 816 (2012 and following cohorts)	Evaluation of Public Health Programs and Policies
Plus, cohorts preceding 2012:	
Five electives in research methods or public health practice, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement), one leadership elective, Public Health or MPH courses on population or health problem specific issues; one elective course on social aspects of health in sociology, psychology, anthropology or related fields; and two research methods courses.	
Plus, cohorts 2012 & 2013	
Three advanced research methods or track-specific practice courses, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement).	
Plus, cohort 2014 and following	
Four advanced research methods or track-specific practice courses, of which one must be from a Graduate Center department outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement).	

PUBH 811 Social and Behavioral Dimensions of Health: Theory and Methods (3 credits): This course prepares students to understand the impact of social structures and social environments on health and health behavior. Using an interdisciplinary approach, the course examines the contributions of sociology, anthropology, economics, psychology, history and political science to the study of health and health behavior.

• *Required for all CSH students*

PUBH 810 Community Health Interventions: Theory and Methods (3 credits): This course prepares students to lead research/intervention teams that plan, implement and evaluate community health interventions in community settings**.**

- *Required for all CSH students*
- *Prerequisite or co-requisite: PUBH 811*
- *At least two Master's level courses in program development or evaluation and at least one year of work experience in community health settings. These requirements can be waived with permission of instructor for students who bring other relevant experiences to the course.*

PUBH 816 Evaluation of Public Health Programs and Policies (3 credits): Prepares students to design evaluations of public health programs and policies; uses a systems approach to identify key constituencies and tasks in evaluation; students design an evaluation of an existing program or policy.

- *Required for the 2012 cohort and following cohorts*
- *For cohorts preceding 2012, this course can be used toward an elective requirement. Please check with your advisor.*

Epidemiology (EPI)

The mission of the Epidemiology Track of the DPH Program is to train epidemiologists as researchers and public health practitioners with a set of core competencies making them capable of rigorously applying epidemiological and biostatistical methods to the wide array of public health challenges. This includes the ability to: authoritatively generate, contribute, and disseminate new knowledge to their fields through research; to be critical consumers of evidence generated by others in their field; and to become independent, lifelong learners in development and application of epidemiologic methods. This mission is achieved through the teaching of epidemiologic methods and their applications to pressing public health problems, promotion of independent learning, and hands-on mentoring of rigorous, impactful and innovative epidemiologic research in the dissertation phase.

Curriculum:
The core curriculum in EPI includes coursework in epidemiologic methods and statistical methods. Electives are chosen in consultation with the faculty advisor.

Requirements for all EPI students:	
PUBH 821	Epidemiologic Methods II: Study Design and Analysis
PUBH 822	Epidemiologic Methods III: Seminar in Epidemiologic Methods
PUBH 823	Epidemiologic Methods IV: Seminar in applications of epidemiologic methods to urban health
PUBH 824 (required for the 2014 cohort and following)	Applied Biostatistics I
PUBH 825 (required for the 2014 cohort and following)	Applied Biostatistics II
Plus, cohorts preceding 2012:	
Four electives, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement), one leadership elective, two in statistical methods and one elective in a specific content area, 2 electives, GC or Public Health courses in statistics, one of which can be a course in a software package and one in population or health-issue specific; and one elective course on statistics in sociology, psychology, or other related fields.	
Plus, cohorts 2012 and following	
Three advanced research methods or track-specific practice courses, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement).	

PUBH 821 Epidemiologic Methods II: Study Design and Analysis (3 credits): Through lectures and problem-solving workshops, this course broadens the approach to epidemiologic methods, incorporating principles from Methods I into the design and conduct of studies and analysis of epidemiologic data. It consists of lectures and problem-solving workshops.

- *Required for all EPI students*
- *Prerequisite: PUBH 820 or equivalent or permission of track coordinator*

PUBH 822 Epidemiologic Methods III: **Seminar in Epidemiologic Methods (3 credits):** This seminar exposes students to emerging concepts and methods in epidemiologic research and provides students with an opportunity to apply new methods and consider how these strategies complement, and advance the more commonly used strategies in epidemiology.

- *Required for all EPI students*
- *Prerequisite: PUBH 821*

PUBH 823 Epidemiologic Methods IV: **Seminar in applications of epidemiologic methods (3 credits):** This seminar is intended to help students integrate the concepts and methods of epidemiologic research with specific inquiry directed at understanding, and improving the health of populations. This seminar requires students to develop proposals for epidemiologic research, identify strategies for data analysis that incorporate the lessons learned in Methods courses I, II, and III and to examine the application of those strategies to existing research. This course helps "bring together" the epidemiology theory and methods that have been discussed throughout the rest of the curriculum to the particular exigencies of public health research.

- *Required for all EPI students*
- *Prerequisite: PUBH 822*

PUBH 824 Applied Biostatistics I (3 credits):
For public health professionals to be effective, they must be able to ensure that policies and interventions are evidence-based. Epidemiologists design studies to determine which policies and interventions are most effective in promoting healthy individuals, families and societies. Biostatistics provides epidemiologists with the necessary tool kit to appropriately analyze public health data. The emphasis of this class is on acquiring a

set of foundational tools in regression models to apply to public health research questions and data. Topics include simple and multiple linear regression, logistic regression, ordinal and polytomous regression and model building techniques including assessing for multi-collinearity, effect measure modification, non-linearity and model fit statistics.

- *Required for the EPI 2014 cohort and following*
- *For EPI students, this course should be taken instead of PUBH 805*
- *Co or Prerequisite: Graduate-level introductory biostatics course*

PUBH 825 Applied Biostatistics II (3 credits):
This course is designed to expand on the biostatistical methods covered in Applied Biostatistics I to deepen the analytic repertoire of students with respect to regression modeling through the introduction of loglinear and generalized linear models including Poisson and Negative Binomial regressions as well as introduce techniques for analysis of longitudinal data including random and mixed effect models, and survival analysis.

- *Required for the EPI 2014 cohort and following*
- *Prerequisite: PUBH 824*

Environmental and Occupational Health (EOH)

The EOH track trains doctoral-level researchers and teachers about Environmental and Occupational Health problems affecting populations. Students have backgrounds in environmental science, occupational health, industrial hygiene, environmental policy, environmental epidemiology, and other related fields. The program includes a focus on Environmental and Occupational Health regulation, as well as planning and its impact on human health. The curriculum combines an understanding of how elements of the urban infrastructure – e.g., the built environment, commerce and productive activities, energy and communication systems, water, waste management and transport systems – interact with macrosocial trends (e.g., demographic, economic, and political processes) to affect environmental conditions (e.g., air, water, land and workplace) and human health. Coursework and research is aimed at furthering scientific understanding of the ways in which urbanization compromises the physical environment and human health as well as the ways in which it promotes health. topics such as environmental sustainability, environmental justice, economic viability, and political participation are examined.

The EOH track will produce graduates who can:

- Advance the scientific understanding of the impact of environmental and occupational conditions on health and disease.
- Plan, lead and manage studies to monitor and evaluate the heath effects of potential hazards in the workplace and broader environment.
- Plan, direct, manage and evaluate environmental and occupational health programs.
- Teach students and professionals about the impact of environmental and occupational hazards on the health of populations and about strategies for controlling such exposures.

Curriculum:
The core curriculum in EOH includes courses on the health impacts of the physical environment and research methodology. Electives are chosen in consultation with the faculty advisor.

Requirements for all EOH students:	
PUBH 830	Emerging Issues in Environmental and Occupational Health
PUBH 831	Environmental and Occupational Health Risk Assessment, Management and Communication in Urban Settings
One urban environment course (required for the 2014 cohorts and following)	
Plus, cohorts preceding 2012:	
Five electives: two in research methods in environmental or occupational health, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement), one leadership elective, one course in statistics or instrumentation; one course in geographic information systems.	
Plus, 2012 cohort and following	
Four advanced research methods or track-specific practice courses, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement) and one must be a course focusing on the urban environment.	

PUBH 830 Emerging Issues in Environmental and Occupational Health (3 credits): This course examines the impact of macro-level trends – such as corporate globalization, immigration patterns, and technological development – on the urban physical environment. It focuses on the relationship between the urban infrastructure (e.g., housing, transportation, sewage and waste disposal) and environmental media (e.g., air quality, water quality and land use). This course also examines the impact of macro-level trends on occupational health and safety conditions, focusing on such issues as outsourcing of manufacturing jobs to developing nations, the rise in the service and informal economies, immigrant labor, de-unionization, the new working class and the loss of the safety net. It examines the effectiveness of current policies in addressing these problems. Through focused readings and in-depth examination of case studies, students develop the tools for analyzing how macro-social trends affect the urban physical environment, workplaces and health. Teams of students then analyze an environmental and occupational issue, illustrate how it affects urban communities, and develop solutions to reduce environmental and occupational health burdens.

- *Required for all EOH students*

PUBH 831 Environmental and Occupational Health Risk Assessment, Management and Communication in Urban Settings (3 credits): This course examines the development and use of Environmental and Occupational Health risk assessment and its policy implications as applied to urban settings. Approaches to assessing, communicating about and managing urban Environmental and Occupational Health risks are critically analyzed within their political, economic, social and cultural contexts. Risk assessment and risk management procedures are evaluated in light of several themes including public participation, sustainable development, environmental justice, and natural and technological hazards. Students conduct risk assessments on real world environmental and occupational health problems, develop effective written and verbal approaches to communicating the results of risk assessments, and critically review case studies in which Environmental and Occupational Health risk assessments have been used in setting public policy.

- *Required for all EOH students*

Health Policy and Management (HPM)

The HPM track prepares students for careers in research, teaching, policy analysis and organizational analysis in the broad fields of health services, health policy, and health management. Students will select a concentration in either Health Policy or Health Management. Students who choose Health Policy as a concentration will develop a nuanced understanding of how a range of mechanisms are systematically associated with policy and influence population health. Students who choose Health Management as a concentration will incorporate organizational theory and analysis in understanding how organizational structures, networks, and behavior influence the health of populations.

The HPM track will prepare graduates who can:

- Contribute to new knowledge about the mechanisms that influence the delivery of health services and public health programs and the development of health policy.
- Develop and manage initiatives to strengthen the functioning of health systems, health care organizations and public health agencies and programs.
- Develop, advocate for and implement health care and public health policies.
- Analyze the impact of health and non-health policies on population health.
- Teach students and professionals about the social determinants of health, health interventions, health policy, health management and health disparities.

Curriculum:
The core curriculum in HPM includes coursework in management and research methods. Electives are chosen in consultation with the faculty advisor.

Requirements for all HPM students:	
PUBH 840	Seminar in Health Policy and Management
PUBH 841	Quantitative Methods in Health Services Research
PUBH 842 (required for the 2014 cohorts and following)	Public Health Economics
PUBH 843 (required for the 2014 cohorts and following)	Health Policy Analysis Methods
Plus, cohorts preceding 2012	
Five electives: one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement), one leadership elective, one course in policy or management (economics, sociology, and political science); two research methods courses (one in economics or finance; one in research design, data analysis, econometric analysis, quantitative decision analysis, policy analysis, management, or practice).	
Plus, 2012 cohort and following	
Four advanced research methods or track-specific practice courses, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement) and one must be a Health Economics course.	
Plus, 2014 cohort and following	
Three advanced research methods or track-specific practice courses, of which one must be from a Graduate Center department outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement).	

PUBH 840 Seminar in Health Policy and Management (3 credits): The objective of the course is to understand patterns in the organization, financing, and delivery of health care, and their relationship to population-based health outcomes, through an integrated exploration of research from the various disciplines informing the health policy and management fields. With an emphasis on the development of critical thinking skills, students are introduced to multidisciplinary models from the social sciences as conceptual sources for health policy and management research. The course adapts a transdisciplinary approach to the examination of important topics in urban public health management and policy, such as the relationship between health systems and the urban-based health economy, and the interface between managerial functions and health policy analysis in addressing health status and outcomes disparities.

- *Required for all HPM students*

PUBH 841 Quantitative Methods in Health Services Research (3 credits): This course focuses on quantitative reasoning skills in health services research within the context of the principles of the scientific method and the logic of the research process. The logic and methodologies of problem formulation, development of hypotheses and objectives, multidisciplinary research design, sampling, operationalization and measurement are reviewed in connection with selected analytic strategies, such as cross-section/time-series design, multilevel analysis, cost effectiveness analysis, and health impact assessment. Methodological connections between practice-based performance assessment for management and population-based health outcomes assessment for policy are addressed.

- *Required for all HPM students*
- *Prerequisite: PUBH 840*

PUBH 842 Public Health Economics (3 credits): The broad literature on health economics helps improve the understanding of issues related to public health and its influence in the decision-making process of cost-effective interventions for the overall population health. The emphasis of this class is on acquiring a set of devices from the economic theory and a framework within which to organize empirical analysis to inform health and public health policy. Topics will include the analysis of the overall health market, and in particular the analysis of the demand for health, health care and insurance, the supply of health care and insurance, the

market structure of the health care sector, and, finally, the positive and normative aspects of performance of the health care sector.

- *Required for the 2014 cohort and following*

PUBH 843 Health Policy Analysis Methods (3 credits): This course is designed to expand and deepen the analytic repertoire of students with respect to (1) the analysis of problems or issues that face health policy-makers; (2) the analysis of alternative solutions so those problems and (3) the evaluation of selected solutions (including doing nothing). The course uses research and analytic methods drawn from epidemiology, decision sciences, political science, sociology, social psychology and economics. It emphases how methods developed within these disciplines can be applied to policy analysis in public health and health care.

- *Required for the 2014 cohort and following*
- *Pre or Co-requisites PUBH 840 and PUBH 841*

Course Sequencing

* Required for the first exam § Has prerequisites † Has Pre or Co-requisites	Part time: 4 courses an academic year Full time: 7 courses an academic year

Requirements for all Tracks - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time**	**Part Time**	**Semester Typically Offered**
PUBH 800	Cities, Society and Health*	1st year	1st year	Fall
PUBH 801	Interdisciplinary Approaches to Urban Health Research*§	1st year	1st year	Spring
PUBH 805	Quantitative Research Methods with Applications to Urban Health*† (CSH, HPM, EOH)	1st year	2nd year	Fall
PUBH 806	Qualitative Research Methods with Application to Urban Health*	1st year	1st year	Spring
PUBH 820	Epidemiologic Methods I*	1st year	1st or 2nd year	Fall/Spring
The First Exam	Requirements to apply for the First Exam are marked with an*	1st year	2nd year	2 weeks before Fall Semester
PUBH 890	Advanced Research Seminar I§	2nd year	3rd year	Fall
PUBH 893	Public Health Leadership Development Seminar§	2nd year	3rd year	Fall
PUBH 807	Practicum Project§	2nd or 3rd year	3rd or 4th year	Fall/Spring
The Second Exam	Eligible after all coursework completed except PUBH 891, PUBH 898, and PUBH 900.	3rd or 4th year	4th or 5th year	Student's own schedule (~4-9 months)
PUBH 891	Advanced Research Seminar II§	3rd or 4th year	4th or 5th year	Fall/Spring
PUBH 898	Dissertation Seminar§	4th and 5th years	5th and 6th years	Fall/Spring
PUBH 900	Dissertation Supervision§	4th and 5th years	5th and 6th years	Fall/Spring

Requirements for CSH - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time:** 1st year - Two courses from this section for the first exam*	**Part Time:** 1st year - One course from this section for the first exam; 2nd year - A second course from this section for the first exam*	**Semester Typically Offered**
PUBH 810	Community Health Interventions†	1st or 2nd year	1st, 2nd, or 3rd year	Spring
PUBH 811	Social & Behavioral Dimensions of Health	1st year	1st year	Fall
PUBH 816	Evaluation of Public Health Programs and Policies	1st or 2nd year	1st, 2nd, or 3rd year	Fall
Four advanced research methods or track-specific practice courses, one of which one must be from a Graduate Center department outside of Public Health.		1st or 2nd year	1st, 2nd, or 3rd year	Fall/Spring

Requirements for EPI - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time:** 1st year - Two courses (in addition to PUBH 824) from this section for the first exam*	**Part Time:** 1st year - One course (in addition to PUBH 824) from this section for the first exam; 2nd year - A third course from this section for the first exam*	**Semester Typically Offered**
PUBH 821	Epidemiologic Methods II§	1st or 2nd year	1st or 2nd year	Fall
PUBH 822	Epidemiologic Methods III§	1st or 2nd year	1st or 2nd year	Spring
PUBH 823	Epidemiologic Methods IV§	2nd or 3rd year	3rd or 4th year	Fall
PUBH 824	Biostatistics I*	1st year	1st year	Fall/Spring
PUBH 825	Biostatistics II§	1st or 2nd year	1st, 2nd, or 3rd year	Fall
Three advanced research methods or track-specific practice courses, one of which one must be from a Graduate Center department outside of Public Health.		1st or 2nd year	1st, 2nd, or 3rd year	Fall/Spring

Requirements for EOH - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time:** 1st year - Two courses from this section for the first exam*	**Part Time:** . 1st year - One course from this section for the first exam; 2nd year - A second course from this section for the first exam*	**Semester Typically Offered**
PUBH 830	Emerging Issues in EOH	1st or 2nd year	1st or 2nd year	Every other Fall or Spring
PUBH 831	Environmental & Occupational Health Risk Assessment	1st or 2nd year	1st or 2nd year	Every other Fall or Spring
One Urban Environment course (3 credits)		1st or 2nd year	1st, 2nd, or 3rd year	Fall/Spring
Four advanced research methods or track-specific practice courses, one of which one must be from a Graduate Center department outside of Public Health.		1st or 2nd year	1st, 2nd, or 3rd year	Fall/Spring

Requirements for HPM - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time:** 1st year - Two courses from this section for the first exam*	**Part Time:** . 1st year - One course from this section for the first exam; 2nd year - A second course from this section for the first exam*	**Semester Typically Offered**
PUBH 840	Seminar in Health Policy and Management	1st or 2nd year	1st or 2nd year	Fall
PUBH 841	Quantitative Methods in Health Services Research§	1st or 2nd year	1st or 2nd year	Spring
PUBH 842	Public Health Economics	1st or 2nd year	1st or 2nd year	Spring
PUBH 843	Health Policy Analysis Methods†	1st or 2nd year	1st or 2nd year	Fall
Three advanced research methods or track-specific practice courses, one of which one must be from a Graduate Center department outside of Public Health.		1st, 2nd, or 3rd year	1st, 2nd, or 3rd year	Fall/Spring

Concentration in Nutrition

The Nutrition Concentration is open to students in any specialization track who have prior training in nutrition, food sciences or food policy. Students can learn more about the requirements and expectations of the concentration by consulting Professor Arlene Spark, Coordinator of the concentration, or their Track Coordinator. Students in the concentration are expected to complete four courses (12 credits) that meet both track and concentration requirements, i.e., no extra credits are required. PUBH 814 Food Politics and Policies or its equivalent; SOC 828 Food, Culture and Society or its equivalent; an advanced three credit epidemiology course relevant to nutrition (e.g., Nutritional Epidemiology; Chronic Disease Epidemiology, Life Course Epidemiology) and one three credit elective in research methods relevant to public health nutrition.

PUBH 814 Food Politics and Policies (3 credits): This is a policy course that examines the effects of the food industry and government on diet-related disease, and on health promotion and disease prevention. Most readings have a strong political content. Central themes include: government action versus individual liberty, the contradictions of government support and opposition to certain policies, the role of litigation, and the importance of institutions (e.g., bureaucracy, Congress, the media).

SOC 828 Food, Culture and Society (3 credits): This course explores major issues in foodways, focusing on preparation and consumption, through readings and discussions as well as through the development of a culturally-informed public health nutrition initiative and fieldwork exploring a specific cultural food tradition. Theoretical frameworks include the food voice, cultural studies, political economy, and symbolic interactionism. Materials are drawn from across the social sciences and applied to public health.

Concentration in Maternal, Child, Reproductive and Sexual Health

MCRSH is a key to the long-term health of individuals, families, communities and societies. Reproductive and sexual health problems -- such as unintended pregnancies, maternal death, sexually transmitted diseases (STDs), gender-related violence and others -- are still the leading cause of illness and death for women of childbearing age worldwide. Although infant and childhood mortality is declining overall, some regions of the developing world still face significant burdens. The MCRSH concentration is designed to provide students with a theoretical understanding of the social and historical context that shapes maternal, child, reproductive and sexual behaviors and health outcomes across the life-span; and with practical experience in research, programs and/or policies to reduce disparities and promote health. Students in the MCRSH concentration will take three MCRSH specific courses: two required courses (PUBH 870 and PUBH 871) and one MCRSH-related elective (9 credits total). The MCRSH specific courses will replace the elective requirements of the Community, Society and Health track; students in the Epidemiology, Environmental and Occupational Health, and Health Policy and Management tracks may seek a concentration in MCRSH if they take these three required courses in addition to their track specific elective requirements. Students completing the MCRSH concentration are further required to have an MCRSH focus to their (1) PUBH 807 Practicum Project (3 credits) (2) PUBH 890 Advanced Research Seminar I (3 credits), (3) PUBH 891 Advanced Research Seminar II (3 credits), and (4) their second exam and (5) their dissertation (PUBH 898 Dissertation Seminar (0 credits) & PUBH 900 Dissertation Supervision (0 credits)). Thus the MCRSH concentration within the DPH will require that 18 of the 48 (or 57 for non CHS students) credits plus the second exam and the dissertation be focused on MCRSH, providing a solid foundation in this area.

PUBH 870 Maternal, Child, Reproductive and Sexual Health in Context (3 credits): A critical overview of public health issues, approaches and concerns in the area of Maternal, Child, Reproductive and Sexual Health. Topics will include the medicalization of maternity care and infancy/childhood; the consequences of 'risk' as a dominant ideology for Maternal, Child, Reproductive and Sexual Health care; issues in reproductive justice, with particular attention to race and class, and the historic and contemporary influence of eugenics in public health; the history of midwifery and global trends in midwifery care; and the role of public health interventions in infant care; sexual health and gender identity.

PUBH 871 Maternal, Child, Reproductive and Sexual Health: A Life Course Perspective (3 credits): Provides a theoretical framework as to how life course exposures affect vulnerability to disease, with an emphasis on the roles of maternal, child, reproductive and sexual health. This course also considers how intra- and inter-generational influences may be relevant to disparities in health. Readings will address empirical patterns, prevailing theories and controversies regarding life course influences, as well as addressing interventions or policies that may be applied to improve population health.

- *Prerequisite: PUBH 820*

First Examination Guidelines

Content
The First Exam is intended to assess students' mastery of the core courses and their preparedness to advance in the program. The exam assesses the capacity to synthesize material and apply knowledge from these required courses to analyze current public health issues and come to well-reasoned conclusions.

Requirements to Apply
Successful completion of courses listed below or their equivalent, or registered in the course at the time of application:
PUBH 800 Cities, Society, and Health
PUBH 801 Interdisciplinary Approaches to Urban Health Research
PUBH 805 Quantitative Research Methods with Applications to Urban Health (PUBH 824 for EPI students)
PUBH 806 Qualitative Research Methods with Application to Urban Health
PUBH 820 Epidemiologic Methods I

Examination Frequency and Timing
The First Exam is offered once per year two weeks before the start of the Fall semester.

Examination Format
The First Exam follows a take-home format, and includes questions based on peer-reviewed articles that are provided to the student at the start of the exam. The exam focuses on the application of key DPH competencies and critical analysis of public health issues in three public health domains: (1) Theoretical Frameworks; (2) Methodological Frameworks; and (3) Research Methods. Students write three essays in response to three questions (one from each of the above three domains). Responses are expected to demonstrate critical analysis skills, in depth understanding of public health theory, research methods, clear writing skills, and, at times, knowledge of specific content areas. Students are expected to draw on content from core courses, as summarized in a First Exam reading list provided. The student's understanding should be expressed in depth in a well written and organized answer in which selected relevant information is thoughtfully presented with appropriate citations from the literature. All assertions of fact are to be documented with references to published, peer-reviewed literature.

Process and Procedures
Students are responsible for ensuring that the Application for Eligibility for First Exam for the Doctor of Public Health Program is reviewed, approved and signed by their Advisor and Track Coordinator. The application due date will be announced the semester prior to when the exam is to take place. The application for the First Exam is on Blackboard.

While students may prepare for the exam with other students, they are required to work completely independently without any collaboration after the exam is distributed. Students may refer to relevant class notes and reference materials when writing the answers to the examination questions. Reading lists for the first exam are updated annually.

Students have two weeks to complete and submit the exam. The instructions for the exam will include due date and time and required formatting. Students must submit an electronic version by the due date and time and a hard copy signed statement of academic integrity should be mailed or hand delivered to the DPH Office and arrive within a week of the electronic due date. Once the exam is made available, all students approved to take the exam must submit a completed exam by the due date and time. Failure to submit the exam by the due date and time will result in a failing grade for the entire exam. Students must keep a record of their sent e-mail in the event that there are any questions regarding the timing of submission.

The DPH Curriculum and Examinations committee appoints a DPH First Exam Committee, which oversees and coordinates all aspects of the First Exam administration, from selecting readings to developing answer keys to grading. Members of this Committee will include representation from each DPH Track. All questions regarding a specific First Exam should be directed to the First Exam Committee Chair.

Assessment & Grading

Exams will be coded with a unique identifier for anonymous grading. A first reader (inside the student's track) and second reader (outside of the student's track) will be designated for each exam. The APO is the only person who knows the pairings of student exams to exam readers. Readers will independently read and grade the exam. Ratings will be based on how well the student demonstrates a capacity to apply knowledge and skills gained in the required coursework and synthesize information. Each question will be rated using the following scale

> Satisfactory – adequate understanding of and written communication about the subject matter.
>
> Unsatisfactory – fundamental misunderstanding or inadequate mastery of or poor written communication about key concepts or principles; inadequate responses to the questions being asked on the exam; additional work needed to meet program expectations.

Satisfactory Responses

Responses to a given question on the First Exam that meet the above criteria will be judged "Satisfactory." Please be aware that for each answer that meets this standard, detailed feedback will not be given to the student.

Unsatisfactory Responses

<u>"Unsatisfactory" response to only one question on the First Exam:</u>

Students with answers that receive an "Unsatisfactory" rating from both readers for one answer will be given the opportunity to rewrite it within a 2-week period. For answers to a given question that receive an "Unsatisfactory" rating from only one of the two readers on one answer, a third reader will be asked to rate that answer. If the third reader also judges the response to be unsatisfactory, the student will be given broad feedback on the problems with their responses, and the opportunity to rewrite that answer within a 2-week period. Students will be allowed only one chance to rewrite an answer to a question that received an "Unsatisfactory" rating. Failure to rewrite the answer within the given timeline or the receipt of an unsatisfactory grade on the rewrite will result in a failure of the exam. Students who fall into this category must work with their Track Coordinator or a designee to develop a plan for preparing for a one-time retake the entire First Exam the next time it is offered, which must be approved by Track Coordinator and Executive Officer within one month of the notice of the unsuccessful completion of the First Exam. Students must pass all questions in the re-take exam; students will not be allowed to re-write any question from a retake examination. Students are allowed to retake the exam only once and students who fail even one question on the retake or do not retake the exam at the next offering of the first exam will be asked to withdraw from the program.

<u>"Unsatisfactory" responses to more than one question on the First Exam :</u>

Students who are given an "Unsatisfactory" rating on two or three responses by both readers (or by the third reader in the event that the first two readers give discrepant grades) will be allowed one opportunity to retake the First Exam at the time of the next scheduled administration of the exam. Students who fall into this category must meet with their Track Coordinator or a designee to receive broad feedback regarding the problems with their responses. They must then work with their Track Coordinator or a designee to develop a plan for preparing to retake the First Exam, which must be approved by the Track Coordinator and Executive Officer within one month of the notice of the unsuccessful completion of the First Exam. Students must pass all questions in a re-take exam; students will not be allowed to re-write any question during a retake examination. Students are allowed to retake the exam only once and students who fail even one question on the retake or do not retake the exam at the next offering of the first exam will be asked to withdraw from the program.

Second Examination Guidelines

The Second Examination Guidelines section consists of:

- Second Exam Overview
- The Second Exam in Relation to Coursework, Registration, Timeframe
- The Second Exam Committee – Roles and Responsibilities
- Assessment of the Second Exam Applying for the Second Exam – Checkpoints
- Developing the Reading List and Writing the Second Exam – Checkpoints
- The Second Exam Defense– Checkpoints

Second Exam Overview

The Second Exam assesses the student's preparation and readiness to engage in dissertation research. It also further lays the groundwork for the student's dissertation research. The Second Exam has both a written and an oral component. It examines mastery of theory, evaluation of empirical evidence, and advanced methods relevant to the student's track and future dissertation research.

The Second Exam in Relation to Coursework, Registration, Timeframe

Students work on the Second Exam only after successfully completing the First Exam and all required and elective courses, with the exception of PUBH 891 Advanced Research Seminar II, PUBH 898 Dissertation Seminar, and PUBH 900 Dissertation Supervision. In order to take PUBH 891 Research Seminar II, students need to have defended the Second Exam or, by permission of the instructor, have the defense scheduled to occur within the first two weeks of the semester. Students must then successfully defend the Second Exam within the first two weeks of the semester in order to continue the course.

In order to stay active in the program while working on the Second Exam, students should register for Weighted Instructional Units (WIUs). See page 8 for details.

There are no established times for Second Exam approval or defense. The timing depends on the approval process, as well as the readiness of the student and the availability of committee members. It may be challenging to secure availability of committee members during the winter or summer breaks, and students should inquire about availability during those times, as well as upcoming sabbaticals, in advance and plan accordingly.

The Second Exam Committee – Roles and Responsibilities

The Second Exam committee consists of 3 members: Sponsor, Reader and Chair. Committee members must be approved by the Track Coordinator and the Executive Officer via the Second Exam application (found on Blackboard). All Second Exam Committee members must be members of the DPH Faculty. However, with adequate justification, requests for an exception may be made in writing to the Track Coordinator and Executive Officer.

Sponsor

The Sponsor (who may or may not be the student's Academic Advisor) is a DPH faculty member who works most closely with the student in preparing the Second Exam application and reading list and in developing a mature draft of the exam. The student and Sponsor discuss possible committee members, and these members are approached and invited to the committee by the Sponsor (not the student). The Sponsor works with the student to develop a working target date for the final submission of the written component of the exam. The Sponsor must approve the final readings list, and work closely with the student as s/he develops the written exam, approving the mature draft of the Second Exam before it is shared with t the Reader and Chair. Students should expect to work through a number of drafts before the written second exam is deemed ready for the oral defense. The Sponsor should be from the same Track as the student (unless otherwise requested by the student to the TC and approved by the EO) and serves as the primary liaison with the other committee members. If the Sponsor is not from the same Track as the Student, then the Reader must be, with no exceptions.

Reader

The preliminary reading list, developed by the Sponsor and Student, is submitted to the Reader who is a DPH faculty member and will provide feedback and approve the final reading list. The Reader and Chair are responsible for providing written feedback to the student on a mature draft (read and approved by the Sponsor) of the Second Exam. The Student works with the Sponsor to incorporate revisions accordingly, and the Sponsor approves a near final draft with revisions to be shared with the Reader and Chair. The Reader and Chair review the revised draft, provide feedback to the student as needed until they, together with the Sponsor, approve the revised Second Exam as 'defense-ready'. Once the Committee has approved the revised Second Exam as "defense ready", it is disseminated to the committee in its final format and a defense date scheduled. The timeline for the defense will allow 4 weeks for the committee to read the final version of the Second Exam prior to the defense. The Reader must be from the same Track as the student (unless otherwise requested by the TC and approved by the EO). If the Reader is not in the same track as the student, the Sponsor must be, with no exceptions. In rare instances the Reader may be from outside the DPH Program or CUNY, but this must be justified by the Sponsor and approved in advance by the Track Coordinator and Executive Officer.

Chair

The Chair is a DPH faculty member who schedules and runs the defense meeting, is responsible for ensuring that all procedures are properly followed, presides over deliberations regarding the final outcome, and communicates the final outcome of the defense to the APO, Track Coordinator, and Executive Officer. The Chair must approve the final reading list, and, along with the Reader, is responsible for providing written feedback to the student on a mature draft (read and approved by the Sponsor) of the written component of the Second Exam before the defense, and for reading the final version of the Second Exam prior to the defense.

Assessment of the Second Exam

Each committee member will rate the written and oral components based on the following:

Excellent – Clearly written, demonstrates mastery of subject matter, critical thinking abilities, concise synthesis and analysis of the literature. Ready to proceed to independent dissertation research.

Satisfactory – Clearly written, adequate understanding of subject matter and critical analysis and synthesis of the literature, with expectation that student will hone specific areas in order to be better prepared to commence independent dissertation research.

Unsatisfactory – Does not demonstrate understanding of subject matter and critical thinking abilities. Does not appear ready to commence independent dissertation research.

Applying for the Second Exam – Checkpoints

Student:

- Identify a Second Exam Sponsor by consulting with their Academic Advisor, tracking research activities of faculty working in areas of interest of the student, and meeting with faculty to explore possibilities for dissertation research.
- Discuss in detail the possibilities and work with the Sponsor to develop a draft, one page description of the planned dissertation research and Second Exam topic areas (see next bullet).
- Apply for the Second Exam by submitting a completed Application for Eligibility for Second Exam (found on Blackboard). Along with the application, students must submit a one page description of the planned dissertation background, topics/research questions, and methods (recognizing that these may be evolving) as well as a one page description about how the two topic/content areas and two methodological topics will feed into and support the planned dissertation research, to their Second Exam Sponsor.

Sponsor:

- Accepts the request to act as the Sponsor, and works closely with the student, serving as the primary liaison with the other committee members for the student's Second Exam.
- Approaches the Reader and Chair to invite them to act in those roles for student's Second Exam.
- Critically reviews and approves the student's Second Exam application and one page description.

Reader:

- Accepts Sponsor's request to act as the Reader for the Student's Second Exam.
- Critically reviews and approves the student's Second Exam application and one page description.

Chair:

- Accepts Sponsor's request to act as the Chair for the Student's Second Exam.
- Critically reviews and approves the student's Second Exam application and one page description.

Other:

- Track Coordinator reviews and approves the student's Second Exam application and one page description.
- Executive Officer reviews and approves the student's Second Exam application and one page description.

Developing the Reading List and Writing the Second Exam – Checkpoints

Student:

- Once the Second Exam application has been approved, the student has the primary responsibility for developing a preliminary reading list that covers two public health-related content areas and two relevant methodological areas that will support the proposed dissertation research. From the date the student's reading list is approved, it is expected that the Second Exam will take from 4 to 9 months to complete. If 9 months pass and no substantive progress has been made in completing the written portion of the exam, the student must submit another Application for Eligibility for Second Exam.
- The written component of the Second Exam comprises of a critical literature review of two substantive public health-related topic areas and two methodological topic areas relevant to the student's planned dissertation research. The exam should include a summary and analysis of the peer-reviewed literature and current state of knowledge in the particular area, a discussion of gaps in knowledge, and important areas for future research. When possible, the four topic areas should be related to each other (i.e. the discussion of the literature highlights a common methodological approach, or a methodological weakness or gap, which is then discussed in more detail in the methodological area potion of the exam that covers what the method is, its strengths and weaknesses, and how this method has been or could be applied to the topic areas). The Second Exam is intended to serve as a foundation for the dissertation proposal, but is often broader in scope than a specific dissertation topic and includes discussion of related theories and empirical evidence that sets a general context for the dissertation research area.
- The student revises the written component of the second exam to incorporate feedback from the Sponsor, and later the other committee members. Students should expect to work through a number of drafts with the Sponsor before the written exam is deemed ready to disseminate to other committee members.
- The penultimate draft and final version of the written component of the exam must be no more than 20 double-spaced pages, excluding references, figures, and tables.
- The student submits the Second Exam Progress report to the Sponsor every two months during this process.
- The Student works with the Sponsor by sharing detailed responses to committee member comments, and incorporate revisions accordingly. The Sponsor must approve a near final draft with revisions to be shared with the Reader and Chair for their comments.
- The Reader and Chair review the Sponsor-approved revised draft, and provide feedback to the student as needed until they and the sponsor approve the revised Second Exam as 'defense-ready'. Once the Reader has approved the revised Second Exam, it is disseminated to the committee as a whole and a defense date scheduled at least 4 weeks later.
- During the entire process, the student prepares for the oral defense, which can include questions from the approved reading list and any other reading list provided by the student's Track Coordinator (e.g., general readings for the discipline) at the time of Second Exam approval.
- The student prepares a 10-15 minute presentation for the Second Exam defense, and practices the presentation, ideally in front of others in a position to provide feedback, to ensure a clear, comprehensive, and concise delivery.
- The student informs the DPH Program of any special audiovisual needs beyond PowerPoint projection at least one week in advance of the defense
- The student brings hard copies of the slides for committee members on the day of the defense.

Sponsor:

- Works with the student on setting a realistic timeframe for completion of the exam.
- Reviews and submits bi-monthly Second Exam Progress reports to the TC and EO.
- Reviews, provides input on, and approves the Reading List, working drafts, and mature drafts of the Second Exam before sharing with Reader and Chair.
- Works with student to address comments of Sponsor, Reader, and Chair.

- Works with student to prepare the Second Exam Defense presentation.
- Critically reviews the final written portion of the Second Exam in advance of the defense, and comes to the defense with an initial rating of the written component (Excellent, Satisfactory, Unsatisfactory) along with supporting information and questions.

Reader:

- Provides feedback on and approves final Reading List.
- Provides written feedback on mature, sponsor-approved draft.
- Works with student to ensure comments of Sponsor, Reader and Chair are adequately addressed, ultimately approving a final draft as 'defense ready.'
- Critically reviews the final written portion of the Second Exam in advance of the defense, and comes to the defense with an initial rating of the written component (Excellent, Satisfactory, Unsatisfactory) along with supporting information and questions.

Chair:

- Approves the final Reading list.
- Provides written feedback on a mature draft.
- Critically reviews the final written portion of the Second Exam in advance of the defense, and comes to the defense with an initial rating of the written component (Excellent, Satisfactory, Unsatisfactory) along with supporting information and questions.
- Communicates with the committee about when the exam is ready for defense, schedules the defense data for no less than 4 weeks following receipt of the final revised document and requests a room for the defense from the APO.

Other:

- At the time of the Second Exam application approval, the Track Coordinators may supplement the student's reading list with the intention to guide the student in theory and methods.
- The APO will schedule a room with standard A/V equipment.

The Second Exam Defense– Checkpoints

Student:
The student is responsible for both the written content of the Second Exam as well as any material included on general supplemental readings that may be provided by each Track.

Sponsor:

- The Sponsor has worked closely with the student on the entire Second Exam.
- Critically reviews the final proposal in advance of the defense, and comes to the defense prepared with comments and questions.

Reader:

- The Reader has given feedback on and approved the Reading List, provided feedback on mature drafts and ensured the final version is 'defense ready'.
- Critically reviews the final proposal in advance of the defense, and comes to the defense prepared with comments and questions.

Chair:

- The Chair has approved the Reading List, provided feedback on a mature draft and ensured the final version is 'defense ready'. The Chair communicates with the committee and when all agree that the written exam is defense ready, s/he schedules the defense date (at least 4 weeks after the student has submitted the final, committee approved draft) and requests a room from the APO.
- Critically reviews the final proposal in advance of the defense, and comes to the defense prepared with comments and questions.
- The Chair presides over the Second Exam Defense and reports the outcome to the student and the DPH Program (TC, EO and APO).

Second Exam Defense Process

1. The defense should last approximately 2 hours.

2. All committee members and the student are expected to arrive on time, turn off mobile devices, and remain in the room for the duration of the defense.

3. Immediately prior to the defense, the Committee will convene briefly and the Chair will check if there are any outstanding issues, describe the defense process and assign the order of the questioning. The Sponsor has the option of choosing to be the first or last questioner.

4. The student makes a brief summary presentation (s/he may present slides if helpful). Since all committee members will be intimately familiar with the content of exam by this point, this presentation should be 10-15 minutes in length, and in no cases should it be more than 20 minutes.

5. All committee members should be given the opportunity to pose questions to the student on the content of the written exam as well as general theory and methods questions related to the student's disciplinary Track.

6. The student responds to questions posed by the committee members.

7. Immediately following the presentation, questions and discussion, the Chair asks the student to step out of the room and the committee members come to a consensus on an overall grade of *excellent*, *satisfactory* or *unsatisfactory*, which is based on each faculty member's initial critical review of the written component and the student's oral defense. In the event that a student receives a grade of unsatisfactory on the exam, an ad hoc faculty committee will be formed by the EO to discuss the student's continuation in the program. This committee may decide to require that the student take additional coursework or complete other work before retaking the Second Exam, or the committee may request that the student withdraw from the Program. Students may be allowed to retake the Second Exam only once. If they do not pass the retake of the Second Exam, the student will be asked to withdraw from the Program.

8. The Chair reports to the outcome of the Second Exam defense to the student, the TC, the EO, and the APO.

Dissertation Guidelines

The Dissertation Guidelines section consists of:

- The Dissertation in Relation to Coursework, The Second Exam, Registration, Levels, and Records
- The Dissertation Committee – Roles and Responsibilities
- Preparation of the Dissertation Proposal - Checkpoints
- Dissertation Proposal Defense - Process
- Guidance on the Three Article Dissertation Model
- Guidance on the Traditional Dissertation Model
- Dissertation Review, Approval, and Preparation for the Defense - Checkpoints
- Dissertation Defense – Checkpoints
- Dissertation Defense - Process

After completing all coursework and exams, students complete an original dissertation research project.

The Dissertation in Relation to Coursework, The Second Exam, Registration, Levels, and Records
Within the first year of coursework, students should discuss possible dissertation topics and research questions with their advisor and other faculty members. By the end of the first year of coursework, students should have possible research topics and research questions identified. And by the end of PUBH 890 Advanced Research Seminar I, students should have made substantial progress toward identifying a topic, research questions, possible methods, and source of data for the dissertation (i.e. planned self-collection, a publicly available data source, or data from the research study already conducted by the student, a faculty member, student's workplace, or some other source). In identifying potential data for the dissertation, students might consider some of the publicly available data sources which are included on a list posted on BlackBoard.

Once an area and initial research questions are selected, students should determine if the appropriate data can be acquired and if s/he has the requisite research skills to analyze the data correctly or can gain the expertise to do so. As each student's dissertation is unique, it is not possible for the required Program coursework to cover every research method that might be used for a dissertation and students are expected to plan their elective courses, independent studies, and even include additional coursework or training aimed at preparing themselves for their independent dissertation research and associated analytic techniques they are planning to employ in order to successfully complete the dissertation.

In PUBH 891 Advanced Research Seminar II students will refine the dissertation proposal. Students are required to complete and submit the annual Dissertation Progress Report annually (with review and approval by the sponsor) by the second week of the spring semester of each year until the dissertation is successfully defended and deposited.

Students must complete all coursework, pass the First and Second Exams, identify a Dissertation Sponsor, and convene a dissertation committee approved by the Track Coordinator before registering for PUBH 900 Dissertation Supervision and PUBH 898 Dissertation Seminar. PUBH 900 Dissertation Supervision and PUBH 898 Dissertation Seminar are non-credit required course numbers that students must be registered for every semester they are working on the dissertation. The student must be registered for PUBH 900 and PUBH 898 in the same or preceding semester that the student deposits the dissertation.

Students can only be advanced to Level III after the completion of all coursework, passing the First and Second Exams, and defending their dissertation proposal. See page 7.

The name of the student as noted on the dissertation to be deposited must match that of the name in Banner. If a student wishes to change name of record with the GC, they should request a change of name form from the Registrar's Office and submit that along with supporting documentation well in advance of the defense and dissertation deposit dates.

Upon depositing the dissertation, the student must show evidence that their record has been cleared by the Bursar, the Registrar, the Office of Financial Aid, the Director of the Office of International Students (if applicable), and the Mina Rees Library at the Graduate Center.

The Dissertation Committee – Roles and Responsibilities

The Dissertation Committee consists of four to five people: Sponsor, First Reader, Chair, Outside Reader, and an optional Third Reader. The roles must each be held by a different person (one person cannot fill more than one role on the committee). In no circumstances shall both the Sponsor and the First Reader be from outside the student's Track. The Track Coordinator, in consultation with the Executive Officer, makes the final decision on all committee member appointments and changes.

The members of the dissertation committee usually serve from the proposal stage through the dissertation defense. In situations when changes need to occur, the Sponsor must request and the TC and EO must approve any replacement committee members.

Sponsor

The Sponsor is a DPH faculty member who has prior experience serving on dissertation committees, expertise in the student's interest area and must be from the same disciplinary Track as the student. The student must negotiate a dissertation research project that the Sponsor agrees to supervise. The Sponsor is the faculty member who works most closely with and mentors the student to guide research content, study design and conduct, data analysis, writing, interpretation of results, and help to foresee and solve problems. When a student registers for PUBH 900 Dissertation Supervision, they do so under their Sponsor's name. The Sponsor will identify and recruit other dissertation committee members, usually in consultation with the student. The Sponsor is responsible for providing feedback on early drafts of the proposal and dissertation, approving the draft that is provided to the First Reader. The Sponsor also works with the Student to manage any revisions to the dissertation proposal and the dissertation itself requested by other committee members. The Sponsor cannot be on sabbatical while sponsoring a student. In this instance, an appropriate 'back-up' Sponsor must be identified well in advance and submitted by the Sponsor for approval by the TC and EO. The sponsor may continue to advise the student in an unofficial capacity or officially by taking-on a different role in the committee (e.g. the sponsor and another committee member may switch roles during the sabbatical).

First Reader

The First Reader is a DPH faculty member who must be from the same disciplinary Track as the student. S/he often reads several mature drafts of the proposal and dissertation, providing comments on the aims, design, and analytic approaches, The First Reader must read and provide thorough feedback on the first full Sponsor-approved draft of the proposal and dissertation in addition to the final versions but may provide comments on drafts between these two versions as well if needed. The First Reader, in consultation with the Sponsor, must approve the dissertation proposal and dissertation as 'Defense Ready' prior to circulating it to other committee members.

Chair
The Chair is a senior member of the DPH faculty (professor or associate professor) with experience in dissertation committee membership and student sponsorship, and is from the same Track as the student. The Chair will read and give feedback on Sponsor and First Reader approved drafts of the dissertation proposal and the dissertation at least once prior to each defense. He or she also oversees the process, convenes meetings, including the defense itself, and works to resolve any differences that might arise in the committee. The Chair presides over the dissertation proposal defense and dissertation defense, and reports on the outcome of the defense to the APO, Track Coordinator, and Executive Officer.

Outside (Second) Reader
The Outside Reader cannot be a DPH program faculty member. The outside reader may be a faculty member appointed to any other CUNY program, University, or from a professional organization or agency. The Outside Reader will provide specific expertise and quality control and will review the Sponsor and First Reader approved drafts of the proposal and dissertation and provide at least one round of feedback before the defense is scheduled. All outside readers must have demonstrated training, experience, and capability of rigorously evaluating research in the student's discipline. A CV of the outside member must be reviewed by the Sponsor and approved by the Track Coordinator and EO prior to their committee appointment.

Optional (Third) Reader
The optional Fifth Member can be either a DPH faculty member or from outside the DPH program or CUNY. The optional Third Reader will provide specific expertise and quality control and will review the Sponsor and First Reader approved drafts of the proposal and dissertation and provide at least one round of feedback before the defense is scheduled. Prior to the committee appointment, rationale for the appointment of a Third Reader must be provided to the TC and EO, along with a recent CV.

Preparation of the Dissertation Proposal - Checkpoints

Overview:

1) The Student works closely with the Sponsor to develop a comprehensive and polished draft of the dissertation proposal.
2) With the Sponsor approval, this draft is then shared with the First Reader who provides feedback and works with the student in consultation with the Sponsor to ensure that any additional comments are addressed.
3) Then, with First Reader approval, the proposal is circulated to the entire committee by the student and the committee is given 4 weeks within which they must provide written feedback to the student.
4) The Chair contacts the committee members to see if there is agreement that the proposal is ready for defense, if not, the student addresses comments and circulates the next draft to the entire committee (until the committee agrees it is ready for defense). Once the committee agree the proposal is ready for defense,
5) the Chair schedules the defense.

There are no established times for the dissertation proposal defense. The timing depends on the readiness of the student and the availability of committee members. It may be challenging to secure availability of committee members during the winter or summer breaks, and students should inquire about availability during those times, as well as upcoming sabbaticals, in advance and plan accordingly.

Roles of the Student, Sponsor, and other Dissertation Committee members

Student:

- Prior to finalizing the proposal, the student must complete the online CUNY's Responsible Conduct of Research (RCR) training . This is not mandatory for soon to deposit/defend candidates, however newer cohorts should anticipate having to complete this training as part of PUBH 891 Advanced Research Methods II.
  http://www.cuny.edu/research/compliance/Responsible-Conduct-of-Research.html
- After the proposal defense, the student completes, signs and submits GC Human Participants Clearance Form, dissertation abstract, and IRB approval or exemption to Nichol Gallimore at ngallimore@gc.cuny.edu.
  All questions regarding the GC Human Participants Clearance Form should be directed to Nichol Gallimore.
  http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Research%20Funding/dissertation-form-letter_v2_1.pdf
  Please also review The CUNY Human Research Protection Program (HRPP) which comprises of 5 University Integrated Institutional Review Boards (IRBs) and 19 on-site HRPP offices.
  http://www.cuny.edu/research/compliance/human-subjects-research-1.html
- The student updates, submits and reviews the annual Dissertation Progress Report (found on Blackboard) with the Sponsor. The report must be approved by the Sponsor and submitted to the Track Coordinator by the second week of each spring semester until the dissertation is deposited.
- The Student prepares drafts of the dissertation proposal in the NIH format (see below) and shares with the Sponsor for review, input/feedback, and discussion.
- The Student may consult with other committee members regarding aspects of the proposal as it is under development.
- A mature, Sponsor-approved, full draft of the proposal is shared with the First Reader for review, input/feedback, and discussion. The student allows at least 4 weeks for review.

- The Student works with the Sponsor and First Reader to incorporate comments, suggestions, and feedback into a mature draft until it is approved by the First Reader, in consultation with the Sponsor.
- The First-Reader approved draft is then circulated to the entire committee for their review, input/feedback, and discussion. The student allows at least 4 weeks for review.
- All comments are shared with the Sponsor and First Reader for review and discussion. The student prepares responses to all major comments and reviews them with the Sponsor and First Reader.
- Additional revisions may be necessary, and the Sponsor and/or First Reader may recommend that the full committee review additional drafts. The Sponsor and First Reader work with the Student to revise the proposal accordingly.
- The Student must ensure that the proposal adheres to content and format guidelines below, including font size, line spacing, and page limits.
- Once the committee, approves the revised proposal (communicated to the Chair) as 'defense ready', the final proposal may be circulated to the full committee and a proposal defense date scheduled, allowing at least 4 weeks for review and identifying a day/time when all committee members can be present. The student prepares a 10-15 minute presentation for the Dissertation Proposal Defense, and practices the presentation, ideally in front of others in a position to provide feedback, to ensure a clear, comprehensive, and concise delivery.
- The student informs the DPH Program's APO of any special audiovisual needs beyond PowerPoint projection at least two weeks in advance of the defense.
- The student brings hard copies of the slides for committee members on the day of the defense.

Sponsor:

- Meet with the student regularly, review and provide input and guidance on all aspects of proposal development.
- Provide written feedback on all drafts of the proposal. Note that it is common for the proposal to go through multiple drafts before the Sponsor approves circulation of a full and mature draft to the First Reader.
- Review and ensure that the comments and revisions from all committee members are received and adequately considered and addressed as appropriate by the student.
- Approve mature draft of proposal for sharing with the First Reader.
- Consult with the First Reader on Student's proposal development progress and readiness to circulate to other committee members as needed.
- Critically review the final proposal in advance of the defense, and come to the defense prepared with comments and questions.

First Reader:

- Provide written feedback on full, mature, Sponsor-approved drafts of the proposal. Note that it is common for the proposal to go through multiple revisions before the First Reader approves circulation to the larger Dissertation Committee.
- Consult with the Sponsor on Student's proposal development progress and readiness to circulate to other committee members as needed.
- Critically review the final proposal in advance of the defense, and come to the defense prepared with comments and questions.

Chair:

- Provide written feedback on a mature, First-Reader approved draft.
- Communicates with committee members to determine when the proposal is ready for defense and a defense date can be scheduled.
- Schedules the defense, communicates with the APO to identify a room for the defense, and notifies the committee and student of the date and location for the defense.

- The Chair works with the Student and/or Committee Members as needed to resolve outstanding issues that cannot be resolved by the Student and the Sponsor or other committee members.
- Critically review the final proposal in advance of the defense, and come to the defense prepared with comments and questions.
- The Chair presides over the proposal defense and reports the outcome to the TC, EO and APO.

Outside (Second) Reader(s):

- The Outside Reader (and optional Third Reader) provide specific expertise and quality control.
- Provides written feedback on a mature, First-Reader approved draft. Critically review the final proposal in advance of the defense, and come to the defense prepared with comments and questions.

APO

- The APO will schedule a room with standard A/V equipment upon request from the Chair and student.

Dissertation Proposal Format

The dissertation proposal is a detailed plan that describes the content and methods of the planned dissertation. It is to be prepared in the NIH proposal format (below) and will include a statement of the problem, aims and research questions, a brief summary of relevant literature that explains the background and significance of the topic and describes the gaps that will be addressed by the dissertation, describes in some detail the study design, data sources, methods of data collection, and data analysis methods. Students are expected to describe and explain the theoretical framework for the study and include a power or sample size calculation for all quantitative analyses. The methods proposed should be both rigorous and feasible as it relates to achieving the aims and answering the proposed research questions as definitively as possible without major limitations that undermine or threaten the validity of the proposed research. The proposal should include a thorough description of the strengths and limitations of the proposed approach and a realistic timetable for completing the dissertation. It must also address human subjects issues related to your proposed research.

Elements of a Dissertation Proposal in the NIH format
Students should use the full 13 pages for their dissertation proposal, but no more than 13 pages.

1. Specific aims (1 page, single spaced)

2. Research Plan (12 pages, single spaced not including Human Subjects, citations and appendices)

    2.a. Background and significance, with 1 paragraph conclusion (no more than 2 pages)
    2.b. Innovation (about half a page)
    2.c. Approach (about 9.5 pages)

        2.c.1. Conceptual/Theoretical Framework w/ diagram (about 1 page)
        2.c.2. Preliminary data (if applicable, no more than half a page)
        2.c.3. Research design (6-7 pages, must address all proposal aims)
        2.c.3.1. Study design
        2.c.3.2. Study population and eligibility criteria (about 1-2 paragraphs)
        2.c.3.3. Data sources, collection, and management (about 1 page)
        2.c.3.4. Sampling/Recruitment procedures (if applicable)
        2.c.3.5. Primary and secondary outcome definitions
        2.c.3.6. Data analysis plan for each proposal Aim (i.e., statistical analysis/modeling or qualitative analysis)
        2.c.3.7. Statistical power and sample size for each Aim (if applicable, no more than half a page)

    2.d. Study timeline (1 paragraph or table)
    2.e. Generalizability (1 paragraph)
    2.f. Limitations and threats to the validity of the proposed research and how they will be managed (1 page)

3. Human Subjects (no page limit). For instructions, review Part II of NIH's Supplemental Instructions for Preparing the Protection of Human Subjects Section of the Research Plan.

4. Citations

5. Appendices (may include draft data collection instruments)

Dissertation Proposal Defense Process

1. The proposal defense should last approximately 2 hours.

2. All committee members and the student are expected to arrive on time, turn off mobile devices, and remain in the room for the duration of the defense.

3. Immediately prior to the defense, the Committee will convene briefly and the Chair will check if there are any outstanding issues, describe the defense process and assign the order of the questioning. The Sponsor has the option of choosing to be the first or last questioner.

4. Once the Committee and Student are assembled, the student gives a 10-15 minute formal presentation of the proposal (slides may be presented if desired). Since all committee members will be intimately familiar with the content of the proposal by this point, this presentation should be 10-15 minutes in length, and in no cases should it be more than 20 minutes.

5. Each committee member will ask questions and give feedback for approximately 15-20 minutes each.

6. The Chair will facilitate a discussion of the proposal.

7. Immediately following the presentation and discussion, the Chair asks the student to step out of the room and the committee members come to a consensus on the outcome of the proposal defense. The possible outcomes are: 1. Pass with no or minor revisions; 2. Pass with major revisions; 3. Failed. In the event of minor revisions, only the Sponsor must approve the revised dissertation proposal. In the event that major revisions are required, both the Sponsor and the First Reader must approve the revised dissertation proposal. In the event of a failed dissertation proposal defense, an ad hoc faculty committee will be formed by the TC and EO to develop a course of action.

8. The Chair will report the outcome of the proposal defense to the Track Coordinator, APO, and EO.

9. Final approved dissertation proposals must be submitted to the DPH Program office in PDF format by the Student for archival purposes.

Dissertation Preparation, Review, Approval, and the Dissertation Defense Process - Checkpoints

Overview:

1) The Student works closely with the Sponsor to develop comprehensive and polished drafts of individual dissertation chapters or manuscripts.
2) With the Sponsor's approval, draft chapters or manuscripts are then shared with the First Reader who provides feedback and works with the student in consultation with the Sponsor to ensure that any additional comments are addressed.
3) Then, with First Reader approval, individual dissertation chapters are circulated to the entire committee by the Student and the committee is given at least 3 weeks within which they must provide written feedback to the student on individual dissertation chapters.
4) The Student reviews comments with the Sponsor and incorporates revisions accordingly.
5) Revised, individual chapters are approved as 'Defense-ready' by the committee and communicated to the Chair (who notifies the Sponsor).
6) The Final Dissertation with all chapters is reviewed by the Sponsor and First Reader, and approved by both prior to circulation to the full committee, allowing 4 weeks for review and feedback.
7) Comments from the full committee are addressed, in consultation with the Sponsor and First Reader and upon approval by the Sponsor and First Reader, the Final Full Dissertation is disseminated to the full committee and a defense date is scheduled, allowing at least 4 weeks before the defense to allow time for all committee members to review the dissertation in its entirety.

There are no established times for the dissertation defense. The timing depends on the readiness of the student and the availability of committee members. It may be challenging to secure availability of committee members during the winter or summer breaks, and students should inquire about availability during those times, as well as upcoming sabbaticals, in advance and plan accordingly.

Student:

- The student updates, submits and reviews the annual Dissertation Progress Report (found on Blackboard) with the Sponsor. The report must be approved by the Sponsor and submitted to the Track Coordinator by the second week of each spring semester until the dissertation is deposited.
- The Student, in consultation with the Sponsor, chooses a dissertation format (3 paper model or traditional dissertation).
- The Student prepares drafts of individual dissertation chapters and shares with the sponsor for review, input/feedback, and discussion.
- The Student may consult with other committee members regarding aspects of the dissertation as it is under development.
- Mature, Sponsor-approved, full draft of individual chapters are shared with the First Reader for review, input/feedback, and discussion. The student allows at least 3 weeks for review of each chapter.
- The Student works with the Sponsor and First Reader to incorporate comments, suggestions, and feedback into a mature drafts of individual chapters that are approved by the First Reader, in consultation with the Sponsor.
- The First-Reader approved drafts of individual chapters are then circulated to the entire committee for their review, input/feedback, and discussion. The student allows at least 3 weeks for review.
- All comments are shared with the Sponsor and First Reader for review and discussion. The student prepares responses to all major comments and reviews them with the Sponsor and First Reader.
- The Student works with the Sponsor to address and incorporate all comments. A mature, Sponsor-Approved revised draft of each chapter is provided to the First Reader for their review, input/feedback,

discussion, and assessment of responsiveness to the committee's comment. The student allows at least 3 weeks for review.

- Additional revisions may be necessary, and the Sponsor and/or First Reader may recommend that the full committee review additional drafts of individual chapters. The Sponsor and First Reader work with the Student to revise the chapters accordingly.
- Once the committee has approved the individual chapters as defense ready (communicated to the Chair who informs the Sponsor), a full dissertation is developed with all chapters included for review by the Sponsor. This draft has incorporated and/or addressed all comments received by all committee members to date. The student incorporates final comments and edits from the Sponsor. A Sponsor-approved, full dissertation is then shared with the First Reader, allowing at least 4 weeks for review.
- Prior to circulating the full dissertation to the First Reader, the Student must ensure that the dissertation adheres to all content and format guidelines.
- Once the First Reader, in consultation with the Sponsor, approves the full dissertation as 'defense ready', the penultimate version of the full dissertation may be circulated to the full committee, allowing at least 4 weeks for review.
- Comments from the full committee are reviewed and incorporated by the student, in consultation with the Sponsor and First Reader. Once the Sponsor and First Reader determine that the feedback has been adequately addressed/incorporated by the student in a Final Full Dissertation, it may be circulated to the full committee, allowing at least four weeks for review prior to the scheduled defense date.
- The student prepares a 10-15 minute presentation for the Dissertation Defense, and practices the presentation, ideally in front of others in a position to provide feedback, to ensure a clear, comprehensive, and concise delivery.
- The student informs the DPH Program's APO of any special audiovisual needs beyond PowerPoint projection at least two weeks in advance of the defense.
- The student brings hard copies of the slides for committee members on the day of the defense.

Sponsor:

- Meet with the student regularly, review and provide input and guidance on all aspects of dissertation development.
- Provide written feedback on all drafts of dissertation chapters and the full dissertation. Note that it is common for dissertation chapters to go through multiple drafts before the sponsor approves circulation of a full and mature draft to the First Reader.
- Review and ensure that the comments and revisions to dissertation chapters from all committee members are received and adequately considered and addressed as appropriate by the student.
- Approve mature drafts before sharing with First Reader.
- Consult with the First Reader on Student's dissertation progress and readiness to circulate to other committee members as needed.
- Consult with the Chair on the readiness of the dissertation chapters for combining into the full dissertation.
- Work with the student to prepare the full dissertation, providing comments and feedback, and approve it for review by the First Reader.
- Work with the student to ensure committee comments on the full dissertation have been addressed.
- Critically review the final, full dissertation in advance of circulation for the defense, and come to the defense prepared with comments and questions.

First Reader:

- Provide written feedback on full, mature, Sponsor-approved drafts of individual dissertation chapters as well as the full dissertation. Note that it is common for dissertation chapters to go through multiple revisions before the First Reader approves circulation to the larger Dissertation Committee.
- Consult with the Sponsor on Student's dissertation progress and readiness to circulate chapters to other committee members as needed.
- The First Reader must approve the Final Full Dissertation as Defense-ready prior to scheduling the Dissertation Defense.
- Critically review the final dissertation in advance of the defense, and come to the defense prepared with comments and questions.

Chair:

- Provides written feedback on a mature First-Reader approved drafts of individual chapters as well as the full dissertation.
- The Chair works with the Student and/or Committee Members as needed to resolve outstanding issues that cannot be resolved by the Student and the Sponsor or other committee members.
- Communicate with committee members about their views on whether drafts of chapters and the first draft of the full dissertation will be ready for defense once comments have been addressed (or if the committee wants to see additional drafts).
- At least a month in advance of the defense , the Chair schedules the dissertation defense, requests a room for the defense from the APO, and communicates the date and location of the defense to the committee and student.
- At least a month in advance of the defense, the Chair provides the following to the APO with (1) Name of the student; (2) Title of dissertation; (3) Date, time, and place of the defense; and (4) Names of committee members, their affiliation, and email addresses to which invitations are to be sent.
- Critically review the final, full dissertation in advance of the defense, and come to the defense prepared with comments and questions.
- The Chair presides over the dissertation defense and reports the outcome to the TC, EO and APO.

Outside (Second) Reader(s):

- The Outside Reader (and optional Third Reader) provide specific expertise and quality control.
- The Outside Reader (and optional Third Reader) provide critical review and feedback on First Reader approved drafts of individual dissertation chapters as well as on the First Reader approved full dissertation draft.
- The Outside Reader (and optional Third Reader) will provide a critical review on the final, full dissertation, and come to the dissertation defense with prepared comments and questions.

Guidance on the Three Article Dissertation Model

Overview

This guidance is intended for students who choose to pursue a three article dissertation model. Students, sponsors, and other faculty serving on the dissertation committee should refer to this guidance in deciding whether the three article model would be appropriate for a given dissertation project, and subsequently when the dissertation is being written. This model is an option for DPH students and does not replace the current traditional dissertation model that has been used in the past and which remains as the alternate option. Some dissertation projects fit well under the three article model, and others are better written up in the traditional format. The choice of which model to work under for a given dissertation research project should be based on a discussion between the student and their sponsor, and the amount and complexity of the new research required for a dissertation would be similar no matter which format is chosen.

The DPH dissertation that conforms to the three article model comprises three separate papers (articles) of normal, discipline-specific, journal length that would be considered a 'publishable' research manuscript in a peer reviewed scientific or professional journal. The independence of the three papers reflects the fact that the articles may be read and understood without reference to one another; nevertheless, the papers must support an overarching research theme as outlined in the dissertation proposal. In addition, an overall introduction and conclusion to the dissertation in which the topics addressed in the three articles and, for the conclusion, their findings are synthesized together to provide an overall picture of the implications of the research to the field.

Format

The three papers are preceded in the dissertation document by an abstract and an introductory chapter, and are followed by a concluding chapter. Thus, the form of the 3-paper DPH Dissertation is as follows:

- Title page
- Abstract (for the overall dissertation)
- Table of contents
- List of Tables and Figures
- Acknowledgements and dedications
- Chapter 1: Introduction and background to the general topic area and gaps to be filled by the three articles.
    - Include the dissertation specific aims and hypotheses
- Chapter 2: First paper
- Chapter 3: Second paper
- Chapter 4: Third paper
- Chapter 5: Summary of results, conclusions and implications for policy and/or further research
    - Key Strengths and Limitations
    - Public Health Relevance
- Appendices

Specific Guidelines for the 3-paper DPH Dissertation

1. The introductory chapter provides an overview of the dissertation. It introduces the research theme and conceptual basis; establishes the public health importance of the problem under study; states the primary research questions and hypotheses; introduces methodological approaches; highlights and contextualizes salient literature; and briefly describes policy and programmatic implications. The specific aims and hypotheses of the dissertation must be included in this chapter.

2. The three papers must represent work that was initiated while the student was enrolled in the DPH program and approved by the student's entire dissertation committee at the dissertation proposal defense or officially in writing thereafter. The inclusion of research that was undertaken prior to defense of the dissertation proposal is permissible, however only with explicit committee approval prior to the dissertation proposal defense. As with the conventional dissertation model, all work must be independently conducted by the student.

3. The three papers must conform to the format of a typical scientific journal in the student's field of study, and be of normal length (3000-5000 words, depending on the target journal).For each of the three papers that are part of a student's dissertation, there will be a separate abstract. The three papers in the dissertation will likely include more in the way of methods and results than can fit into or is appropriate for a scientific journal article of normal length. Additional methodological detail, analyses or results synthesis conducted by the student or required by the committee (e.g., additional methodological detail, tables, figures, summaries, sub analyses, sensitivity analyses etc.) that is necessary for the dissertation, but not appropriate or too detailed for a journal article of normal length, should be included in the dissertation as appendices.

4. At least two of the three articles must be based on student analysis of data, either quantitative, qualitative, or mixed methods. A conceptual, theoretical, or methodological article is acceptable as a third paper, but must be closely aligned with the overall theme of the dissertation, and publishable, as judged by the dissertation committee. A literature review or synthesis is not acceptable for the third paper, as relevant literature should be critically appraised within the data analytic papers. However, systematic reviews and meta analyses are permissible.

5. "Publishability" of the articles is determined by the student's dissertation committee, which serves in the capacity of unofficial editorial board for the student. But in general, the committee should judge 'publishability' against the standard of leading peer reviewed scientific journals in the student's field of study.

6. Neither publication nor submission of the three articles is a requirement for completion of the DPH degree. Students may, however, submit committee-approved dissertation 'articles' to refereed scientific journals, even before the final dissertation defense, as external reviewer feedback will enhance quality and learning. In such cases, students should report feedback from peer reviewers to the sponsor and perhaps other committee members, and consult with them on incorporation of suggested modifications to the dissertation. A manuscript's acceptance for publication does not preclude committee members from requiring additional modifications to the manuscript for inclusion in the final dissertation.

7. The concluding chapter establishes the individual and collective contribution of the three articles to the student's area of inquiry. It discusses future research opportunities arising from the dissertation's development of the topic; It also details the public health relevance of findings (e.g., in terms of health policy, programs, practice or interventions). Finally, a critical discussion of key strengths and limitations of the research as it relates to the main findings across the three manuscripts must be included.

8. Authorship
    a. Independence: As with the conventional dissertation model, the DPH dissertation must be substantially the student's own work, and must be judged as such by the dissertation committee/examiners. However, once this has been established, in some cases it may be appropriate to include the dissertation sponsor and other dissertation committee members as co-authors on manuscripts being submitted to professional and scientific journals.
    b. The responsibilities of the first author: The student shall assume the role of first author on dissertation chapters submitted for publication. The responsibilities assumed of first author typically include: synthesis of the relevant literature, development of the major thesis, research question(s) and hypotheses; selection of an appropriate research design; development or adaptation of a conceptual model or framework; study design and data collection (where applicable); data management, analysis, and interpretation of results; preparation of major parts of manuscripts.
    c. Co-authorship: In no cases should authorship be expected or assumed by dissertation committee members. Students may invite dissertation committee members—or external mentors—to co-author a given paper from their dissertation, but the student must assume the role of "first author" on all articles. To be considered a co-author on a manuscript submitted for publication, faculty co-authors must contribute sufficiently to warrant co-authorship. Judgment of the potential contribution of co-authors can also be made by the student in consultation with the dissertation Sponsor, another committee member, or someone external to the dissertation committee. It is suggested that student use recommendations, such as those from the International Committee of Medical Journal Editors, as a guide to make determinations about authorship: (see http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html), which recommends that authorship be based on the following 4 criteria:
        - Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
        - Drafting the work or revising it critically for important intellectual content; AND
        - Final approval of the version to be published; AND
        - Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

      Dissertation committee members or external reviewers who may be appointed by the DPH Program at some time in the future to serve as 'examiners' for the purposes of quality control cannot serve as co-authors, but should be thought of more as 'peer reviewers'.

9. This guidance was first issued by the DPH Program in June 2014 and again revised for the 2015 Program Manual. It will be included in the student manual and updated annually and as the program accrues experience with the three article model. Students and committees are expected to adhere to the most recent guidance from the DPH Program, regardless of when the student's dissertation research began.

Guidance on the Traditional Dissertation Model

Overview

This guidance is intended for students who choose to pursue a traditional (book format) dissertation model. Students, sponsors, and other faculty serving on the dissertation committee should refer to this guidance in deciding whether the traditional dissertation model would be appropriate for a given dissertation project, and subsequently when the dissertation is being written. This model is the format that has been used in the past and remains as an alternate option for DPH students who do not choose the three article format. Some dissertation projects fit well under the traditional model and others may be better suited to the three article model. The choice of which model to work under for a given dissertation research project should be based on a discussion between the student and their sponsor, and the amount and complexity of the new research required for a dissertation would be similar no matter which format is chosen.

The DPH dissertation that conforms to the traditional model comprises multiple chapters together in a book format. Unlike the three separate article format, the literature review, methods and conclusions will be presented all together each in its own, single chapter (rather than repeated at the beginning of each of the three articles). The results will also be presented together in one, or if more appropriate, a few chapters. In addition, an overall introduction and conclusion to the dissertation will be included in which the topics addressed in chapters are synthesized together to provide an overall picture of the implications of the research to the field.

Format

The traditional dissertation is organized into sections. Each section may be a single chapter or may include a few chapters, depending on the amount of information being presented and the optimal organization of that information. It is likely that the results section will include more than one chapter as the quantity of analysis required for this dissertation format is similar to that of the three article format. Thus, the form of the Traditional DPH Dissertation is as follows:

- Title page
- Abstract for the overall dissertation
- Table of contents
- List of Tables and Figures
- Acknowledgements and dedications
- Section 1: Introduction and background to the general topic area and gaps to be filled
    - Include the dissertation aims and hypotheses
- Section 2: Literature Review
- Section3: Methodology
- Section 4: Results & Interpretation
- Section 5: Conclusions, Discussion and Evaluation
- Appendices

Specific Guidelines for the DPH Traditional Dissertation

The dissertation must be based on student analysis of data, either quantitative, qualitative, or mixed methods. It may include a conceptual, theoretical, or methodological section as well. A systematic review or meta analyses may be included as part of the dissertation, but is not, in itself, sufficient and additional data analysis is required. Below is a brief description of what to include within each section of a dissertation written in the traditional format.

Section 1. Introduction

This section should introduce the aims of the study, including its justification within the field and its significance, both to the track and to public health overall. As well, this section should present the dissertation aims, guiding research question(s) and hypotheses to be tested. This section might also be used to specify the bounds of this study and its relationship to other ongoing research (if it is an analysis of a large data set that is at the center of multiple studies, for example).

Section 2. Literature Review

This section provides a thorough, critical, and analytical overview of existing literature and scholarship relevant to the aim(s) and research question(s) guiding this study. Ideally, a literature review should be comprehensive, balanced, up-to-date, and organized so as to flow logically.

Section 3. Methodology

The methodology section should clearly and minutely detail the methods of sampling, data collection, and data analysis used. Population and instrumentation should be explained. Where standard instruments are used, they should be appropriately referenced and a discussion of their evaluation in terms of reliability and validity included. This section should also discuss any and all ethical considerations, procedures, and approvals or limitations as well as how reliability and validity are assured for this study in specific. It is imperative that this section be thorough, detailed, and logically organized and clearly presented.

Section 4. Results & Interpretation

Ideally, findings should be presented in subsections. Tables and figures should be included when appropriate for clarity. All interpretation of the results may either be saved for a separate chapter of the dissertation (within this section), or the interpretation may be included the same chapter as the results in a subsection following the presentation of the results. The results might all be presented within a single chapter or, if they are extensive, the results might be organized into a series of shorter chapters by topic.

Results should be summed up in the simplest form first before presenting analysis, in tables if possible, and then interpretation as to significance and conclusions.

Section 5: Conclusions, Discussion, and Evaluation

The fifth and final section should begin by summarizing the study, its aims, any hypothesis, and methods. Then, in referring back to the results presented in section 4, this section should summarize the analytic findings and interpretations, concluding with a discussion of the signification of the findings, whether any hypothesis was proven, partially proven, or disproven. As well, this chapter should look back on the overall study critically, both making the case for its strengths and importance and also discussing any weaknesses or limitations. Finally, the public health relevance should be discussed, including any policy recommendations or practical intervention suggestions. This is a particularly important chapter, as it is the best opportunity to offer a comprehensive view of the study and its lasting significance and to leave the reader with any parting thoughts.

Authorship

a. Independence: As with the three article model, the DPH dissertation must be substantially the student's own work, and must be judged as such by the dissertation committee/examiners. However, once this has been established, in some cases it may be appropriate to include the dissertation sponsor and other dissertation committee members as co-authors on the book generated from the dissertation, individual chapters in the book, or manuscripts developed from the dissertation for submission to professional and scientific journals.
b. The responsibilities of the first author: The student shall assume the role of first author on any book published based on the dissertation as well as on any manuscripts developed from the dissertation and submitted for publication. The responsibilities assumed of first author typically include: synthesis of the relevant literature, development of the major thesis, research question(s) and hypotheses; selection of an appropriate research design; development or adaptation of a conceptual model or framework; study design and data collection (where applicable); data management, analysis, and interpretation of results; preparation of major parts of manuscripts.
c. Co-authorship: In no cases should authorship be expected or assumed by dissertation committee members. Students may invite dissertation committee members—or external mentors—to co-author the book, chapters within the book, or a given manuscript developed from their dissertation, but the student must assume the role of "first author" on all publications (book or manuscript). To be considered a co-author on a book, book chapter or manuscript submitted for publication, faculty co-authors must contribute sufficiently to warrant co-authorship. Judgment of the potential contribution of co-authors can also be made by the student in consultation with the dissertation Sponsor, another committee member, or someone external to the dissertation committee. It is suggested that student use recommendations, such as those from the International Committee of Medical Journal Editors, as a guide to make determinations about authorship: (see http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html), which recommends that authorship be based on the following 4 criteria:
    - Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
    - Drafting the work or revising it critically for important intellectual content; AND
    - Final approval of the version to be published; AND
    - Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

    Dissertation committee members or external reviewers who may be appointed by the DPH Program at some time in the future to serve as 'examiners' for the purposes of quality control cannot serve as co-authors, but should be thought of more as 'peer reviewers'.

This guidance was first issued by the DPH Program in August 2015. It will be included in the DPH Program manual and updated annually and as the program accrues experience with the traditional dissertation model. Students and committees are expected to adhere to the most recent guidance from the DPH Program, regardless of when the student's dissertation research began.

Dissertation Defense - Checkpoints

The dissertation defense is open to the public. All committee members must be in attendance at the defense. Only the Outside Reader or the Optional Third Reader may, in extenuating circumstance, participate remotely. If both the Outside Reader and Optional Third Reader cannot attend in person, a different date must be scheduled. Questions, comments, or suggested revisions must be submitted to the committee Chair in writing at least 24 hours prior to the defense by a Reader who is not physically present. If the Outside Reader or Optional Third Reader has electronically attended, faxed/scanned email signatures for this purpose will suffice. All committee members will have read the full dissertation prior to the defense and will be prepared to pose questions and provide feedback/comments at the defense.

Student:

- The student has completed an original research project that addresses a particular public health problem or issue.
- The student has prepared a 10-15 minute formal presentation.

Sponsor:

- The Sponsor has worked closely with the student on the entire dissertation, helped select the committee and approve the dissertation for defense.

First Reader:

- The First Reader has reviewed and provided feedback on the dissertation as it progressed, approved the as the release of the dissertation chapters and the final full dissertation to the committee, and approved the dissertation for defense.

Chair:

- It is the Chair's responsibility to determine when the committee agrees that the dissertation is ready for defense, schedules the defense date, and runs the Defense - assigning the order of questioning, ensuring the productivity of the discussion, managing the voting and paperwork and reporting the outcome to the TC, EO and APO.
- The Chair has provided written feedback to the student on individual dissertation chapters and the full dissertation at least once prior to the defense.

Outside (Second) Reader(s):

- The Outside Reader (and optional Third Reader) has provided specific expertise and quality control.
- The Outside (and optional Third) Reader has provided written feedback to the student on the full dissertation at least once prior to the defense.

Other

- The APO will inform the GC Provost's Office of the defense who will then send a formal invitation to the committee and student.
- The APO will inform DPH Program faculty and students of the scheduled defense in the monthly DPH newsletter and by separate announcement.

Dissertation Defense Process

1. The defense should last approximately 2 hours, but the student and committee members should allow for up to 2.5 hours.

2. All committee members and the student are expected to arrive on time, turn off mobile devices, and remain in the room for the duration of the defense.

3. Immediately prior to the defense, the Committee will convene briefly and the Chair will check if there are any outstanding issues, describe the defense process and assign the order of the questioning. The Sponsor has the option of choosing to be the first or last questioner.

4. Once the Committee, Student, and Audience are assembled, the student will give a very brief (10-15 minute) presentation/overview of the dissertation to get the conversation started. Since all committee members will be intimately familiar with the content of the Dissertation by this point, this presentation should be 10-15 minutes in length, and in no cases should it be more than 20 minutes. This presentation should not detail all aspects of the dissertation, as all committee members will have read the dissertation in advance. It should summarize the gaps in the literature, specific aims, key findings and conclusions for each aim, and public health implications.

5. Each committee member will ask questions for approximately 15-20 minutes.

6. Audience members are allowed brief questions, moderated by the Chair.

7. After the questions end, the students and audience will be asked to leave the room.
   The Chair will facilitate a discussion of the quality of the dissertation and the defense. Then the committee will vote. There are four options,
   a) We certify that the candidate has passed the Final Examination. We accept the dissertation as presented;
   b) We certify that the candidate has passed the Final Examination. We will consider the dissertation acceptable after minor revisions are approved by the Sponsor;
   c) In our judgment the candidate's dissertation requires major revisions. It must be resubmitted for approval by the Sponsor and two members of the examining committee.*
   d) We certify that the candidate has failed the Final Examination, and make the following recommendations.

8. Committee members sign the signature page of the dissertation and the Report of Final Examination. The signature page original goes to the student and the original of the Report of Final Examination to the DPH Office for submission to the Provost' Office. The student cannot deposit without these signed documents.

*In this case, written feedback, prepared by the Sponsor and Chair, must be provided to the student on required revisions. The feedback must be shared with all committee members. The Sponsor and the Chair must review the revised dissertation to ensure that all revisions have been adequately attended to.

Student Professional Development

GC Interdisciplinary Concentrations

The Graduate Center offers a number of Interdisciplinary Concentrations. Some of these concentrations offer core courses, while others guide students in finding courses across different academic disciplines that fulfill the concentration requirements. When students finish the requirements for a concentration they are awarded a physical certificate but the IDS concentrations are not noted on their transcripts. The Interdisciplinary Concentrations include: Advanced Social Research, Cognitive Science, European Union Studies, Fashion Studies, Food Studies, Language and Literacy, Latin American and Caribbean Studies, Lesbian/Gay/Queer Studies, Psychology of Political Behavior, Public Policy and Urban Studies, Twentieth-Century Studies, and Urban Health and Society.

Concentrations will not appear on transcripts but the student will receive a hard copy document stating completion.

Many of these Interdisciplinary Concentrations offer Fellowships and Awards.

http://www.gc.cuny.edu/Academics-Research/Degree-Programs/Doctoral-Programs/Interdisciplinary-Concentrations

GC Interdisciplinary Certificate Programs

Interdisciplinary Certificate Programs are open to students enrolled in one of the existing doctoral programs offered at the Graduate Center. In addition to fulfilling the requirements of their doctoral program, students can choose to complete a Certificate Program.

Programs available to DPH students include: Africana Studies, American Studies, Demography, Film Studies, Interactive Technology and Pedagogy, and Women's Studies. Students who fulfill the requirements of a certificate program have this noted on their transcripts when they graduate.

Required courses for Certificate programs can be used, in some cases, as DPH electives. Meaning, a student in a certificate program may not need to take additional credits as the requirements for the DPH degree and the interdisciplinary certificate may overlap. This option should be discussed with the student's advisor and the director of the certificate program.

Certifications will appear on transcripts and the student will receive a hard copy document.

Many of these Interdisciplinary Certificate Programs offer Fellowships and Awards.

http://www.gc.cuny.edu/Academics-Research/Degree-Programs/Doctoral-Programs/Certificate-Programs

GC Professional Development Seminars

Students may register online for Professional Development Seminars. The courses are 0 credits and do not appear on student transcripts; they are free of charge and open to all matriculated doctoral students at the Graduate Center. Students register for them as they do their academic classes and can find them listed under "Professional Development" in the course schedule. For further information contact the Office of the Associate Provost at 212-817-7282 or RSponzo@gc.cuny.edu

http://www.gc.cuny.edu/Prospective-Current-Students/Student-Life/Professional-Development

GC Advanced Research Collaborative (ARC)

The Advanced Research Collaborative (ARC) extends the Graduate Center's global reach and prominence as an international hub of advanced study. Specifically, ARC promotes interdisciplinary research and partners with the Graduate Center's forty research centers, institutes, interdisciplinary committees, and other academic initiatives. Through its Distinguished Fellowship Program, a research-focused initiative, ARC will offer even more possibilities for collaboration between campus-based and Graduate Center faculty, in addition to visitors, doctoral students, and postdoctoral colleagues.

http://www.gc.cuny.edu/Academics-Research/Advanced-Research-Collaborative

GC Centers & Institutes
The Graduate Center is home to more than thirty interdisciplinary research centers and institutes focused on areas of compelling social, civic, cultural, and scientific concerns. Examples are the New Media Lab, Center for Lesbian and Gay Studies (CLAGS), and the Center for Urban Research.
Many of these Centers & Institutes offer Fellowships and Awards
http://www.gc.cuny.edu/Academics-Research/Advanced-Research-Collaborative/Centers-Institutes

GC Initiatives & Committees
http://www.gc.cuny.edu/Academics-Research/Advanced-Research-Collaborative/Initiatives-Committees

GC Student Business Cards
With permission from the APO, students may order GC business cards. The cards cost $17 for approximately 250. Order through the APO who will then direct you to the Office of Communications and Marketing.

Free Poster Printing at the GC
Free poster printing is available to GC students. Contact Ray Ring, Director of GC Building Design & Exhibitions rring@gc.cuny.edu 212-817-7394 and indicate that you are a student in the DPH program and include a 36" x 48" Power Point slide (which will be your poster) and include the GC logo on that slide. Logo is available by request. http://www.gc.cuny.edu/About-the-GC/Resource-Services/Communications---Marketing/Description-GC-Logo

Academic International Travel - GC Sponsored or Independent, documents required
Mandatory notification requirements and travel insurance for international academic travel by graduate students for independent research, internships, language study, practicums, conference attendance/presentation, or job interviews apply regardless of the source of funding. http://www.gc.cuny.edu/Prospective-Current-Students/Current-Students/International-Travel-Requirements-for-Current-Students

American Public Health Association Membership (APHA)
It is recommended that students join the American Public Health Association (APHA).The American Public Health Association is the oldest and most diverse organization of public health professionals in the world and has been working to improve public health since 1872. The Association aims to protect all Americans, their families and their communities from preventable, serious health threats and strives to assure community-based health promotion and disease prevention activities and preventive health services are universally accessible in the United States. APHA represents a broad array of health professionals and others who care about their own health and the health of their communities. http://www.apha.org/

Public Health Association of New York City Membership (PHANYC)
Public Health Association of New York City (PHANYC) Student Committee is dedicated to getting public health students more informed and involved in the activities of PHANYC, as well as helping to plan PHANYC activities which reflect the interests and needs of students in public health related fields in New York City.
http://www.phanyc.org/about/student.html

Career Services, Employment, Job Listserv/Lists, Awards, and Scholarships and Fellowships

Career Services

CUNY SPH Office of Student Services

The Office of Student Services has established a new initiative Interactive Student Centered Hub of Academia, Research and Entrepreneurship (I-SHARE). I-SHARE aims to facilitate student-centered environment through its various initiatives such as Mentoring program (Peer to Peer and Meet Alumni to enhance Career horizons, MATCH), Career Services, CUNY School of Public Health Student and Alumni Association, Student Innovation Initiative, and Student Resource Center.
sph.cuny.edu/student-services/

GC Office of Career Planning and Professional Development

As part of the 2011 Graduate Center Strategic Plan, the Graduate Center has launched a permanent central career planning and professional development office to prepare students for careers inside and outside the academy. Through one-on-one counseling, workshops, mentoring, job search resources, dossier review, internships, mock interviews and building relationships with employers and alumni, the Office of Career Planning and Development collaborates with faculty to ensure that GC students receive the best co-curricular training available as they prepare to enter the workforce.
http://careerplan.commons.gc.cuny.edu/

The GC Office of Career Planning and Professional Development sends weekly emails, holds online events and webinars, and has an online job search directory.
http://careerplan.commons.gc.cuny.edu/about/

DPH & CUNY SPH Employment

CUNY SPH Adjunct Positions

DPH students are encouraged to apply for adjunct positions at the CUNY SPH consortium schools (Brooklyn, Hunter, Lehman) or other four-year degree granting CUNY schools. Calls are sent via the DPH Jobs Listerv, see below. Students teaching under an adjunct line are eligible to apply for the CUNY Tuition Award. See page 75 for additional eligibility.

DPH & CUNY SPH Research Opportunities for DPH Students

A periodically updated listing of current DPH and CUNY SPH Faculty Research on which students may apply to work as paid and unpaid research assistants or as an independent study is posted on Black Board. Depending on the listing, benefits may be available. Students working on a graduate assistantship line are eligible to apply for the CUNY Tuition Award. See page 75 for additional eligibility.

Please be aware that GC doctoral students cannot act as Teaching Assistants or be asked to grade the work of peers in the same program that they are attending.

DPH Student and Alumni Job Listserv

DPH students and Alumni can subscribe and unsubscribe from the DPH job search listserv. First Register LISTSERV Password and then subscribe and unsubscribe here.

GC and CUNY Job Listings

Graduate Center jobs are listed on the Jobs at the GC page.
http://www.gc.cuny.edu/About-the-GC/Resource-Services/Human-Resources/Jobs-at-the-GC

CUNY-wide positions can be searched for on the CUNY Employment page.
http://www.cuny.edu/employment.html

DPH & CUNY SPH Awards

CUNY SPH Dean's Dissertation Grant

The Dean of the CUNY School of Public Health has committed to fund a limited number of DPH dissertation grants each year. The grant funding period is 12 months. All research funded by the grant must be completed within 12 months of receiving funding, and recipients must submit a final report of the activities completed for the grant and a final budget report detailing spending within 15 months following receipt of the grant.

Students in the Doctor of Public Health (DPH) program who have successfully defended their dissertation proposal are eligible to apply for this funding opportunity to help support the costs associated with dissertation research. In order to be eligible for a Dean's Dissertation Grant, students must be (1) actively enrolled and in good standing in the DPH program at the CUNY Graduate Center, (2) have successfully defended their dissertation proposal, and (3) Have received IRB approval for their dissertation proposal (or have been deemed exempt by the IRB).

Priority for these funds will be given to students who have also applied for external funding.

Proposals for this grant are usually accepted twice a year and the due dates will be announced via email. Additional requirements to apply for the CUNY SPH Dean's Dissertation Grant are part of the application located on Blackboard.

DPH Conference Presentation Travel Award

When funds are available, calls for applications will be sent via email for the DPH Conference Presentation Travel Award. This award is intended to fund DPH students who have been invited to give oral presentations at conferences other than APHA, or poster presentations at any conference (including APHA). Detailed eligibility requirements will be included with the call, which usually goes out towards the end of the spring semester. Students may submit proposals to cover the expenses related to conferences that they already attended or plan to attend during the current academic year.

CUNY SPH APHA Oral Presentation Awards

The CUNY SPH Dean has agreed to fund DPH students who have been invited to give an oral presentation at the annual APHA meeting. Calls for applications will be sent via email for students presenting an oral paper at APHA.

GC Institutional Aid

CUNY Tuition Award- GC Office of Financial Aid

Calls for nomination are sent via email within the first few weeks of each fall and spring semester. This award is not available during the summer. The award covers only New York State tuition charges. If an out-of-state or international student is eligible, they must pay the difference between their tuition charges and the NYS charges at the same level.

Eligibility:

1) Registered full time (7 or more credits);
2) A doctoral level student;
3) Teaching a minimum of 3 credits at a CUNY institution on an adjunct line or be on a graduate assistantship line;
4) Be within your first 10 semesters of attendance in the program;
5) Not have tuition covered by any other tuition award.

http://www.gc.cuny.edu/Prospective-Current-Students/Current-Students/Financial-Assistance/GC-Institutional-Aid

GC Certificate Program GC Centers & Institutes Fellowships/Awards

Please check the Professional Development section of this manual on page 71 for information on all available Certificate and Interdisciplinary Concentrations of which many offer Fellowships and Awards. The below are examples that are currently known to be available to DPH students.

Demography Fellowship (available to students enrolled in the Demography Certificate Program)
Continuing students should apply by submitting the following materials to Demography Certificate Program Coordinator, Shiro Horiuchi shoriuch@hunter.cuny.edu and to CIDR Director, Neil Bennett Neil.Bennett@baruch.cuny.edu: Curriculum Vitae, transcripts, any relevant publications, a 1-2 page description of research interests, and progress toward the dissertation, if applicable.
http://www.cuny.edu/about/centers-and-institutes/cidr/cpd.html

Women's Studies Fellowships & Awards

Please check each award's details as some are available only to students enrolled in the Women's Study Certificate Program, while others are available to all GC students.
Since 1977, the Center for the Study of Women and Society has promoted interdisciplinary feminist scholarship. The focus of the Center's research agenda is the study of gender, sexuality, race, ethnicity, class and nation in relationship to the experiences of women and men in societies around the world.
http://web.gc.cuny.edu/womenstudies/center/fellowships.html#Heilbrun

New Media Lab

THE NEW MEDIA LAB (NML) works with Graduate Center and CUNY faculty and doctoral students from a variety of academic disciplines to conceive and create groundbreaking multimedia projects based on student and faculty scholarly research. Our goal is to integrate digital media into traditional academic practice, challenging scholars to develop fresh questions in their respective fields using the tools of new technology. The NML is committed to a vision of new technology based on open access to ideas, tools, and resources. With ongoing support from CUNY, the New Media Lab has become a dynamic environment in which projects funded by the National Endowment for the Humanities, the Rockefeller Foundation, and other private and public sources demonstrate new approaches and methods of merging digital media, scholarship, and learning.
http://newmedialab.cuny.edu/

CUNY SPH Centers & Institutes
CUNY School of Public Health faculty are affiliated with several City University of New York research centers and institutes. These provide opportunities for faculty and student research.
http://sph.cuny.edu/research/centers-institutes/

GC Office of Research and Sponsored Programs
The Graduate Center Office of Research and Sponsored Programs (RSP) is the central administrative unit for overseeing GC-CUNY applications for, and awards of, governmental and foundation funding. The RSP is ready to answer questions about proposal preparation, submission, and administration for the entire GC Community including faculty and staff, Research Centers and Institutes, and, of course, students!

Funding opportunities, searchable databases as well as information on the Doctoral Student Research Grant Program, can be found at the link below.

Doctoral Student Research Grant Program (DSRG)
The mission of the Doctoral Student Research Grant Program is to foster a research-oriented academic culture among doctoral students and to encourage interdisciplinary discourse at the CUNY Graduate Center by: (a) providing incentives for students to model and meet, early in their careers, the requirements for succeeding in the competition for funds by clearly defining a problem, a project, and a realistic budget; (b) providing an occasion for faculty-student mentoring relationships that are oriented around the concrete problems of proposing, planning for, and executing research; and (c) furthering student professional progress by providing funds for pre-doctoral research publications, presentations, and professional networking. Applications are usually due in December or January.

http://www.gc.cuny.edu/About-the-GC/Resource-Services/Sponsored-Research-Grant-Funding

CUNY-Wide Scholarships &Fellowships

CUNY listings of available scholarships
Be aware that this section of the general CUNY website includes scholarships for all levels of higher education.
http://www.cuny.edu/admissions/financial-aid/scholarships.html

Macaulay Honors College Instructional Technology Fellows (ITFs)
Doctoral students in all disciplines at the CUNY Graduate Center are welcome to apply for the ITFs fellowship. Applicants must be currently registered full-time doctoral students at the CUNY Graduate Center in good academic standing to apply, and if selected as ITFs, must be registered, in good academic standing, and at level II or III at the CUNY Graduate Center during the period of the fellowship. Applicants should be interested in integrating technology and pedagogy for the benefit of students and faculty, both inside and outside of the classroom. They should also be eager to participate with other Instructional Technology Fellows in a multidisciplinary environment whose focus changes semester to semester.
http://macaulay.cuny.edu/eportfolios/itfprogram/

Federal Assistance

Federal Work Study

Federal Work-Study awards are based solely on financial need as defined by federal law. Federal Work-Study awards are packaged each spring for the following academic year. Because Federal Work-Study funds are limited, only students who have their FAFSA on file by the priority deadline (April 30th) are initially considered for awards. Federal Work-Study positions are assigned by the Executive Officer.

Fulbright U.S. Student Program- GC Provost's Office

Established in 1946, the Fulbright Program aims to increase mutual understanding between the peoples of the United States and other countries, through the exchange of persons, knowledge, and skills. Sponsored by the U. S. Department of State, Fulbright, the largest U.S. international exchange program, provides funds for students, scholars, and professionals in all fields of study to undertake international graduate study, advanced research, university teaching, and teaching in elementary and secondary schools.

Fulbright-Hays Doctoral Dissertation Research Abroad Program (DDRA)- GC Office of the Vice President for Student Affairs

The Fulbright-Hays Doctoral Dissertation Research Abroad Program (DDRA) funds individual doctoral students to conduct research in modern foreign languages and area studies for periods of 6 to 12 months. This program is sponsored by the U. S. Department of Education (ED) and is not related to the IIE Fulbright program, which is run by the State Department. The Fulbright-Hays DDRA Program is for students who intend to conduct dissertation research outside of the United States, excluding the countries of Western Europe, and is of particular interest to (but not limited to) students in the social sciences.

http://www.gc.cuny.edu/Prospective-Current-Students/Current-Students/Financial-Assistance/Federal-Assistance

Student Community

CUNY Academy Health Student Chapter

Initiated by DPH students, the CUNY Academy Health student chapter aims to encourage the exchange of knowledge, dissemination of research findings, and networking amongst Graduate Center students in health services research and health policy.
For more information on our AcademyHealth student chapter and how to join Academy Health, please email CUNYacademyhealth@gc.cuny.edu
cunyacademyhealth.ws.gc.cuny.edu
facebook.com/CUNYAcademyHealth
facebook.com/groups/CUNYAcademyHealth
linkedin.com/groups?home=&gid=8260481

The Doctoral Students' Council (DSC)

The Doctoral Students' Council (DSC) is the sole policymaking body representing students in doctoral and master's programs at The Graduate Center of The City University of New York.

The DSC allocates a certain amount of money each academic year to the DPH program. These funds will be used as deemed appropriate by the elected student representative.
www.cunydsc.org/
opencuny.org/dscfac/
facebook.com/cunydsc
See page 4 for more on the DSC.

DPH and CUNY SPH Committees

DPH and SPH committees have student representation. Student representatives in DPH committees represent DPH students. This includes going to meetings (once a semester, sometimes more or less), reporting any concerns students have, and also reporting back to the student body any issues or concerns that representatives feel they should know about. Calls for nominees and voting occurs every Fall semester. DPH Executive Committee (3 positions), DPH Elections Committee (1 position), DPH Admissions and Awards Committee (2 positions), DPH Curriculum and Examinations Committee (2 positions), DPH Faculty Appointments Committee (2 positions). SPH committees SPH Faculty-Student Council (1 position), SPH Curriculum Committee (1 position), SPH Assessment Committee (1 position). Incoming and continuing students are encouraged to participate.
See pages 3-4 for more DPH and CUNY SPH governance and student participation.

The CUNY Academic Commons

The CUNY Academic Commons is part of the City University of New York. We are dedicated to the free expression of our users in a collaborative and sharing environment. We are a community that seeks to use the Academic Commons as a means of fulfilling our highest aspirations for integrating technology into our teaching, learning, and collaborating. Members of the faculty, administration, staff, and graduate students of the City University of New York may register on the Site. We will take all reasonable measures to keep information and users safe.
Check the commons for scholarship, fellowship, and award opportunities.
http://commons.gc.cuny.edu/

OpenCUNY
The OpenCUNY Academic Medium is a student-based, open-source, academic, participatory digital medium for the CUNY Graduate Center community.
To date, OpenCUNY has worked with GC students to develop interactive open-source environments for chartered organizations, student associations, GC-based courses, student-run conferences, graduate research, health initiatives, student activism, personal websites, and an array of DSC initiatives.
http://opencuny.org/

Graduate Center Student Intervention Team (GCSIT)
The Graduate Center Student Intervention Team (GCSIT) supports a healthy and safe on-campus environment by assisting students whose behavior is worrisome or disruptive.
Any member of the college community can reach out to the GC Student Intervention Team to report a concern about a student through our on-line reporting form or by calling a the Student Affairs Office at x 7400. The GCSIT will review the report and take appropriate action. Reports may be made confidentially.
www.gc.cuny.edu/Prospective-Current-Students/Student-Life/Resources/Behavioral-Intervention-Team-%28BIT%29

Facebook - CUNY Graduate Center DPH Student Group
The DPH program has a student run Facebook group page.
facebook.com/groups/CUNYDPH/

Facebook - CUNY SPH
facebook.com/CUNYSPH

LinkedIn - CUNY SPH
linkedin.com/grp/home?gid=8244346

Twitter - CUNY SPH
twitter.com/CUNYSPH

Student Electronic Resources

GC Email Accounts
It is a policy of the GC that students regularly check their GC email accounts. Please note that students redirect at their own risk and it is recommend students periodically check their GC email account as they will need to change passwords at least annually. As of May 2015, students are required to have an @gradcenter.cuny.edu email address. This does not apply to faculty or staff who continue to use @gc.cuny.edu addresses.

Banner ID
All GC students are assigned a Banner ID number. This nine digit number is the unique identifier that students use for all administrative purposes with the GC.

The Graduate Center's Preferred Name Policy
While CUNY recognizes the importance that a change of name might have to students during their time with the University a preferred name is not a legal name, but is generally used to change how others refer to you. For this purpose, students may identify a preferred name to be recorded in the student system. Documents and records that may display a preferred name include, among other things, course rosters, student identification cards, student email addresses, and other documents issued by the University. A preferred name will not be reflected on, among other things, a student's official academic record, diploma, or transcript. To change the name that is displayed/reflected on the official academic record, diploma, or transcript students must follow the instructions on the Name Change Request Form available in the Registrar's Office. Official and legal name changes require specific documentation outlined on that form. The preferred name request form is available on the Registrar's webpage.

Blackboard
Blackboard is an online course management system. In addition to courses that students are registered for, all DPH students have access to CUNY SPH and DPH student Blackboard organizations.

The GC Student Handbook
The Student Handbook for the Graduate Center (GC) of the City University of New York (CUNY) available at http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf. This handbook describes all relevant GC policies and is the official document for students at the Graduate Center. Students are encouraged to review this handbook and are expected to be familiar with all relevant GC policies.

Manhattan Research Library Initiative (MaRLI)
Any New York Public Library cardholder in good standing is eligible to apply to participate in a new library service that offers an unprecedented level of access to our collections. The Manhattan Research Libraries Initiative (MaRLI) offers approved NYPL cardholders the ability to borrow select research library material for at-home use for the first time ever. Additionally, MaRLI participants will be granted access to select materials owned by Columbia University and NYU.
http://www.nypl.org/help/research-services/MaRLI

CUNY Libraries Offer Free Access to the New York Times
Register for the NYTimes Academic Pass for free access through the NYTimes website and smartphone apps. If you already have a personal NYTimes subscription, read this post to find out how to cancel it and resubscribe through the Academic Pass. It also includes updated instructions about what to do if you already have a nytimes.com account (free or paid) tied to your CUNY email address.
http://gclibrary.commons.gc.cuny.edu/2014/04/09/free-nytimes/

Information for DPH Faculty Members

DPH Faculty Members- Roles, Duration, Course Release & Responsibilities

Role	Term	Course Release	Responsibilities
Executive Officer	Three academic years	Four course releases per year (12 credits total)	See Bylaws and above
The Deputy Executive Officer	One academic year	Two course releases per year (6 credits total)	See Bylaws and above
Track Coordinator	Three academic years	Two course releases per year (6 credits total)	See Bylaws and above
Advisor	Until dissertation stage	No course release	See Bylaws and above
Faculty Member	Three academic years, with option for renewal	Releases for defined activities as shown on this chart	See Bylaws, above, and PSC-CUNY contract
Chair of a DPH Committee	Three academic years	No course release	See Bylaws and above
Member of a DPH Committee	Three academic years	No course release	See Bylaws and above
Chair of First Exam Committee	One exam, as assigned	No course release	Chairs Faculty Committee that rates First Exam
First or Second Reader of First Exam(s)	One exam, as assigned	No course release	See above
Sponsor, Chair, and Member on a Second Exam Committee	From proposal to pass of second exam	No course release	See above
PUBH 900 Supervised Dissertation Research: Dissertation Sponsor	From dissertation proposal to defense	One course release for each 5 semesters of sponsorship§ (can be accrued but not banked) (3 credits total)	See above
Chair and Reader on a Dissertation Committee	From dissertation proposal to defense	No course release	See above
PUBH 861 Independent Study: Faculty Sponsor	From registration to completion	One course release for each five semesters of supervision can be accrued§ (3 credits total)	See above

§For example, sponsoring one student for five semesters or five students for one semester each both result in one course release. Once one release has been accrued it must be used.

GC Elimination of the use of Gendered Salutations and References of Students
Effective Spring 2015, the GC's policy is to eliminate the use of gendered salutations and references in correspondence to students, prospective students, and third parties.

Instructor to Student Course Ratio
A course will run with a minimum of five registered Graduate Center students. Courses that are team taught by two instructors require a minimum of 12 GC students. However, the decision that a course requires to be team taught is an academic decision, not one based simply on headcount and requires approval of the EO. A second instructor will not be added to a course after the first day of registration for continuing students unless the Provost has reviewed the program's reason for the requested and grants permission.
Minimum enrollment excludes auditors, non-matriculated students, and CUNY masters and undergraduate permits. The single exception is the PUBH 898 Dissertation Seminar where a minimum headcount enrollment that includes Level 3 auditors (PUBH 900) is acceptable.

CUNY SPH Syllabus Templates
All DPH course syllabi must follow the required SPH format. Templates with DPH core and track competencies are on Blackboard.
Faculty are to submit syllabi upon request from the DPH and/or CUNY SPH offices for records and to maintain accreditation.

Higher Education Opportunity Act Mandate to Notify Students about Required Course Texts
The College is required by the Higher Education Opportunity Act to make the costs of required course materials known to students when they register for classes.
It is necessary to report all required materials for a course that is running. For situations when an instructor does not know the edition of a book, a sample ISBN may be entered. If no texts are required note "no required texts." If at the time of entry you do not know which texts you plan to use, select texts you are likely to use and note "subject to change."

Change of Grade Forms
Faculty request a Change of Grade Form from the APO. Change of grade forms may only be signed and submitted by the instructor to the APO.

Notes on Admissions
The GC Admissions Office puts a hold on accepted applicants who have accepted our offer only when they have not completed a required degree (e.g. MPH). If the accepted applicant is missing Masters Core (Biostatistics; Epidemiology; Environmental Health; Social and Behavioral Dimensions of Health; & Health Policy and Management), the GC does not track this information and it is a responsibility of the student, advisor, and TC to do so.
Accepted students who wish to defer must write an email appealing to defer to the Chair of the Admissions Committee, the Track Coordinator, or the EO. The Chair notes the deferral to the GC Admissions Office either directly or via the APO.
If an incoming student wishes to take a Leave of Absence, they must instead defer.

Faculty Hiring DPH Students
Students may work as research assistants by individual grant holders, but may not act as Teaching Assistant or Graders in the same program that they are attending.

DPH Reappointment
Faculty will be requested to submit a self-assessment report along with a current CV for reappointment to the DPH program. Reappointments occur every three years.

Graduate Center Faculty Policies & Information
Please check the Graduate Center Governance, Policies, & Procedures links for additional information on GC faculty related regulations.
gc.cuny.edu/About-the-GC/Resource-Services/Governance-Policies-Procedures
gc.cuny.edu/Faculty

Room Reservation/Office Space
DPH faculty may make use of the conference room in 3317 at the Graduate Center by reservation only. It should be known that this space is shared by another Graduate Center doctorate program and is not available to the DPH program on Fridays. The conference room in 3317 can be reserved for office hours only by contacting the APO. Larger conference spaces and seminar rooms can be reserved by contacting the APO. The conference room should not be requested for regular class meetings.
Rooms must be requested two weeks in advance and no less than one week in advance.

GC Faculty Building Access After-hours
Faculty may request to the EO to grant after-hours authorization to the Director of Security & Public Safety.

GC Faculty ID Cards
Graduate Center ID Cards can only be obtained in person during regular business hours. Faculty and instructors should contact the APO to request a card. ID Cards require a valid ID Sticker for each semester which can be retrieved from the APO.
Lost ID Cards need to be reported immediately to the Office of Security at (212) 817-7777.

GC Faculty Computer Login and E-Mail Account
A valid Graduate Center Computer Account is required to access computers at the Graduate Center. Once an instructor is appointed to the faculty of The Graduate Center, the APO will contact the faculty member with the required Computer Account User ID and Password. The faculty member will be responsible for creating new his/her password. Problems with GC computers and email should be addressed to the GC Help Desk Helpdesk@gc.cuny.edu (212) 817-7300.
Additionally, it is a GC policy that faculty regularly check their GC email accounts or have it forwarded to their primary CUNY email account.
https://wa.gc.cuny.edu/owa/auth/logon.aspx?url=https://wa.gc.cuny.edu/owa/&reason=0

Faculty Courses in Blackboard
All Blackboard courses are hosted on centralized servers at CUNY CIS. DPH courses are created automatically using data provided by the Graduate Center Registrar's Office. Co-listed courses with the CUNY SPH consortium can be merged (e.g. PUBH 820 Epidemiologic Methods I/EPI 750/ PHE 723). If you are able to log in successfully as a faculty member but do not see your courses listed or need help merging courses, contact the GC Blackboard Administrator directly, Achia Samuels asamuels@gc.cuny.edu 212-817-7314 and/or the Help Desk helpdesk@gc.cuny.edu 212-817-7300.

Faculty Web/Banner
Unlike all other CUNY campuses, the GC uses Faculty Web for attendance and grade recording.
To access Faculty Web, use your 9-digit Banner ID. Upon appointment, you will be notified of your Banner ID. When logging in, be sure to use all the digits including the lead zeros. Your Banner ID and PIN will be the same from semester to semester. Problems with Banner and logging into Banner should be addressed to the GC Office of the Provost at 212-817-7200 provost@gc.cuny.edu.
https://ssb.gc.cuny.edu/prod/plsql/twbkwbis.P_WWWLogin

CUNYfirst and the GC
The GC has not fully transferred over to using CUNYfirst and it is not expected to do so until Fall 2016.

Fieldwork Handbook

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH & HEALTH POLICY
2015-2016

Revised 3/8/2016

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1. Introduction

The Council on Education for Public Health (CEPH) is the accrediting body for public health programs and schools in the United States The CUNY Graduate School of Public Health and Health Policy (GSPHHP) is CEPH-accredited as of June 2011, and this includes the MPH and MS degree programs in GPH, HCPA, CBPH, BIOS/EPI, COMHE, EOHS, HPM & NUTR; and the DPH program.

CEPH requires that all MPH students in its accredited programs *demonstrate the application of basic public health concepts through a practice experience* that is relevant to the students' areas of specialization.

In the GSPHHP, fieldwork experience provides MPH and MS students with the opportunity to demonstrate their ability to use the knowledge gained during their graduate coursework.

Each MPH and EOHS-MS student completes a supervised practice experience while signed up for a fieldwork course. The goal is for students to find field organizations appropriate to their specialization and on the basis of their individual interests, professional goals and needs.

The goal of the MPH fieldwork experience is to give students the opportunity to develop, manage, or lead evidence-based public health practices in real-world settings. Students strengthen the core competencies they have learned in the classroom by testing them in organizations that have unique constraints, opportunities and challenges. They develop professionally while helping an organization to advance its own public health agenda in a culturally competent manner. The supervised practice experience strives to improve students professional self-confidence through involvement in developing, planning, organizing, executing and evaluating public health activities. Fieldwork placements may involve program planning, implementation or operation, applied public health research, community health education and outreach, health advocacy or other appropriate public health-related work.

During the fieldwork period, students are required to follow the policies, rules and regulations of the field organization, as well as seek and accept the field preceptor's guidance and appraisal of performance throughout the placement. Students should share with the field preceptor any questions and concerns regarding the progress of the fieldwork and secure approval of the field preceptor for plans how to best use, disseminate or publish information gleaned from the project.

Fieldwork faculty are responsible for developing and implementing policies regarding the approval of preceptors and placement sites and for supervising students in the selection and evaluation of their field placements. They also advise students on the relationship between fieldwork and capstone projects so that the students will be adequately prepared for capstone at the completion of their fieldwork.

This packet presents the policies and procedures for selection, approval, execution, completion and evaluation of the fieldwork experience and provides the forms that must be submitted as part of the fieldwork course.

For additional information, please refer to the fieldwork syllabus.

Prerequisite: Completion of at least **18 credits** toward the master's degree, including at least 3 required core courses (biostatistics, epidemiology, and the course most relevant to your specialization) and at least 2 courses in students' specialization.

2. Fieldwork Site

Options

Depending on opportunities available and scheduling demands, students generally have two kinds of options for their fieldwork, either working with: 1) Government or private organizations: the student works with a fieldwork preceptor at that organization to define a field project that will be appropriate for a capstone project, or 2) CUNY or other academic institutions: the student works with a faculty member on a public health-related research project which may then become a master's essay (provided the student has the required GPA). A wide range of organizations and agencies can provide a valuable field practicum experience for the student. In general, any organization that researches, provides, plans for, coordinates, organizes, pays for, or regulates public health services is a valid training site.

Site selection

Students can identify a fieldwork opportunity in a variety of ways: through their own networks and outreach efforts; with assistance from fieldwork or other faculty, or; via a position they see posted. Fieldwork can be conducted in a wide variety of settings. Most important, the student must be conducting public health work at the site, and with sufficient responsibility to apply some of the skills and knowledge acquired through the MPH program. The fieldwork faculty advisor is responsible for approving the fieldwork site with the approval of the fieldwork contract (see Appendix for a template model).

Examples of types of sites include:

- Federal agencies, such as the USDHHS, Veterans Administration, CDC, USDA, OSHA
- State, county, or city health departments
- Health and social service organizations
- Managed care organizations
- Neighborhood health centers, community clinics, and community mental health centers
- Hospitals (public, nonprofit, for-profit) and multi-specialty medical practices
- Environmental health consulting companies
- Industrial settings
- Early childhood programs, public schools, and private schools
- Academic or other non-governmental research institutes

Expectations of the site

Participating agencies and organizations agree to provide the student with a suitable field experience for a designated period of time and agree to assist in the professional development of that student by identifying an appropriate preceptor at the agency or organization. The agency agrees to provide the student with all materials, equipment, and space needed to conduct the work in a professional work environment. The agency submits a written and signed letter of a confirmation that identifies the student, the agreed upon scope of the fieldwork project, and expected deliverables from the student.

Criteria for site selection

- The site is able to provide appropriate public health experience as it relates to the student's career goals and area of concentration.
- The site is able to provide support and space for the student appropriate for the student's experience.
- The environment of the site is safe for the student's field practicum experience. The site has an available preceptor who is qualified and able to spend time with the student and provide guidance.
- The preceptor has an understanding of the educational needs of public health students, including the need to increase responsibility and independence gradually.
- If fieldwork is to be performed in a student's own current job setting, the student must generally identify a different supervisor and engage in a substantially different assignment which is outside the scope of his or her usual activities.

3. Major Players

Close cooperation is essential between the following players:

- Student (the masters degree student)
- Fieldwork faculty member -- the faculty member from the student's program assigned to the fieldwork course for the semester during which the student is registered for the course (also referred to as the 'fieldwork faculty').
- Fieldwork Preceptor (also known as 'fieldwork supervisor,' or 'preceptor')

Student

Students are primarily responsible for developing a scope of work for the fieldwork, in consultation with their preceptor and the faculty fieldwork member, and for carrying out that scope of work. Students are also responsible for submitting appropriate paperwork at the beginning, during, and at the end of the enrolled Fieldwork semester.

Students are expected to attend scheduled classes held during the Fieldwork semester and submit periodic assignments. Three didactic sessions are included in the course to augment student competencies on project planning, management and leadership, and ethical research, and to prepare the student for the Capstone project.

During the course of the fieldwork project, students are expected to meet regularly with the preceptor to discuss progress and raise any questions or problems regarding the work. Students are expected to treat the fieldwork as they would any job and follow organizational policies and meet all commitments to the agency. In addition, if the student feels that the field experience will not enable him or her to produce the agreed upon deliverables (whether from lack of access, lack of supervision, changing organizational priorities, etc.) it is up to the student to alert the field supervisor.

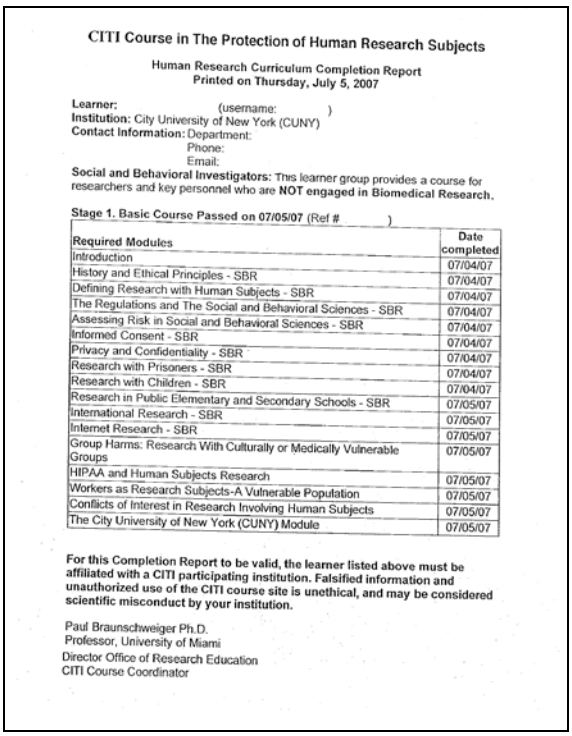
Responsibilities of the student for the fieldwork experience include:

- Identifying and organizing the fieldwork project
- Submitting appropriate paperwork
- Following the policies, rules, and regulations of the field agency or organization.
- Maintaining the agreed upon working hours.
- Maintaining a professional attitude and conduct.
- Seeking and accepting the field preceptor's guidance and appraisal of performance throughout the work period.
- Sharing with the field preceptor any questions and concerns regarding the progress of the field work.
- Planning for conferences with the fieldwork preceptor.
- Attending requested meetings and workshops.
- For some programs, maintaining a weekly fieldwork log and submitting all logs to the fieldwork faculty member at the end of the course.
- Submitting to the host agency all agreed upon deliverables within the time frames indicated by the preceptor.
- Providing the host agency with a copy of the student's final capstone project.
- For further information, please contact the fieldwork faculty member in your area of concentration.

Fieldwork Faculty Member

Within each degree program, the designated fieldwork faculty member approves fieldwork contracts, tracks required fieldwork paperwork, provides guidance and support to the student and site supervisor during the semester, and determines the student's grade for the course (pass or fail), based on a review of the fieldwork supervisor's evaluation and additional fieldwork requirements. **The fieldwork faculty member provides guidance to the student to maximize the learning potential of the field experience.**

- All fieldwork faculty members must maintain a valid human subjects training certificate, even if they are not currently conducting research with human subjects.
- The fieldwork faculty member guides and tracks the development of fieldwork contracts, submission of IRB determination forms, and evaluation forms.
- The fieldwork faculty member assists students and preceptors in resolving problems that arise during fieldwork placement.
- The fieldwork faculty member assists students in the initial conceptualization of the Capstone project from the field experience.
- The fieldwork faculty member instructs students on topics aimed at improving the field experience and preparing the student for the capstone course.



CITI Course in The Protection of Human Research Subjects

Human Research Curriculum Completion Report
Printed on Thursday, July 5, 2007

Learner: (username:)
Institution: City University of New York (CUNY)
Contact Information: Department:
Phone:
Email:

Social and Behavioral Investigators: This learner group provides a course for researchers and key personnel who are **NOT engaged in Biomedical Research.**

Stage 1. Basic Course Passed on 07/05/07 (Ref #)

Required Modules	Date completed
Introduction	07/04/07
History and Ethical Principles - SBR	07/04/07
Defining Research with Human Subjects - SBR	07/04/07
The Regulations and The Social and Behavioral Sciences - SBR	07/04/07
Assessing Risk in Social and Behavioral Sciences - SBR	07/04/07
Informed Consent - SBR	07/04/07
Privacy and Confidentiality - SBR	07/04/07
Research with Prisoners - SBR	07/04/07
Research with Children - SBR	07/04/07
Research in Public Elementary and Secondary Schools - SBR	07/05/07
International Research - SBR	07/05/07
Internet Research - SBR	07/05/07
Group Harms: Research With Culturally or Medically Vulnerable Groups	07/05/07
HIPAA and Human Subjects Research	07/05/07
Workers as Research Subjects-A Vulnerable Population	07/05/07
Conflicts of Interest in Research Involving Human Subjects	07/05/07
The City University of New York (CUNY) Module	07/05/07

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

Preceptor

The preceptor is the key to a successful fieldwork experience. The preceptor serves as both supervisor and mentor. Preceptors are expected to provide students with an orientation to the organization and project, meet with students regularly, and provide guidance and feedback. The preceptor is expected to have expertise in the area of the student's project so proper guidance can be provided, and an MPH or other graduate degree, or significant and demonstrable experience in a public health management role. Preceptors help students develop a written fieldwork contract specifying the expectations for the fieldwork. Preceptors also complete an evaluation of the student's performance at the end of the work experience, as the preceptor has the primary responsibility for supervising and guiding the student in the development and implementation of the fieldwork project. The role of the preceptor includes the following activities:

- Assist the fieldwork student in determining specific, mutually- agreeable, written fieldwork objectives & deliverables to the agency.
- Orient the student to the field organization's mission, programs, policies, protocols.
- Commit time for instructional interaction & dialogue w/ student.
- Provide supervision of the student's activities.
- If indicated, resolve conflicts w/ agency or organization policy.
- Prepare an evaluation of the student, and discuss it with the student prior to sending it to the fieldwork faculty member.
- Transmit the student's final evaluation to the student's fieldwork faculty member.
- Share any comments and/or suggestions about the field experience with the course fieldwork faculty.
- Allow student to use some or all of the work product to prepare capstone paper.

4. The Relationship Between Fieldwork and Capstone

- Fieldwork is a prerequisite for Capstone. In other words, students may start the Capstone course only when they have completed their fieldwork and understand how it will inform the Capstone project.

- The fieldwork experience provides the basis and the foundation for the Capstone project. During fieldwork, the student is involved in public health practice, and shapes a research question and study design for executing through the Capstone project. Generally, the data or information

- The Capstone paper reflects the research question and investigation informed by the student's fieldwork experience.

    - The Master's Essay is an exception to this model. Here, students work with individual faculty members or academic institutions on specific research projects. These must be approved by the faculty member who will be working with the student and by the fieldwork faculty. To be eligible for the Master's Essay option, students must have a minimum GPA of 3.8.

    - In some circumstances, when the fieldwork project does not generate data as expected, the Capstone project may be based on an activity or data analysis other than the fieldwork experience. If this decision is reached during the fieldwork course, the new plan must be approved by the fieldwork faculty advisor. If it is reached at the beginning of the Capstone course, the decision and plan must be approved by the Capstone faculty advisor.

- During the fieldwork semester, students prepare and submit several deliverables based on their work in the placement, and in preparation for the Capstone project. These are discussed below.

5. Fieldwork Timeline

When?	Activity
Preparation for supervised fieldwork	• Notify your program advisor of intention to register for fieldwork, and discuss your eligibility for the course. • If you are searching for fieldwork opportunities or assessing potential fieldwork sites, contact the GSPHHP fieldwork coordinator and your academic advisor to help identify target sites and to confirm program fit. • **Fieldwork Information Sessions are held twice each semester, and offer information and guidance for identifying and securing a placement. Student attendance to one of these sessions is highly recommended.** • Identify a fieldwork opportunity. Working with the fieldwork faculty advisor and/or the GSPHHP fieldwork coordinator, secure the placement with the preceptor via an approved Fieldwork contract (template is included in the Appendix). • Once you have submitted a finalized, approved Fieldwork contract, you are eligible to register for the course in the upcoming semester.
Carrying out and participating in supervised fieldwork	Begin the fieldwork placement. • IRB approval is required before the student can begin any data collection activities. The student works with the faculty advisor to develop and finalize submission to the IRB. All students must present a current CITI certificate, even if the project does not require IRB review (eg, systematic literature reviews, secondary analysis of publicly available data) • Submit assignments, attend class meetings, and meet with your fieldwork faculty advisor, as instructed. It is recommended that you keep a work/time-log of fieldwork activities so you can recall how your time was spent, confirm the number of hours in the placement (expected 180 hours total), and articulate the processes involved. • Students will complete two progress reports to track their progress, assess potential challenges, and identify solutions. • Faculty may choose to require students make additional submissions, such as a Rapid Lit Scan, a project Logic Model, and a project Gantt Chart.
Successful completion of the fieldwork experience	Fieldwork students must submit and receive a passing grade for **several deliverables** to successfully complete the supervised fieldwork requirement: (1) Submit two evaluation forms: the **Student's Evaluation of Fieldwork Experience Form, and the Preceptor's Evaluation** of your performance (instructions for both are included in the Appendix). (2) Submit a **Literature review:** conduct a brief literature review (2-4 pages) during fieldwork to frame and guide the Capstone proposal (example included in the Appendix). (3) Complete and submit your **Reflections on Fieldwork** (instructions are included in the Appendix). (4) As preparation for the Capstone class, develop and submit **a Capstone Proposal** (outline included in the Appendix).

6. CUNY Policy for Student Research with Human Subjects and IRB

All students are required to complete and submit an **Institutional Review Board (IRB) Research Determination Form** to the fieldwork faculty advisor early in the Fieldwork course. This brief form describes the project, as well as any human subject involvement, and institutions/individuals involved. The faculty advisor will work with the campus IRB office to review this document and assess whether a full IRB proposal must be submitted, or if the project is exempt from human subject research issues. For the purposes of this submission, the student is the Project Investigator and the fieldwork faculty is the faculty advisor. Campus IRB approval or exemption is required before the student can begin data collection.

Research in CUNY

Research conducted in the City University of New York (CUNY) is subject to federal regulations, which require that all research protocols involving human subjects be reviewed by an IRB office. However, these regulations allow many types of course-related studies to be exempted from IRB review, depending on potential risks to participants.

Definitions

Research: Research involves "a *systematic* investigation, including research development, testing and evaluation, designed to develop or contribute to *generalizable* knowledge." (Citiprogram.org)

Human subject: "A human subject is a living individual about whom an investigator conducting research obtains 1) data through *intervention* or *interaction with the individual*, or 2) *identifiable* private information." (Citiprogram.org)

Risk: The probability of harm or injury (physical, psychological, social or economic) occurring as a result of participation in a research study.

Source: *Health Sciences Doctoral Programs Faculty Handbook* (Aug 2009).

7. Fieldwork Waiver

A *practical experience* is required of our students in order to assure the competency of our graduates when they enter the field of public health. The professional degree student who graduates from CUNY GSPHHP, as well as all other accredited schools of public health, must have "skills in basic public health concepts and demonstrate the application of these concepts through a practice experience that is relevant to the students' areas of specialization."

In very rare instances, fieldwork is waved for MPH students who are admitted to the CUNY Graduate School of Public Health and Health Policy already possessing extensive public health experience. Before a waiver is granted, the student must demonstrate "experience in application of basic public health concepts and of specialty knowledge to the solution of community health problems." Public health knowledge includes the core competencies as well as a population approach to health problems, use of a prevention framework, and collaboration with community partners. The student must also show that their previous experiences relate to specialty knowledge acquired in their specialization track.

Eligible students should discuss the possibility of a waiver with their academic advisor within one year of enrollment. The associate dean for academic affairs will determine if the written summary of the student's experiences demonstrates an adequate applied public health experience in the appropriate area of concentration.

The summary should include:

- Name of the organization(s)
- Name, title and contact information of supervisor(s)
- Dates and approximate number of hours of experience
- Description of how the experience demonstrates application of the core and specialty public health knowledge. (Refer to the core MPH competencies and the competencies for your specialization.)

When all parties have signed off, the original form and attachment should be forwarded by the student to the school office for inclusion in the student's academic file. Copies should also be sent to the track advisor, fieldwork faculty member representing the student's program, and the GSPHHP evaluation coordinator.

If a waiver is granted, the student is expected to select another course to fulfill the credit requirements of the program.

The format for requesting a fieldwork waiver is as follows:

The student requesting a fieldwork waiver must submit the information requested below, with the accompanying statements, and attach to it a summary of her/his public health experience. This summary should tell us the type of educational or professional experiences you are submitting in consideration of a waiver of your practice requirement. The summary should include the name of the organization(s); name, title and contact information of supervisor(s); dates and approximate number of hours of field-based experience; and a description of how the experience demonstrates application of knowledge from the core and specialty public health areas. This waiver form must be submitted to the GSPHHP Associate Dean of Academic Affairs within twelve (12) months of enrollment.

I request a waiver of the fieldwork course. I have extensive public health experience and have acquired skills and content in the core and specialty public health areas. A summary of these experiences is attached.

Student _____

E-mail address_____

Degree, track and campus _____

Faculty advisor _____

E-mail address _____

Signatures in support

Student's signature _____ Date_____

Program director's signature _____ Date_____

Associate dean's signature _____ Date _____

APPENDIX

FIELDWORK CONTRACT TEMPLATE

[TO BE PLACED ON HOST ORGANIZATION LETTERHEAD]

Project title

[Reflects the general focus of the work, ie, topic and setting, or more specific proposed research question, ie, investigation of specific public health problem in type of setting with population group]

[Date]

Dear Fieldwork Faculty Advisor:

This represents an agreement between [**student name**], MPH student at the CUNY Graduate School of Public Health and Health Policy, and [**preceptor name, position title, host organization**] describing the tasks and goals of both parties as they relate to the supervised fieldwork to be performed beginning [**start-date for placement**] and projected to end [**end-date for placement**] on the [**name of project, if applicable**]. The fieldwork student and preceptor agree that the fieldwork student is responsible for 180 hours of service in this role.

Project background

[Provide one or two paragraphs describing the background and context for the project, including, if applicable, topic of focus, methodology, host organization.]

Project plan

[Describe the specific project(s) in which student will be involved for placement.]

Student tasks and responsibilities

[List the specific activities which the student will carry out in the fieldwork placement, and its relevance to public health.]

Preceptor responsibilities

[Provide two to three sentences affirming the preceptor's responsibility for providing guidance supervision, and evaluation for the student in the placement, confirming the student will be allowed to use the project data for her/his Capstone paper, and describing the preceptor's own public health experience, including any graduate education.]

Agreed to by:

[Student signature	**[Preceptor signature**
Student name	**Preceptor name**
Date]	**Date]**

LITERATURE REVIEW EXAMPLE

Implementing a program to increase school meal participation and improve the school food environment in a low-income New York City elementary school

[Student Name]

In a recently released Food Research and Action Center (FRAC) report, the South Bronx (New York 16th Congressional District) ranked first and central Brooklyn ranked sixth (New York 10th Congressional District) in food hardship.[1] This report's unsettling results urge us to further explore hunger and food security, defined as "including both physical and economic access to food that meets people's dietary needs as well as their food preferences,"[2] in New York City (NYC) where 37% of residents experienced difficulty affording food in 2010.[3]

In the United States, an estimated 14.7% of households were food insecure in 2009.[4] However, among households below the official poverty line ($21,756 for a family of four), 43.0% were food insecure and 24.9% and 26.9% of Hispanic and Black households respectively were food insecure compared with 11% in whites.[4] Twenty-one percent of households with children under 18 years old were food insecure with single parent households having even higher rates: 35.6% in single mothers and 27.8% in single fathers.[4] The higher than average prevalence of food insecurity in families with children raises concerns of the health of children. While caloric energy needs are generally met by food insecure children, dietary quality may be compromised.[5] Children from food insecure households have greater odds of being in poor health, having a chronic condition, and having asthma than children from food secure households.[6]

The association between food insecurity and obesity is well-established, with the risk of obesity being greatest in non-whites.[7-10] The growing epidemic of childhood obesity disproportionately affects children of low-socioeconomic status (SES) and certain ethnic minority groups, the same groups that are at high risk for food insecurity. Data from the 2007 National Survey of Children's Health (NSCH) show Hispanics and non-Hispanic Blacks have more than two times the odds of obesity than non-Hispanic whites.[11]

Consideration of food insecurity and its associated health risks adds to the challenge of our nation's call to aggressively address childhood obesity. School meal programs are one avenue to strategically address both food security and improve the diets of food insecure children at high risk for developing obesity and diet-related diseases. The federally assisted National School Lunch Program (NSLP) and the School Breakfast Program (SBP) are provided through the United States Department of Agriculture Food and Nutrition Service (USDA FNS). The NSLP serves free and low cost lunches to more than 31 million children each school day[12] while the SBP provides free and low cost breakfast to 11.1 million students per day.[13] School meal participation and access have shown to strengthen food security; a recent study showed that households with access to the SBP had lower marginal food insecurity than households without access to SBP.[14]

School meals provided by the NSLP and SBP follow nutritional requirements based on the Dietary Guidelines for Americans (DGAs), and for many NSLP and SBP participants, school meals may be the most nutritious food consumed in their diets. The literature indicates that dietary intake in NSLP participants is superior to non-participants in certain areas including lower consumption of energy-dense, low-nutrient foods; lower consumption of sugar-sweetened beverages; lower caloric intake; higher fiber intake; and higher calcium intake.[15,16] School Breakfast Program participants have been shown to have higher intakes calcium, magnesium, phosphorus, fruits and vegetables, and lower intakes of red meat and cholesterol than non-participants.[17] Another study found that in an ethnically-diverse, low socioeconomic status (SES) population with low fruit and vegetable consumption, NSLP provided the primary source of FV for schoolchildren,[18]suggesting that school meals are an important source of nutrient dense food in low-SES, minority populations. In addition to the nutrition provided by school meal programs, NSLP and

SBP participation also provide a protective effect against obesity in girls.[19] Another study found that SBP participants had lower body mass indices (BMI) compared with non-participants.[20]

Despite positive outcomes seen with school meal programs, NSLP and SBP, NYC has low participation rates in both programs which are administered by the NYC Department of Education Office of SchoolFood (SchoolFood). Of 1.1 million children in NYC public schools, 70% are eligible for free and reduced-price meals.[21] However, only 38% of NYC high school students, 70% of middle school students, and 84% of elementary school students participate in the school lunch program.[21] Breakfast has a citywide participation rate of 22% despite being free to all NYC students.[21] In the South Bronx where the poverty rate is 41%[22] and where food insecurity is very high,[1] ensuring that children are participating in SchoolFood programs can have a profound effect on both food insecurity and adverse diet-related health problems.

Schools represent an ideal location for interventions that can improve both school meal programs and school environments. Children spend more time in school than any other institution and consume up to 50% of their daily calories during school hours,[23] making the school food environment a unique location where healthy eating behaviors can be taught, encouraged, and reinforced. The Institute of Medicine identifies the school food environment, which encompasses all foods eaten in and around a school, as a key area for targeting the childhood obesity in the United States.[24]

Acknowledging the school environment as a focus area for addressing childhood obesity, congress passed the Child Nutrition and WIC Reauthorization Act of 2004 which mandated that all schools participating in the NSLP enact local wellness policies that set standards on school meals and support a healthful school food environment.[25] Researchers and organizations also call for strong school wellness policies, but there is a lack of evidence-based strategies for their implementation.[23,26,27] Major challenges and barriers include the lack of funds, dedicated personnel, and time needed to implement and maintain wellness policies and work towards a healthier school environment.[28-30] Strategies to address these challenges are also sparse in the literature, especially at the local and building-level. Tool kits and practical guides are available through hunger, nutrition, and wellness organizations; however, the guides are not evidence-based and are largely anecdotal.[31-33]

We hypothesized that there is a gap between policy mandates and building-level implementation that is especially apparent without a key staff member dedicated to school wellness. Additionally, low school meal program participation rates in NYC indicate that there are barriers to participation that should be addressed. The City Harvest Healthy Schools program aims to fill this gap by placing dedicated Fieldwork students in low-resource NYC schools to provide manpower, strategies, and resources to improve school meal participation and the food environment within the school community which in turn can increase food security and access to healthy food in NYC's high-need communities.

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INSTRUCTIONS FOR 'REFLECTIONS ON FIELDWORK'

Students are required to think about their fieldwork experience and provide a written reflection when they have completed the placement.

Your reflections statement should be 2-4 pages in length, and address the following:

- The extent to which your graduate course work prepared you for the fieldwork experience.
- The quality of on-site supervision you received from the preceptor and others at the site during your fieldwork. Was someone generally available to answer your questions and provide feedback? Discuss the usefulness and value of the feedback you received.
- Challenges or problems you encountered during the fieldwork and how they were addressed. What technical or human obstacles did you encounter? Were there any deviations from your original plan or expectations for the fieldwork (for better or worse!).
- The overall quality of the fieldwork. Were there particular skills, knowledge or lessons that you acquired unexpectedly? Explain. Was the fieldwork a good educational experience – why or why not? How did it provide you with a better sense of the skills needed for employment in the profession? Discuss recommendations for improving your fieldwork experience. Explain why you would or would not recommend that other students conduct fieldwork with the same department or agency.

CAPSTONE PROPOSAL OUTLINE

Capstone Paper Proposal - OUTLINE AND GUIDANCE

Proposed paper title:

Background:

Proposed paper topic:

In one or two sentences, describe the overall topic, or research question, to be addressed by this paper.

Briefly review the literature on the topic in a structured argument that justifies the analyses you are proposing to conduct or the paper you plan to write. What will your paper add to the literature currently available on this topic? This section should be no more than 2 pages (500 words) long and must include citations. The basis for this section may be your fieldwork literature review, enhanced by any other references.

Specific Aims or Hypotheses:

What are the questions that this paper will attempt to answer? The background section should lead the reader to see the importance of the questions you say you will answer n these aims. You should have a single hypothesis or no more than 4 aims.

Methods:

Briefly, describe the source of the information, experience, theoretical framework or data that you will be using in this paper. In the methods section you should include a casual diagram or logic model that can help guide your faculty advisor through your study design.

Data analysis Plan:

Describe your plans for data analysis in detail. Begin by defining how you will collect your information or if secondary sources are being used, describe them in detail. For qualitative data, describe coding methods, themes to be examined, etc. For quantitative data, describe the variables you will be using, how they will be recoded or categorized, how you will present the data (e.g. present odds ratios or rate ratios or betas) in your paper and the statistical tests you plan to use. For a systematic review or policy paper, describe the data bases to be consulted and the initial search terms, how you plan to organize the literature into subtopics or themes. Clearly describe inclusion and exclusion criteria for database searches. If you plan to use software for your analysis (e.g. NVIVO, Excel, SPSS, SAS), specify which programs you will use.

Citations:

The citations for the introduction section should be included here.

You must use reference management software (Refworks, Endnote, etc.) to put citations in your proposal and format the bibliography using the AJPH style.

PRECEPTOR EVALUATION INSTRUCTIONS

(Note: Each Specialization within CUNY GSPHHP has a Unique Form)

PUBLIC HEALTH NUTRITION

Fieldwork Preceptor Evaluation Form

Student: _____ Preceptor: _____

Name of Agency: _____ Dates of placement: _____to _____

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works					
b) Health education principles and concepts					
2. Skills in:					
a) Planning					
b) Implementation					
c) Organizing					
d) Program analysis and evaluation					
e) Writing					
f) Verbal communication					
g) Nutrition counseling/education					
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.					
2. Organizes and uses time effectively.					
3. Considers and incorporates the ideas of others					
4. Is able to facilitate work of committees and other groups.					
5. Submits accurate, well documented work and reports.					
6. Accepts responsibility and completes work assignments					
7. Raises innovative ideas and brings out creative and innovative ideas in others					

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:
2. Skills and knowledge needing further improvement:
3. Other comments:

Preceptor Signature_____ **Date**: _____

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

EPIDEMIOLOGY/BIOSTATISTICS

Fieldwork Preceptor Evaluation Form

Student: _____ Site Supervisor: _____

Name of Agency: _____ Dates of placement: _____

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No oppotunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of:					
a) Technical & political climate within which agency works					
b) Public health principles and concepts					
2. Skills in:					
a) Planning					
b) Implementation					
c) Organizing					
d) Program analysis and evaluation					
e) Writing					
f) Verbal communication					
g) Data manipulation/analysis					
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.					
2. Organizes and uses time effectively.					
3. Considers and incorporates the ideas of others					
4. Is able to facilitate work of committees and other groups.					
5. Submits accurate, well documented work and reports.					
6. Accepts responsibility and completes work assignments					
7. Raises innovative ideas and brings out creative and innovative ideas in others					

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:
2. Skills and knowledge needing further improvement:
3. Other comments:

Site Supervisor's Signature_____ **Date**: _____

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

HEALTH POLICY AND MANAGEMENT
Fieldwork Preceptor Evaluation Form

Student: _____ Preceptor: _____

Name of Agency: _____ Dates of placement: _____to _____

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works					
b) Health education principles and concepts					
2**. Skills in:**					
a) Assessment					
b) Evaluation					
c) Budgetary processes					
d) Policy implementation					
e) Writing					
f) Oral communication					
g) Collaborative team work					
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers					
2. Organizes and uses time effectively					
3. Listens attentively					
4. Facilitates work of program					
5. Submits accurate, well documented work and reports					
6. Accepts responsibility and completes work assignments					
7. Shows creativity or innovativeness					

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:

2. Skills and knowledge needing further improvement:

3. Other comments:

Preceptor Signature_____ **Date**: _____

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

Preceptor's Evaluation Form
Environmental and Occupational Health Sciences Program
CUNY Graduate School of Public Health and Health Policy

Student: _____ Site Supervisor: _____

Name of Organization: _____ Dates of placement: _____

	Please check one box in each row.				
	Excellent (performs on highly professional level)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. Appreciation and knowledge of: a) Technical & political climate within which organization works					
b) Environmental and occupational health principles and concepts					
c) Legal and regulatory environment					
2. Skills in: a) Planning					
b) Implementation					
c) Exposure assessment					
d) Program analysis and evaluation					
e) Written communication					
f) Verbal communication					
g) Data evaluation and analysis					
h) Training and education					
i) Hazard evaluation and abatement					
OVERALL PERFORMANCE					
1. Establishes friendly relationship with co-workers.					
2. Organizes and uses time effectively.					
3. Considers and incorporates the ideas of others					
4. Is able to facilitate work of committees and other groups.					
5. Submits accurate, well documented work and reports.					
6. Accepts responsibility and completes work assignments					
7. Raises innovative ideas and brings out creative and innovative ideas in others					

COMMENTS (Please respond briefly. Use reverse side if necessary):

1. Special strengths:

2. Skills and knowledge needing further improvement:

3. Other comments:

Site Supervisor's Signature_____ **Date**: _____

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

COMMUNITY HEALTH EDUCATION
Field Supervisor Evaluation Form

Student: _____ Site Supervisor: _____

Name of Agency: _____

Dates of Placement: _____

	Please check one box in each row.				
	Excellent (performs on a level that is highly professional)	**Above average**	**Average** (needs to improve)	**Below average**	No opportunity to observe
PROFESSIONAL QUALITIES					
1. **Appreciation and knowledge of:**					
a) Technical & political climate within which agency works					
b) Public health principles and concepts					
c) Best practices in field					
d) Ethical and social justice principles and standards					
2**. Skills in:**					
a) Assessment/planning					
b) Evaluation					
c) Budgetary processes					
d) Intervention or program development					
e) Written communication (appropriate to audience)					
f) Oral communication					
g) Collaborative engagement with diverse groups					
OVERALL PERFORMANCE					
1. Establishes collegial relationship with co-workers					
2. Organizes and uses time effectively					
3. Listens attentively					
4. Facilitates work of program					
5. Submits accurate, well documented work and reports					
6. Accepts responsibility and completes work assignments					
7. Shows creativity or innovativeness					

C. BRIEF COMMENTS

1. Special strengths:
2. Skills and knowledge needing further improvement:
3. Other comments:

Site Supervisor's Signature_____ Date: _____

You are encouraged to discuss this evaluation with the student. Kindly return the completed form to:

HEALTH CARE POLICY & ADMINISTRATION
Fieldwork Preceptor Evaluation Form

Supervisor's Name _____ Title_____

Agency _____

Phone _____ E-Mail _____

Address _____

Name of Fieldwork Student _____

Date of Evaluation_____

PART A - Please evaluate the student by checking the appropriate box..

FACTORS:	**Excellent**	**Very Good**	**Good**	**Fair**	**Poor**	**No opportunity to observe/does not apply**
Work performance						
1. Arrives on time consistently						
2. Uses time effectively						
4. Reliably completes tasks on time						
5. Effectiveness in written communication						
6. Effectiveness in oral communication						
7. Ability to identify problems and troubleshoot						
8. Overall quality of work produced						

Work attitudes						
FACTORS:	**Excellent**	**Very Good**	**Good**	**Fair**	**Poor**	**No opportunity to observe/does not apply**
1. Accepts responsibility						
2. Takes initiative						
3. Follows policies, rules, regulations of agency						
4. Accepts ideas and suggestions of others						
5. Performs tasks with industry and drive						

Professional relationships with:						
FACTORS:	**Excellent**	**Very Good**	**Good**	**Fair**	**Poor**	**No opportunity to observe/does**

						not apply
1. Professional staff						
2. Support staff						
3. Supervisor						
4. Personnel from other organizations						
5. Patients/ clients/participants						
6. General public						

Application of community health skills	**Excellent**	**Very Good**	**Good**	**Fair**	**Poor**	**No opportunity to observe/does not apply**
FACTORS:						
1 Assessing health problems						
2. Developing health objectives						
3. Planning health programs and projects						
4. Managing planned programs						
5. Evaluating program outcomes						
6. Developing budgets						
7. Applying research methodologies						
8. Compiling health data/statistics						
9. Facilitating group process						

Personal characteristics						
FACTORS:	**Excellent**	**Very Good**	**Good**	**Fair**	**Poor**	**No opportunity to observe/does not apply**
1. Dependability						
2. Tactfulness						
3. Listening ability						
4. Sensitivity						

PART B – Please rate the fieldwork student on his or her personal fieldwork objectives

Met Not Met

1.

2.

3.

4.

5.

PART C - Please answer as completely as possible. Use a separate sheet if necessary.

1. What are the outstanding strengths of the fieldwork student?
2. What are the areas needing improvement?
3. Other comments regarding the student.
4. **What is your overall assessment of this student?** (Circle appropriate letter)

A =Excellent; A-- =Very good; B+ or B = Good; B- = Fair; Below B- = Poor.

STUDENT EVALUATION OF FIELDWORK

Please provide an honest assessment of your internship experience

1. Student's name: _____

2. Title of project:_____

3. Date of this form: _____

4. Fieldwork start & completion dates:_____

5. Preceptor's name & title:_____

6. Agency name and address:_____

_____

7. Total number of hours completed:_____

8. Describe the primary duties for which you were responsible:_____

_____

_____

9. Overall, how would you rate your fieldwork experience?
Excellent Very good Good Fair Poor

10. Rate the level of guidance/mentoring you received from your preceptor:
Excellent Very good Good Fair Poor

11. Would you consider working for this agency after you graduate?
Yes No Not sure

12. Would you recommend this placement for other students? Why or why not?

_____

_____

13. Please provide a brief summary of the most important things you learned from your fieldwork experience:

_____

_____

14. How prepared do you think you are in the following areas as a result of your fieldwork? *Insert an X in the appropriate box for each competency.*

	Very well prepared	Well prepared	Adequately Prepared	Inadequately prepared	Not prepared	Not applicable to my project
Core public health competency						
Apply the core functions of public health practice (assessment, policy development, and assurance)						
Understand basic theories, concepts, models and methods from a range of core and related disciplines and apply them to the design of PH research, policy, and practice.						
Apply ethical and social justice principles and standards						
Interpret and apply the public health literature.						
Use basic statistical and informatics techniques						
Communicate public health information verbally and in writing						
Explain key social, behavioral, biomedical and environmental determinants of and inequities in health and disease across the lifespan in urban settings						
Design and evaluate interventions to prevent or control urban public health problems						
Collect, analyze and interpret public health data						
Collaboratively engage with diverse groups						
Describe the legal foundations of the US public health system and its interrelationships with other systems (e.g. health care, education, environmental protection)						
Use key planning constructs (e.g. values, vision, mission, goals, objectives and outcomes)						
Demonstrate knowledge of the context of public and private health care systems, institutions, actors, and environments in which health care and public health policy is made and health care is delivered.						

15. In the space below, please provide any additional comments or suggestions that would help improve the fieldwork experience. Use as much space as you need.

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	DPH	Community, Society, and Health	"I Have a Dream" Foundation	Thierry Cazeau, MSW
13-14	MPH	Community-based Public Health and Health Equity	181st Street UCC	Hector Reyes, MD, MBA
14-15	DPH	Epidemiology	Adelphi University	Heidi Jones, PhD, MPH
13-14	MPH	Health Policy and Management	Advanced Clinical Laboratory Solutions	Stan Grinberg, PhD
14-15	MPH	Community-based Public Health and Health Equity	Albert Einstein College of Medicine	David Lounsbury, PhD
13-14	MPH	Community-based Public Health and Health Equity	Albert Einstein College of Medicine	Jeffrey Pessin, PhD and Rajat Singh, MD, MB
14-15	MPH	General Public Health	Arthur Ashe Institute for Urban Health	Nicole Primus- Henry, MPA
13-14	MPH	Community-based Public Health and Health Equity	Bailey House	Regina R. Quattrochi, Esq
13-14	MPH	Community-based Public Health and Health Equity	Bellevue Hospital	Christopher Racine, MD, MPH
14-15	MPH	Health Policy and Management	Blacksmith Institute/Pure Earth	Petr Sharov, PhD
14-15	MS/MPH	Community Health Education	BOOM! Health	Bianca Lopez
14-15	MPH	Community-based Public Health and Health Equity	Bronx Community Health Network	Paul Meissner, MSPH
13-14	MPH	Community-based Public Health and Health Equity	Bronx-Lebanon Hospital Center	Jay E. Selman, MD
14-15	MPH	Health Care Policy and Administration	Brookdale University Hospital and Medical Center	Brooke Barber, MSW
13-14	MPH	Health Care Policy and Administration	Brookdale University Hospital and Medical Center	Estevan Garcia, MD
13-14	MPH	Health Care Policy and Administration	Brookdale University Hospital and Medical Center	Sarita Dhuper, PhD
14-15	MPH	Health Care Policy and Administration	Brookdale University Hospital and Medical Center	Wayne Gietz, MA
13-14	MPH	Health Care Policy and Administration	Brooklyn College Health Programs/Immunization Requirements Office	Dave Bryan, MA
14-15	MPH	Community Health Education	Brooklyn College/Capracare	Jean Grassman, PhD
13-14	MPH	Community Health Education	Bubble Foundation	Jennifer Solodar, BA
14-15	MPH	Community Health Education	California Department of Public Health	Erin Murray, MPH
13-14	MPH	General Public Health	CAMBA	Elise Koffler, MPH
14-15	MPH	General Public Health	CAMBA	Leonardo Cambar, MPH
14-15	MPH	Health Care Policy and Administration	CapraCare	Jean Pierre-Louis, MPH
14-15	MS/MPH	Community Health Education	CCNS Glenwood Senior Center	Christopher Ramos
14-15	MPH	Community Health Education	Center for Court Innovation	Sarah Fritsche, MSc
14-15	MPH	Environmental and Occupational Health Sciences	Central Park Conservancy	Sylvie Adam, MS
13-14	MPH	Community-based Public Health and Health Equity	Changin The Odds	Estelle M. Raboni, MPH MCHES

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
14-15	MPH	Community-based Public Health and Health Equity	Children's Hospital at Montefiore	Lindsay DuBois, MPH and Elizabeth Spurrel, LCSW, MPH
14-15	MPH	Community-based Public Health and Health Equity	Cicatelli Associates Inc	Alice Douglas, MPH
13-14 & 14-15	MPH	Nutrition	City Harvest	Lauren Kaufman, MPH
13-14	MPH	Community-based Public Health and Health Equity	Clinical Directors Netwok	Chamanara Khalida, MD, MPH
14-15	MPH	Nutrition	Columbia University	Wahida Karmally, DrPH
14-15	MS/MPH	Community Health Education	Columbia University, School of Nursing	Elaine Larson, RN, PhD
13-14	MS/MPH	Community Health Education	Columbia-Presbyterian Ambulatory Care Network Center for Community Health and Education	Janet Garth, MPH; Pamela Haller, MPH; and Rosemary Sullivan, MA, RN
14-15	MPH	Health Policy and Management	Community Service Society	Steffie Kinglake, MPH
14-15	MPH	Nutrition	Cornell University Cooperation Extension	Khin Mar Cho, PhD, MSc
14-15	DPH	Health Policy and Management	CUNY Academy Health	Alexis Pozen, PhD
13-14	MPH	Community-based Public Health and Health Equity	CUNY Graduate Center	Keville Frederickson, EdD, FAAN and Cidna Valentin, PhD
14-15	MPH	Health Policy and Management & Nutrition	CUNY Graduate Center/SPH	Sonia Gonzalez, MPH
14-15	MPH	Environmental and Occupational Health Sciences	CUNY Hunter	Jack Caravanos, PhD
13-14	MPH	Community-based Public Health and Health Equity	CUNY Institute for Health Equity	Marilyn Aguirre-Molina, MS, EdD
14-15	MPH	Epidemiology and Biostatistics	CUNY School of Public Health	Elizabeth Kelvin, PhD
14-15	MPH	Epidemiology and Biostatistics	CUNY School of Public Health	Heidi Jones, PhD, MPH
14-15	MPH	Epidemiology and Biostatistics	CUNY School of Public Health	Katarzyna Wyka, PhD
13-14	DPH	Community, Society, and Health	Department of Health and Mental Hygiene	Ann Lifflander, MD, MPH
13-14	MPH	Environmental and Occupational Health Sciences	Department of Health and Mental Hygiene	Courtney Drayer, MS
14-15	DPH	Epidemiology	Department of Health and Mental Hygiene	Amber Levanon Seligon, PhD
13-14	MPH	Health Policy and Management	Department of Health and Mental Hygiene	Cynthia Driver, DrPH, RN
14-15	MPH	Health Policy and Management	East Harlem Emergency Prepardeness Collaborative	Ann-Gel Palermo, DrPH
13-14	MPH	Environmental and Occupational Health Sciences	Eastern Queens Alliance	Barbara Brown, MA
13-14 & 14-15	MS/MPH	Community Health Education	Edwin Gould Services for Children and Families	Tonya Brown, MS/MPH
13-14	MPH	Community-based Public Health and Health Equity	Einstein Hospital	Barbara A. Levy, MPA
14-15	MPH	Community Health Education	Foundation for AIDS Research	Stefan Baral, PhD, MPH

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	MPH	Environmental and Occupational Health Sciences	Glenridge Medical Associates	Cumanda Angustia, MSN
13-14	MPH	Community Health Education	God's Love We Deliver	Lisa Zulling, MS, RDN
14-15	MPH	Nutrition	Harvest Home Farmer's Market	Maritza Owens, BBA
13-14	MPH	Health Policy and Management	Hastings Center	Nancy Berlinger, PhD
13-14	MS/MPH	Community Health Education	Health Disparities Center, NYU School of Medicine Translational Research Building	Leanne Lauressi, MPH and Gbenga Ogedegbe, MD, MPH
14-15	MPH	Nutrition	HealthClass 2.0	Lesley Rennis, MPH
14-15	MS/MPH	Community Health Education	HEAT Program/FACES Network, Downstate SUNY Medical Center	Jeffrey Birnbaum, MPH, MD
13-14	MPH	Health Care Policy and Administration	HELP/PSI	Leonardo Vincente, MPH
13-14	MPH	Health Policy and Management	HELP/PSI	Ndidi Iyare, MPH
14-15	MPH	Community Health Education	Heritage Foods USA	Erin Fairbanks, MA
13-14	MPH	Health Policy and Management	HITLAB	Diana Johnson, MA
13-14	MPH	Community Health Education	HIV Center for Clinical and Behavioral Studies	Patricia Warne, PhD
13-14	MPH	Community-based Public Health and Health Equity	HNS	Kimberly Libman, PhD, MPH
13-14	DPH	Epidemiology	Hofstra University	Corine Kyriyacu, PhD, MPH
13-14 & 14-15	MS/MPH	Community Health Education	Hospital for Special Surgery Public and Patient Education Department	Sandra Goldsmith, MS, RD
13-14	MS/MPH	Community Health Education	Housing Works, Inc	Annita Talor, BSN, RN and Josephine Akhigbe
13-14 & 14-15	MS/MPH	Community Health Education	Housing Works, Inc	Nadine Juste-Beckles, MSW, MPA and Josephine Akhigbe
13-14	MPH	Health Policy and Management	HSS	Patricia Quinlan, DnS
13-14	MPH	Community Health Education	Hunter College	May May Leung, PhD, RD
13-14	MPH	Environmental and Occupational Health Sciences	Hunter College and New York City Departement of Health and Mental Hygiene	Grace Sembajwe, ScD
14-15	MPH	Health Policy and Management	Hunter College School of Public Health	Jessie Daniels, PhD
14-15	MS/MPH	Community Health Education	Institute for Family Health	Elisa Wallman Jacques
14-15	MPH	Health Policy and Management	Institute for Family Health	Sara Baird, MD
14-15	MPH	Community Health Education	International Trauma Studies Program with consultancy at the International Resuce Committee	Jack Saul, PhD
14-15	DPH	Epidemiology	JackRabbit Sports	Lorna Thorpe, PhD, MPH
13-14	MPH	Community-based Public Health and Health Equity	Jacobi Medical Center/North Bronx Healthcare Network	Monica Tragrte
14-15	MPH	Community-based Public Health and Health Equity	Lehman College	Glen Johnson, PhD

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	MPH	Community-based Public Health and Health Equity	Lehman College/Health Sciences Dept	Mary Huynh, PhD
13-14 & 14-15	MS/MPH	Community Health Education	Lower Eastside Girls Club	Lyn Pentecost, PhD; Susan Luck, PhD, RN; and Samantha Waite, MA
13-14	MPH	Community Health Education	Maimonides Medical Center	Louise Valerio, MPA
13-14	MPH	Health Care Policy and Administration	Maimonides Medical Center	Shari Suchoff, MPP
13-14	DPH	Community, Society, and Health	Make the Road New York	Lorelei Salas, JD and Theo Oshiro
13-14	MPH	Community Health Education	Memorial Sloan Kettering Cancer Center	Mindy Sovel, DrPHc, MPH
14-15	MPH	Health Care Policy and Administration	Memorial Sloan Kettering Cancer Center	Denise Goodman, MBA
14-15	MPH	Health Care Policy and Administration	Memorial Sloan Kettering Cancer Center	Nicole Ruffini, MPH
13-14	MPH	Health Policy and Management	Memorial Sloan Kettering Cancer Center	Jean Jordan, MPA
13-14	MPH	Epidemiology and Biostatistics	Memorial Sloan Kettering Cancer Center, Immigrant Health and Cancer Disaparities	E. Zoe Schutzman, MA
14-15	MPH	Community-based Public Health and Health Equity	Montefiore Medical Center	Audrey Adams, MPH, RN, CIC
14-15	MPH	Community-based Public Health and Health Equity	Montefiore Medical Center	Viraj Patel, MD, MPH
14-15	MPH	Health Policy and Management	Montefiore Medical Center	Hope Glassberg, MPA
14-15	MPH	Community-based Public Health and Health Equity	Montefiore Medical Center	Thomas Aldrich, MD
14-15	MPH	Community-based Public Health and Health Equity	Montefiore Medical Hospital in the Community and Population Health	Nicole Joseph, MPH
14-15	MPH	Community-based Public Health and Health Equity	Morris Heights Health Center	Estelle Raboni, MPH
14-15	MPH	Community Health Education	Mount Sinai	Stephan Krieger, MD
14-15	DPH	Environmental and Occupational Health	Mount Sinai School of Medicine	Jean Grassman, PhD
13-14	MPH	Health Policy and Management	Mount Sinai School of Medicine, Department of Emergency Medicine	Ula Hwang, MD, MPH
14-15	DPH	Environmental and Occupational Health	N/A (assist with preparation of Dr. Geltman's testimony on emerging areas of phthalate research before the USEPA IRIS)	Elizabeth Geltman, LLM, JD
14-15	DPH	Environmental and Occupational Health	N/A (examine regulations to protect public from TENORM and generate evidence-based policy recommendations)	Elizabeth Geltman, LLM, JD
14-15	MPH	Epidemiology and Biostatistics	N/A (work with sponsor on data analysis)	Levi Waldron, PhD
14-15	MPH	Health Policy and Management	N/A (work with sponsor on data analysis)	Yi Han

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
14-15	MPH	Environmental and Health Sciences	N/A (work with sponsor on mold remediation certification)	Elizabeth Geltman, LLM, JD
14-15	MPH	Community Health Education	National Institute of Reproductive Health	Kathryn Albergate, MPH
13-14	MPH	Community-based Public Health and Health Equity	New York Academy of Medicine	Ana Garcia, MPA
14-15	MPH	Health Policy and Management	New York City Department of Education	Marcelo De Stefano, EdD
14-15	MPH	Environmental and Occupational Health Sciences	New York City Department of Environmental Protection	Carlstein Lutchmedial
13-14 & 14-15	MS/MPH	Community Health Education	New York City Department of Health and Mental Hygiene	Denise Paone, EdD and Hillary Kunins, MD, MPH
13-14	MPH	Community Health Education	New York City Department of Health and Mental Hygiene	Katherine Bartley, PhD
13-14	MS/MPH	Community Health Education	New York City Department of Health and Mental Hygiene	Marybec Griffin-Tomas, MPH; Allyna Steinberg, MPH; and Deborah Kaplan, DrPH
14-15	MPH	Community Health Education	New York City Department of Health and Mental Hygiene	Lorna Thorpe, PhD, MPH
13-14	MPH	Community-based Public Health and Health Equity	New York City Department of Health and Mental Hygiene	Nirah Johnson, LMSW
13-14	MPH	Epidemiology and Biostatistics	New York City Department of Health and Mental Hygiene	Hilary Parton, MPH
13-14	MPH	Epidemiology and Biostatistics	New York City Department of Health and Mental Hygiene	Philip Noyes, MPH, MA
13-14	MPH	General Public Health	New York City Department of Health and Mental Hygiene	Andrew Faciano, MPH
14-15	MPH	General Public Health	New York City Department of Health and Mental Hygiene	Sarah Wolf, MPH
14-15	MPH	Health Policy and Management	New York City Department of Health and Mental Hygiene	Emily Westheimer, MSc
14-15	MPH	Health Policy and Management	New York City Department of Health and Mental Hygiene	Rebecca Lee, MPH
14-15	MPH	Health Policy and Management	New York City Department of Health and Mental Hygiene	Tamar Renaud, MPH
13-14	DPH	Epidemiology	New York City Department of Health and Mental Hygiene, Bureau of Environmental Surveillance and Policy	Thomas Matte, MD, MPH and Wendy McKelvey, PhD
13-14	MS/MPH	Community Health Education	New York City Department of Health and Mental Hygiene, Bureau of HIV/AIDS Prevention and Control	Charu Sabharwal, MD and Adriana Andaluz, MPH

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	MS/MPH	Community Health Education	New York City Department of Health and Mental Hygiene, Bureau of Maternal Infant and Reproductive Health	Elisa Dunn; Roberta Holder-Mosley, MSN; and Deborah Kaplan, DrPH
14-15	MS/MPH	Environmental and Occupational Health Sciences	New York City Department of Health and Mental Hygiene, Bureau of Tuberculosis Control	Elvy Barroso, MS and Joseph Burzynski, MD
13-14	MPH	Environmental and Occupational Health Sciences	New York City Department of Transportation	Hector Hernandez, BS
14-15	MS/MPH	Community Health Education	New York City Food Policy Center	Ashley Rafalow, MPH, CPH
13-14 & 14-15	MPH	Community Health Education	New York City Food Policy Center	Diana Johnson, MA
13-14	MPH	Environmental and Occupational Health Sciences	New York City Housing Authority	Ajamu Brown
13-14	MPH	Environmental and Occupational Health Sciences	New York City Transit Authority	Bernard Jens, BS
13-14	DPH	Community, Society, and Health	New York Committee for Occupational Safety and Health	Maureen LaMar
13-14	MPH	Environmental and Occupational Health Sciences	New York Committee for Occupational Safety and Health	Joel Shufro, PhD
13-14	MS/MPH	Community Health Education	New York Presbyterian Ambulatory Care Network	Monica Hidalgo, MA; Deborah Acevedo; and Rosemary Sullivan, MA, RN
13-14	MPH	Community-based Public Health and Health Equity	New York Presbyterian Hospital	Brett Gray, ANP, MPH
13-14	MPH	Health Policy and Management	New York Presbyterian Hospital	Carolyn Halik, MPH
14-15	MPH	Nutrition	New York Presbyterian Hospital	Debra Katz, MPH, RD
14-15	MPH	Health Care Policy and Administration	New York Presbyterian Hospital Columbia University Medical Center	Emelin Martinez, BA
14-15	MPH	Health Care Policy and Administration	New York University School of Medicine, Center for Healthful Behavior Change	Leanne Lauressi, MPH
13-14	MPH	Health Policy and Management	North Shore LIJ	Christine Essig, MPA
13-14	MPH	Community Health Education	Northern Manhattan Perinatal Partnership, Inc. (NMPP)	Joyce Hall, MPH, CLC
14-15	MPH	Community-based Public Health and Health Equity	Northern Manhattan Perinatal Partnership, Inc. (NMPP)	Ekua Ansah-Samuels, MPH
14-15	MPH	Community Health Education	NYU Center for the Study of Asian American Health	Yousra Yusuf, MPH
13-14	MPH	Epidemiology and Biostatistics & Community Health Education	NYU School of Medicine	Maria Khan, PhD, MPH
13-14	MPH	Community-based Public Health and Health Equity	Phoenix House	Karen Mohammed LMCH, MSW
14-15	DPH	Health Policy and Management	Planned Parenthood	Alice Beger, RN, MPH

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	DPH	Community, Society, and Health	Population Council	Gina Duclayan
14-15	MPH	Nutrition	Princeton Farmers Market	Sherri Petonic
13-14	MPH	Environmental and Occupational Health Sciences	Private Consultant for NYC Department of Transportation	Haralambos Vasiliades, PhD
14-15	DPH	Environmental and Occupational Health	PSC Health & Safety Committee	Jean Grassman, PhD
13-14	MS/MPH	Community Health Education	Public Health Solutions	Corinna Lohser, MPH and Louise Cohen, MPH
13-14	MPH	Community-based Public Health and Health Equity	Public Health Solutions	Natalie Terens, MPH
14-15	MPH	Epidemiology and Biostatistics	Reproductive Health Education in Family Medicine (RHEDI)	Marji Gold, MD
14-15	MPH	Community-based Public Health and Health Equity	Ryan/Adair Community Health Center	Charles Shorter, MSW
13-14	MPH	Health Policy and Management	Sakhi	Shalini Somayaji, JD
13-14	MPH	Epidemiology and Biostatistics	Silberman School of Social Work, Hunter College	Marina Lalayants, PhD
14-15	MPH	Nutrition	Solomon Schechter School of Westchester	Meri Sirkin, MS, RN
13-14	MPH	Community Health Education	Soundshore Medical Center	Pamela Dupuis, MSN
13-14	MPH	Community-based Public Health and Health Equity	St. Barnabas Hospital	Arlene Ortiz-Allende
14-15	MPH	General Public Health	St. John's Episcopal Hospital	Margaret Cook
13-14	MPH	General Public Health	State University Of New York, Health Science Center (SUNY HSC) or Downstate Medical Center	Jaycinth Blackman, MA, BSN, RN, MBA, CPHQ
13-14	MPH	General Public Health	SUNY Downstate Brooklyn Health Disparities Center	Pamela Straker, PhD
14-15	MPH	General Public Health	SUNY Downstate Medical Center	Elizabeth Eastwood, PhD
13-14	MS/MPH	Community Health Education	The Bowery Mission	Katherine Kiesel and Matt Krivich
13-14 & 14-15	MS/MPH	Community Health Education & Environmental and Occupational Health Sciences	The Center for Comprehensive Health Practice	Jozefa Cheman, RN
13-14	MPH	Community Health Education	The Center for HIV Educational Studies and Training	Ethan Fusaris, MPH
13-14	MPH	Epidemiology and Biostatistics	The Children's Hospital at Montefiore	Marina Reznik, MD, MS
14-15	MPH	Epidemiology and Biostatistics	The Hunter HIV/AIDS Research Team	Sarit Golub, PhD, MPH
14-15	MPH	General Public Health	Union Plaza Care Center	Dr. Adina Pelman, PhD
13-14	MPH	Health Care Policy and Administration	United Community Centers	Myra Hellerstein, MPH
13-14	MPH	Community Health Education	University Behavioral Associates	Anita Jose, PhD

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
14-15	MPH	Community-based Public Health and Health Equity	Urban Health Plan, Inc	Maggie Rourk, MPH, RD, CDN
13-14	MPH	Community-based Public Health and Health Equity	Urban Health Plan, Inc	Nicole Scheutt-Lefkowitz, MPH
13-14	MS/MPH	Community Health Education	Visiting Nurse Services of New York	Coleen Cox-Ballah, DHA, RN
13-14	MS/MPH	Community Health Education	Visiting Nurse Services of New York	Helena Meiri, RN and Nancy Bohnarczyk, EdD
14-15	MPH	Community Health Education	Washington Heights Corner Project	Taeko Frost
13-14	MPH	Health Care Policy and Administration	Woodhull Medical and Mental Health Center	Joseph Martinez
13-14	MPH	Health Care Policy and Administration	Woodhull Medical and Mental Health Center	Rohan Ellis, MA

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	DPH	Community, Society, and Health	"I Have a Dream" Foundation	Thierry Cazeau, MSW
13-14	MPH	Community-based Public Health and Health Equity	181st Street UCC	Hector Reyes, MD, MBA
14-15	DPH	Epidemiology	Adelphi University	Heidi Jones, PhD, MPH
13-14	MPH	Health Policy and Management	Advanced Clinical Laboratory Solutions	Stan Grinberg, PhD
14-15	MPH	Community-based Public Health and Health Equity	Albert Einstein College of Medicine	David Lounsbury, PhD
13-14	MPH	Community-based Public Health and Health Equity	Albert Einstein College of Medicine	Jeffrey Pessin, PhD and Rajat Singh, MD, MB
14-15	MPH	General Public Health	Arthur Ashe Institute for Urban Health	Nicole Primus- Henry, MPA
13-14	MPH	Community-based Public Health and Health Equity	Bailey House	Regina R. Quattrochi, Esq
13-14	MPH	Community-based Public Health and Health Equity	Bellevue Hospital	Christopher Racine, MD, MPH
14-15	MPH	Health Policy and Management	Blacksmith Institute/Pure Earth	Petr Sharov, PhD
14-15	MS/MPH	Community Health Education	BOOM! Health	Bianca Lopez
14-15	MPH	Community-based Public Health and Health Equity	Bronx Community Health Network	Paul Meissner, MSPH
13-14	MPH	Community-based Public Health and Health Equity	Bronx-Lebanon Hospital Center	Jay E. Selman, MD
14-15	MPH	Health Care Policy and Administration	Brookdale University Hospital and Medical Center	Brooke Barber, MSW
13-14	MPH	Health Care Policy and Administration	Brookdale University Hospital and Medical Center	Estevan Garcia, MD
13-14	MPH	Health Care Policy and Administration	Brookdale University Hospital and Medical Center	Sarita Dhuper, PhD
14-15	MPH	Health Care Policy and Administration	Brookdale University Hospital and Medical Center	Wayne Gietz, MA
13-14	MPH	Health Care Policy and Administration	Brooklyn College Health Programs/Immunization Requirements Office	Dave Bryan, MA
14-15	MPH	Community Health Education	Brooklyn College/Capracare	Jean Grassman, PhD
13-14	MPH	Community Health Education	Bubble Foundation	Jennifer Solodar, BA
14-15	MPH	Community Health Education	California Department of Public Health	Erin Murray, MPH
13-14	MPH	General Public Health	CAMBA	Elise Koffler, MPH
14-15	MPH	General Public Health	CAMBA	Leonardo Cambar, MPH
14-15	MPH	Health Care Policy and Administration	CapraCare	Jean Pierre-Louis, MPH
14-15	MS/MPH	Community Health Education	CCNS Glenwood Senior Center	Christopher Ramos
14-15	MPH	Community Health Education	Center for Court Innovation	Sarah Fritsche, MSc
14-15	MPH	Environmental and Occupational Health Sciences	Central Park Conservancy	Sylvie Adam, MS
13-14	MPH	Community-based Public Health and Health Equity	Changin The Odds	Estelle M. Raboni, MPH MCHES

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
14-15	MPH	Community-based Public Health and Health Equity	Children's Hospital at Montefiore	Lindsay DuBois, MPH and Elizabeth Spurrel, LCSW, MPH
14-15	MPH	Community-based Public Health and Health Equity	Cicatelli Associates Inc	Alice Douglas, MPH
13-14 & 14-15	MPH	Nutrition	City Harvest	Lauren Kaufman, MPH
13-14	MPH	Community-based Public Health and Health Equity	Clinical Directors Netwok	Chamanara Khalida, MD, MPH
14-15	MPH	Nutrition	Columbia University	Wahida Karmally, DrPH
14-15	MS/MPH	Community Health Education	Columbia University, School of Nursing	Elaine Larson, RN, PhD
13-14	MS/MPH	Community Health Education	Columbia-Presbyterian Ambulatory Care Network Center for Community Health and Education	Janet Garth, MPH; Pamela Haller, MPH; and Rosemary Sullivan, MA, RN
14-15	MPH	Health Policy and Management	Community Service Society	Steffie Kinglake, MPH
14-15	MPH	Nutrition	Cornell University Cooperation Extension	Khin Mar Cho, PhD, MSc
14-15	DPH	Health Policy and Management	CUNY Academy Health	Alexis Pozen, PhD
13-14	MPH	Community-based Public Health and Health Equity	CUNY Graduate Center	Keville Frederickson, EdD, FAAN and Cidna Valentin, PhD
14-15	MPH	Health Policy and Management & Nutrition	CUNY Graduate Center/SPH	Sonia Gonzalez, MPH
14-15	MPH	Environmental and Occupational Health Sciences	CUNY Hunter	Jack Caravanos, PhD
13-14	MPH	Community-based Public Health and Health Equity	CUNY Institute for Health Equity	Marilyn Aguirre-Molina, MS, EdD
14-15	MPH	Epidemiology and Biostatistics	CUNY School of Public Health	Elizabeth Kelvin, PhD
14-15	MPH	Epidemiology and Biostatistics	CUNY School of Public Health	Heidi Jones, PhD, MPH
14-15	MPH	Epidemiology and Biostatistics	CUNY School of Public Health	Katarzyna Wyka, PhD
13-14	DPH	Community, Society, and Health	Department of Health and Mental Hygiene	Ann Lifflander, MD, MPH
13-14	MPH	Environmental and Occupational Health Sciences	Department of Health and Mental Hygiene	Courtney Drayer, MS
14-15	DPH	Epidemiology	Department of Health and Mental Hygiene	Amber Levanon Seligon, PhD
13-14	MPH	Health Policy and Management	Department of Health and Mental Hygiene	Cynthia Driver, DrPH, RN
14-15	MPH	Health Policy and Management	East Harlem Emergency Prepardeness Collaborative	Ann-Gel Palermo, DrPH
13-14	MPH	Environmental and Occupational Health Sciences	Eastern Queens Alliance	Barbara Brown, MA
13-14 & 14-15	MS/MPH	Community Health Education	Edwin Gould Services for Children and Families	Tonya Brown, MS/MPH
13-14	MPH	Community-based Public Health and Health Equity	Einstein Hospital	Barbara A. Levy, MPA
14-15	MPH	Community Health Education	Foundation for AIDS Research	Stefan Baral, PhD, MPH

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	MPH	Environmental and Occupational Health Sciences	Glenridge Medical Associates	Cumanda Angustia, MSN
13-14	MPH	Community Health Education	God's Love We Deliver	Lisa Zulling, MS, RDN
14-15	MPH	Nutrition	Harvest Home Farmer's Market	Maritza Owens, BBA
13-14	MPH	Health Policy and Management	Hastings Center	Nancy Berlinger, PhD
13-14	MS/MPH	Community Health Education	Health Disparities Center, NYU School of Medicine Translational Research Building	Leanne Lauressi, MPH and Gbenga Ogedegbe, MD, MPH
14-15	MPH	Nutrition	HealthClass 2.0	Lesley Rennis, MPH
14-15	MS/MPH	Community Health Education	HEAT Program/FACES Network, Downstate SUNY Medical Center	Jeffrey Birnbaum, MPH, MD
13-14	MPH	Health Care Policy and Administration	HELP/PSI	Leonardo Vincente, MPH
13-14	MPH	Health Policy and Management	HELP/PSI	Ndidi Iyare, MPH
14-15	MPH	Community Health Education	Heritage Foods USA	Erin Fairbanks, MA
13-14	MPH	Health Policy and Management	HITLAB	Diana Johnson, MA
13-14	MPH	Community Health Education	HIV Center for Clinical and Behavioral Studies	Patricia Warne, PhD
13-14	MPH	Community-based Public Health and Health Equity	HNS	Kimberly Libman, PhD, MPH
13-14	DPH	Epidemiology	Hofstra University	Corine Kyriyacu, PhD, MPH
13-14 & 14-15	MS/MPH	Community Health Education	Hospital for Special Surgery Public and Patient Education Department	Sandra Goldsmith, MS, RD
13-14	MS/MPH	Community Health Education	Housing Works, Inc	Annita Talor, BSN, RN and Josephine Akhigbe
13-14 & 14-15	MS/MPH	Community Health Education	Housing Works, Inc	Nadine Juste-Beckles, MSW, MPA and Josephine Akhigbe
13-14	MPH	Health Policy and Management	HSS	Patricia Quinlan, DnS
13-14	MPH	Community Health Education	Hunter College	May May Leung, PhD, RD
13-14	MPH	Environmental and Occupational Health Sciences	Hunter College and New York City Departement of Health and Mental Hygiene	Grace Sembajwe, ScD
14-15	MPH	Health Policy and Management	Hunter College School of Public Health	Jessie Daniels, PhD
14-15	MS/MPH	Community Health Education	Institute for Family Health	Elisa Wallman Jacques
14-15	MPH	Health Policy and Management	Institute for Family Health	Sara Baird, MD
14-15	MPH	Community Health Education	International Trauma Studies Program with consultancy at the International Resuce Committee	Jack Saul, PhD
14-15	DPH	Epidemiology	JackRabbit Sports	Lorna Thorpe, PhD, MPH
13-14	MPH	Community-based Public Health and Health Equity	Jacobi Medical Center/North Bronx Healthcare Network	Monica Tragrte
14-15	MPH	Community-based Public Health and Health Equity	Lehman College	Glen Johnson, PhD

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	MPH	Community-based Public Health and Health Equity	Lehman College/Health Sciences Dept	Mary Huynh, PhD
13-14 & 14-15	MS/MPH	Community Health Education	Lower Eastside Girls Club	Lyn Pentecost, PhD; Susan Luck, PhD, RN; and Samantha Waite, MA
13-14	MPH	Community Health Education	Maimonides Medical Center	Louise Valerio, MPA
13-14	MPH	Health Care Policy and Administration	Maimonides Medical Center	Shari Suchoff, MPP
13-14	DPH	Community, Society, and Health	Make the Road New York	Lorelei Salas, JD and Theo Oshiro
13-14	MPH	Community Health Education	Memorial Sloan Kettering Cancer Center	Mindy Sovel, DrPHc, MPH
14-15	MPH	Health Care Policy and Administration	Memorial Sloan Kettering Cancer Center	Denise Goodman, MBA
14-15	MPH	Health Care Policy and Administration	Memorial Sloan Kettering Cancer Center	Nicole Ruffini, MPH
13-14	MPH	Health Policy and Management	Memorial Sloan Kettering Cancer Center	Jean Jordan, MPA
13-14	MPH	Epidemiology and Biostatistics	Memorial Sloan Kettering Cancer Center, Immigrant Health and Cancer Disaparities	E. Zoe Schutzman, MA
14-15	MPH	Community-based Public Health and Health Equity	Montefiore Medical Center	Audrey Adams, MPH, RN, CIC
14-15	MPH	Community-based Public Health and Health Equity	Montefiore Medical Center	Viraj Patel, MD, MPH
14-15	MPH	Health Policy and Management	Montefiore Medical Center	Hope Glassberg, MPA
14-15	MPH	Community-based Public Health and Health Equity	Montefiore Medical Center	Thomas Aldrich, MD
14-15	MPH	Community-based Public Health and Health Equity	Montefiore Medical Hospital in the Community and Population Health	Nicole Joseph, MPH
14-15	MPH	Community-based Public Health and Health Equity	Morris Heights Health Center	Estelle Raboni, MPH
14-15	MPH	Community Health Education	Mount Sinai	Stephan Krieger, MD
14-15	DPH	Environmental and Occupational Health	Mount Sinai School of Medicine	Jean Grassman, PhD
13-14	MPH	Health Policy and Management	Mount Sinai School of Medicine, Department of Emergency Medicine	Ula Hwang, MD, MPH
14-15	DPH	Environmental and Occupational Health	N/A (assist with preparation of Dr. Geltman's testimony on emerging areas of phthalate research before the USEPA IRIS)	Elizabeth Geltman, LLM, JD
14-15	DPH	Environmental and Occupational Health	N/A (examine regulations to protect public from TENORM and generate evidence-based policy recommendations)	Elizabeth Geltman, LLM, JD
14-15	MPH	Epidemiology and Biostatistics	N/A (work with sponsor on data analysis)	Levi Waldron, PhD
14-15	MPH	Health Policy and Management	N/A (work with sponsor on data analysis)	Yi Han

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
14-15	MPH	Environmental and Health Sciences	N/A (work with sponsor on mold remediation certification)	Elizabeth Geltman, LLM, JD
14-15	MPH	Community Health Education	National Institute of Reproductive Health	Kathryn Albergate, MPH
13-14	MPH	Community-based Public Health and Health Equity	New York Academy of Medicine	Ana Garcia, MPA
14-15	MPH	Health Policy and Management	New York City Department of Education	Marcelo De Stefano, EdD
14-15	MPH	Environmental and Occupational Health Sciences	New York City Department of Environmental Protection	Carlstein Lutchmedial
13-14 & 14-15	MS/MPH	Community Health Education	New York City Department of Health and Mental Hygiene	Denise Paone, EdD and Hillary Kunins, MD, MPH
13-14	MPH	Community Health Education	New York City Department of Health and Mental Hygiene	Katherine Bartley, PhD
13-14	MS/MPH	Community Health Education	New York City Department of Health and Mental Hygiene	Marybec Griffin-Tomas, MPH; Allyna Steinberg, MPH; and Deborah Kaplan, DrPH
14-15	MPH	Community Health Education	New York City Department of Health and Mental Hygiene	Lorna Thorpe, PhD, MPH
13-14	MPH	Community-based Public Health and Health Equity	New York City Department of Health and Mental Hygiene	Nirah Johnson, LMSW
13-14	MPH	Epidemiology and Biostatistics	New York City Department of Health and Mental Hygiene	Hilary Parton, MPH
13-14	MPH	Epidemiology and Biostatistics	New York City Department of Health and Mental Hygiene	Philip Noyes, MPH, MA
13-14	MPH	General Public Health	New York City Department of Health and Mental Hygiene	Andrew Faciano, MPH
14-15	MPH	General Public Health	New York City Department of Health and Mental Hygiene	Sarah Wolf, MPH
14-15	MPH	Health Policy and Management	New York City Department of Health and Mental Hygiene	Emily Westheimer, MSc
14-15	MPH	Health Policy and Management	New York City Department of Health and Mental Hygiene	Rebecca Lee, MPH
14-15	MPH	Health Policy and Management	New York City Department of Health and Mental Hygiene	Tamar Renaud, MPH
13-14	DPH	Epidemiology	New York City Department of Health and Mental Hygiene, Bureau of Environmental Surveillance and Policy	Thomas Matte, MD, MPH and Wendy McKelvey, PhD
13-14	MS/MPH	Community Health Education	New York City Department of Health and Mental Hygiene, Bureau of HIV/AIDS Prevention and Control	Charu Sabharwal, MD and Adriana Andaluz, MPH

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	MS/MPH	Community Health Education	New York City Department of Health and Mental Hygiene, Bureau of Maternal Infant and Reproductive Health	Elisa Dunn; Roberta Holder-Mosley, MSN; and Deborah Kaplan, DrPH
14-15	MS/MPH	Environmental and Occupational Health Sciences	New York City Department of Health and Mental Hygiene, Bureau of Tuberculosis Control	Elvy Barroso, MS and Joseph Burzynski, MD
13-14	MPH	Environmental and Occupational Health Sciences	New York City Department of Transportation	Hector Hernandez, BS
14-15	MS/MPH	Community Health Education	New York City Food Policy Center	Ashley Rafalow, MPH, CPH
13-14 & 14-15	MPH	Community Health Education	New York City Food Policy Center	Diana Johnson, MA
13-14	MPH	Environmental and Occupational Health Sciences	New York City Housing Authority	Ajamu Brown
13-14	MPH	Environmental and Occupational Health Sciences	New York City Transit Authority	Bernard Jens, BS
13-14	DPH	Community, Society, and Health	New York Committee for Occupational Safety and Health	Maureen LaMar
13-14	MPH	Environmental and Occupational Health Sciences	New York Committee for Occupational Safety and Health	Joel Shufro, PhD
13-14	MS/MPH	Community Health Education	New York Presbyterian Ambulatory Care Network	Monica Hidalgo, MA; Deborah Acevedo; and Rosemary Sullivan, MA, RN
13-14	MPH	Community-based Public Health and Health Equity	New York Presbyterian Hospital	Brett Gray, ANP, MPH
13-14	MPH	Health Policy and Management	New York Presbyterian Hospital	Carolyn Halik, MPH
14-15	MPH	Nutrition	New York Presbyterian Hospital	Debra Katz, MPH, RD
14-15	MPH	Health Care Policy and Administration	New York Presbyterian Hospital Columbia University Medical Center	Emelin Martinez, BA
14-15	MPH	Health Care Policy and Administration	New York University School of Medicine, Center for Healthful Behavior Change	Leanne Lauressi, MPH
13-14	MPH	Health Policy and Management	North Shore LIJ	Christine Essig, MPA
13-14	MPH	Community Health Education	Northern Manhattan Perinatal Partnership, Inc. (NMPP)	Joyce Hall, MPH, CLC
14-15	MPH	Community-based Public Health and Health Equity	Northern Manhattan Perinatal Partnership, Inc. (NMPP)	Ekua Ansah-Samuels, MPH
14-15	MPH	Community Health Education	NYU Center for the Study of Asian American Health	Yousra Yusuf, MPH
13-14	MPH	Epidemiology and Biostatistics & Community Health Education	NYU School of Medicine	Maria Khan, PhD, MPH
13-14	MPH	Community-based Public Health and Health Equity	Phoenix House	Karen Mohammed LMCH, MSW
14-15	DPH	Health Policy and Management	Planned Parenthood	Alice Beger, RN, MPH

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
13-14	DPH	Community, Society, and Health	Population Council	Gina Duclayan
14-15	MPH	Nutrition	Princeton Farmers Market	Sherri Petonic
13-14	MPH	Environmental and Occupational Health Sciences	Private Consultant for NYC Department of Transportation	Haralambos Vasiliades, PhD
14-15	DPH	Environmental and Occupational Health	PSC Health & Safety Committee	Jean Grassman, PhD
13-14	MS/MPH	Community Health Education	Public Health Solutions	Corinna Lohser, MPH and Louise Cohen, MPH
13-14	MPH	Community-based Public Health and Health Equity	Public Health Solutions	Natalie Terens, MPH
14-15	MPH	Epidemiology and Biostatistics	Reproductive Health Education in Family Medicine (RHEDI)	Marji Gold, MD
14-15	MPH	Community-based Public Health and Health Equity	Ryan/Adair Community Health Center	Charles Shorter, MSW
13-14	MPH	Health Policy and Management	Sakhi	Shalini Somayaji, JD
13-14	MPH	Epidemiology and Biostatistics	Silberman School of Social Work, Hunter College	Marina Lalayants, PhD
14-15	MPH	Nutrition	Solomon Schechter School of Westchester	Meri Sirkin, MS, RN
13-14	MPH	Community Health Education	Soundshore Medical Center	Pamela Dupuis, MSN
13-14	MPH	Community-based Public Health and Health Equity	St. Barnabas Hospital	Arlene Ortiz-Allende
14-15	MPH	General Public Health	St. John's Episcopal Hospital	Margaret Cook
13-14	MPH	General Public Health	State University Of New York, Health Science Center (SUNY HSC) or Downstate Medical Center	Jaycinth Blackman, MA, BSN, RN, MBA, CPHQ
13-14	MPH	General Public Health	SUNY Downstate Brooklyn Health Disparities Center	Pamela Straker, PhD
14-15	MPH	General Public Health	SUNY Downstate Medical Center	Elizabeth Eastwood, PhD
13-14	MS/MPH	Community Health Education	The Bowery Mission	Katherine Kiesel and Matt Krivich
13-14 & 14-15	MS/MPH	Community Health Education & Environmental and Occupational Health Sciences	The Center for Comprehensive Health Practice	Jozefa Cheman, RN
13-14	MPH	Community Health Education	The Center for HIV Educational Studies and Training	Ethan Fusaris, MPH
13-14	MPH	Epidemiology and Biostatistics	The Children's Hospital at Montefiore	Marina Reznik, MD, MS
14-15	MPH	Epidemiology and Biostatistics	The Hunter HIV/AIDS Research Team	Sarit Golub, PhD, MPH
14-15	MPH	General Public Health	Union Plaza Care Center	Dr. Adina Pelman, PhD
13-14	MPH	Health Care Policy and Administration	United Community Centers	Myra Hellerstein, MPH
13-14	MPH	Community Health Education	University Behavioral Associates	Anita Jose, PhD

Table 2.4.b.1: Agencies and Preceptors Used for Practice Experiences by Students, 2013-2014 & 2014-2015				
Year	**Degree**	**Program Area**	**Agency**	**Preceptor Name**
14-15	MPH	Community-based Public Health and Health Equity	Urban Health Plan, Inc	Maggie Rourk, MPH, RD, CDN
13-14	MPH	Community-based Public Health and Health Equity	Urban Health Plan, Inc	Nicole Scheutt-Lefkowitz, MPH
13-14	MS/MPH	Community Health Education	Visiting Nurse Services of New York	Coleen Cox-Ballah, DHA, RN
13-14	MS/MPH	Community Health Education	Visiting Nurse Services of New York	Helena Meiri, RN and Nancy Bohnarczyk, EdD
14-15	MPH	Community Health Education	Washington Heights Corner Project	Taeko Frost
13-14	MPH	Health Care Policy and Administration	Woodhull Medical and Mental Health Center	Joseph Martinez
13-14	MPH	Health Care Policy and Administration	Woodhull Medical and Mental Health Center	Rohan Ellis, MA

Assessing the Impact of Restrictions to Medicaid Coverage of Methadone and Buprenorphine on Opioid Users' Access to and Utilization of Substance Use Treatment

by

A dissertation submitted to the Graduate Faculty in Public Health in partial fulfillment of the requirements for the degree of Doctor of Public Health, The City University of New York

2015

2015

All Rights Reserved **This manuscript has been read and accepted for the Graduate Faculty in Public Health in satisfaction of the dissertation requirement for the degree of Doctor of Public Health**

Dr. Nicholas Freudenberg

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Date Chair of Examining Committee

Dr. Denis Nash

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Date Executive Officer

Dr. William T. Gallo

Dr. Nancy Sohler Dr. Jonathan Prince

Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK

Abstract

Assessing the Impact of Restrictions to Medicaid Coverage of Methadone and Buprenorphine on Opioid Users' Access to and Utilization of Substance Use Treatment

by

Adviser: Professor William T. Gallo

Opioid use and dependence have increased dramatically since the early 2000s. As of 2013, an estimated 2.4 million people were considered to be dependent on opioids. Medication assisted treatment (MAT), such as methadone and buprenorphine, is the most effective form of treatment for opioid dependence; yet, since 2002, MAT use has decreased steadily.

Medicaid is the largest purchaser of MAT in the United States; however, Medicaid coverage of MAT varies by state. As of 2008, fourteen states did not cover either methadone or buprenorphine, or both. This dissertation examines the factors associated with Medicaid coverage of methadone and buprenorphine, and explores the impact of this coverage on the length of time individuals waited to enter substance use treatment, and the extent to which Medicaid coverage of methadone is associated with MAT utilization.

This dissertation utilized a combination of individual-level, program-level and state-level data. Individual-level data came from the Treatment Episodes Data Set-Admissions (TEDS-A). Program-level data were obtained from the Uniform Facility Data Set (UFDS) and the National Survey of Substance Abuse Treatment Services (N-SSATS). State-level data regarding Medicaid coverage of MAT were obtained from three sources: (1) McCarty et al's study, "Methadone Maintenance and State Medicaid Managed Care Programs"; (2) Ducharme at al's study, "State policy influence on the early diffusion of buprenorphine in community treatment programs"; and, (3) the State Financing for Medication Assisted Treatment study.

The main findings of this study indicate that state wealth is correlated with Medicaid coverage of MAT, Medicaid coverage of MAT is associated with an increase in treatment wait time and Medicaid coverage of methadone is associated with greater odds of MAT use. This dissertation did not include any analyses since the passage of the Patient Protection and Affordable Care Act (PPACA), which in 2014, required that all public and private health insurance programs cover substance use treatment services. While this prioritization will undoubtedly increase access to substance use treatment, not all services must be covered. Given this, variability in the accessibility of treatment will likely persist. Further research should continue to monitor the accessibility and utilization of substance use treatment, with particular focus on MAT.

Acknowledgements

I would like to express my appreciation to those individuals that have helped make this dissertation possible.

I am immensely grateful to Drs. William T. Gallo and Nancy Sohler for their guidance and support throughout my graduate studies. Their encouragement has allowed me to grow and their humor and patience have kept me sane. I would also like to thank Drs. Nicholas Fruedenberg and Jonathan Prince for their time, attention and support throughout the conception and writing of this dissertation.

To my family, NAMES REDACTED, my love and gratitude for each of you is endless. Your constant support and expressions of admiration kept me going through the most difficult periods of this program and dissertation. I look forward to having more time to relax, laugh and hug you all!

To my Mom, Dad and brother, NAME REDACTED, thank you for always being there, for always believing in me and for always being proud of me. Your support has been essential and your love has been a gift.

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Chapter 1: Introduction and Objectives

Dependence on opioids, including heroin and prescription pain relievers, has increased significantly in the United States over the last decade.[1] Between 2002 and 2013, the number of individuals considered to be opioid dependent grew 41% from approximately 1.7 million to 2.4 million people.[2,3] As opioid dependence has increased, so has the utilization of substance use treatment services. Between 2002 and 2012, the proportion of admission to substance use treatment programs for individuals reporting opioid use increased from 18% to 26%.[1]

Broadly speaking, there are two types of treatment for opioid dependence: (1) drug-free inpatient/outpatient, which includes inpatient hospitalization and rehabilitation programs, as well as outpatient programs such as 12-step programs; and, (2) medication assisted treatment (MAT), which included methadone and buprenorphine. MAT is the most effective form of substance use treatment for opioid dependence.[4,5] MAT, such as methadone and buprenorphine, suppresses the analgesic effect that opioids produce, as well as reduces withdrawal symptoms associated with opioid dependence.[6] Despite evidence supporting MAT as the most effective form of treatment for opioid dependence, only 28% of heroin dependent individuals and 18% of other opioid dependent individuals used MAT in 2012.[1]
In the United States, Medicaid beneficiaries represent the largest group of opioid dependent individuals, and Medicaid is the largest purchaser of buprenorphine and methadone.[7,8] As a result, Medicaid coverage of opioid treatment services has the potential to impact a large proportion of individuals with opioid dependence in the United States. As a combined state/federal program, state Medicaid programs have significant latitude in determining coverage for optional benefits, including some types of substance use treatment. As a result, Medicaid coverage of substance use treatment services varies significantly by state. For MAT, state variability ranges from full, unrestricted coverage, to partial coverage which includes restrictions such as pre-authorization requirements or lifetime limits on MAT use, and in some states, neither methadone nor buprenorphine are covered at all.[9]

This study seeks to gain a better understanding of the factors that influence Medicaid coverage of MAT, and whether coverage of MAT is associated with increased access to methadone and buprenorphine treatment. To understand the factors that influence Medicaid coverage of MAT, I examine two main categories of predictors: economic and need factors. Examples of economic factors include: state Federal Medical Assistance Percentages (FMAP) rate, percent of total residents that are Medicaid beneficiaries, per capita income, state expenditures, and the amount of funding that is received through federal block grants for substance use treatment services. Need factors include the number of substance use treatment facilities and the number of opioid dependent individuals in each state.

To gain a better understanding of the relationship between Medicaid coverage of MAT and the accessibility of substance use treatment for opioid dependent individuals, I examine the associations between Medicaid coverage of methadone and buprenorphine and the amount of time individuals seeking treatment are required to wait prior to treatment entry, as well as Medicaid coverage of methadone and MAT utilization.

Dissertation Specific Aims

The specific aims for this dissertation project are:

Aim 1: Identify state-level factors that are correlated with Medicaid coverage of methadone and buprenorphine

Aim 1a:

Assess whether state-level economic factors such as Federal Medical Assistance Percentages (FMAP), percent of total residents that are Medicaid beneficiaries, per capita income, and

amount of funding received through federal block grants for substance use treatment services are correlated with Medicaid coverage of methadone and buprenorphine.

Aim 1b:

Assess whether the need for opioid treatment, measured by the number of substance use treatment facilities and the number of opioid dependent individuals, is correlated with Medicaid coverage of methadone and buprenorphine.

Aim 2: Determine whether individuals enrolled in substance use treatment in states with Medicaid coverage of methadone or buprenorphine experience decreased wait times for substance use treatment entry, as compared with individuals enrolled in substance use treatment in states with no Medicaid coverage of methadone or buprenorphine.

Aim 3: Determine whether opioid dependent individuals seeking substance use treatment in states with Medicaid coverage of methadone are more likely to utilize medication assisted treatment, as compared to opioid dependent individuals seeking substance use treatment in states without Medicaid coverage of methadone.

Dissertation Overview

The following paragraph provides an overview of the chapters included in this dissertation.

In Chapter 2, Background and Significance, I provide a review of the literature related to each study aim. I also include an overview of the public health burden of opioid dependence, current treatments for opioid dependence and Medicaid coverage of MAT. In Chapter 3, Data and Measures, I describe the data sources used in each aim of this study, the methods for creating the analytic samples and the methods used to handle missing data. In Chapter 4, I review the theoretical framework used to guide the construction of Aim 1 and the addition of state-level predictor variables utilized in Aims 2 and 3. In Chapters 5, 6 and 7, I describe the findings from each of the three analyses. Finally, in Chapter 8, I review

the limitations of the study, synthesize the findings across study aims and discuss the relevance of these findings within the policy context of current day Medicaid coverage of substance use treatment in the United States.

Chapter 2: Background and Significance

This dissertation has two primary objectives: (1) to understand the factors associated with state Medicaid coverage of methadone and buprenorphine, the primary medications used to treat opioid dependent individuals; and, (2) to demonstrate the impact of this coverage on the accessibility of substance use treatment. To achieve this, three separate analyses have been conducted. The first analysis, described in greater detail in Chapter 5, examines the association between state-level factors representing the economic situation of the state and the need for treatment within a state, and Medicaid coverage of methadone and buprenorphine. The remaining two analyses focuses on understanding the impact of Medicaid coverage of methadone and buprenorphine on individuals seeking substance use treatment. The first of these two analyses, described in detail in Chapter 6, investigates the association between Medicaid coverage of methadone and buprenorphine (examined separately) and the amount of time individuals wait to enter substance use treatment. The second analysis, detailed in Chapter 7, explores the association between Medicaid coverage of methadone and the utilization of MAT.

This chapter provides an overview of the literature related to these analyses, including the public health significance of opioid dependence in the United States, a review of treatment for opioid dependence, with a detailed description of MAT, and a review of the current literature regarding utilization of MAT in the United States.

Public Health Burden of Opioid Dependence

Opioid dependence, whether the result of nonmedical use of prescription opioids such as

Oxycodone and Hydrocodone, or heroin use, poses a significant public health problem in the United States as it has been linked to drug overdose, polydrug use, sexual risk behaviors for HIV and other infectious diseases, and injection drug use.[10–15] In 2013, 4.5 million Americans reported nonmedical use of prescription opioids within the previous twelve months, the second most frequently used illicit drug category behind marijuana.[16]

While nonmedical use of prescription opioids remains significant, recent trend data indicate that it is decreasing in the United States.[16] Heroin use, however, has been steadily increasing.[17–20] Between 2007 and 2013, there was a consistent increase in heroin use (within the past year) among persons 12 years or older.[16] Evidence suggests that the concurrent increase in heroin use and decrease in nonmedical prescription opioid use is the result of two factors: changes to the formulation of prescription opioids that made it more difficult to crush, and therefore inject and/or inhale prescription opioids, and the transition from nonmedical prescription opioid use to heroin use among prescription opioid dependent individuals.[21–23] Similar to prescription opioids, heroin dependence has significant health consequences, including HIV and hepatitis C infection, drug overdose, injection drug use, bacterial and soft tissue infections such as endocarditis and cellulitis, as well as unsafe sex and drug behaviors.[24–31]

Opioid dependence, whether the result of prescription opioid or heroin use, carries a significant monetary cost. Health care costs associated with opioid dependence are considerable, at approximately $25 billion, and the overall societal costs due to opioid dependence, including health care costs, incarceration and workplace costs such as lost employment, are estimated at $55.7 billion.[32]

Treatment for Opioid Dependence

The increase in heroin use and continued high rate of nonmedical use of opioids in the United States has resulted in a substantial increase in the use of substance use treatment. Between 2002 and 2013, the number of individuals seeking treatment for heroin increased from 277,000 to 526,000 and from

360,000 to 746,000 for prescription opioid users.[16]

Broadly speaking, there are two main categories of treatment currently available for opioid dependence: drug-free inpatient/outpatient treatment, which includes inpatient therapeutic communities and outpatient support groups (primarily focused on abstinence); and medication-assisted treatment (MAT), which includes methadone, buprenorphine and naltrexone. Of these forms of treatment, methadone and buprenorphine are the most effective approach to treating opioid addiction. These two treatments are the focus of this dissertation.[4,5]

Medication Assisted Treatment

Opioids stimulate feelings of euphoria, drowsiness and decreased anxiety by binding to and activating opioid receptors in the body.[33] Medications used to treat opioid dependence are classified by their effect on these receptors. Opioid agonists, such as heroin, codeine and methadone, both bind to and activate these receptors, allowing users to experience feelings of euphoria.[33] Opioid antagonists such as naloxone also bind to these receptors, but they block the euphoric effects of these drugs, and have the potential to reverse the effects altogether.[34] Naloxone, for example, is used to reverse opioid overdoses by removing opioid agonists from these receptor sites, effectively putting the patient in a state of withdrawal. Finally, between the categories of agonists and antagonists are partial agonists, such as buprenorphine. Partial opioid agonists bind to opioid receptors, providing some agonist effects but these effects are limited by the antagonist properties.[34]

Methadone and buprenorphine are particularly effective at suppressing withdrawal symptoms, due to their agonist properties, while simultaneously creating blocking effects for other opioids, such as heroin.[35] These medications create a tolerance to opioids which, over time, lessens the effect of other opioids.[36] This quality is an important benefit for the treatment of opioid dependence because it can reduce the likelihood of sustained or increased use of other opioids.

Methadone and buprenorphine have long half-lives, or lasting effects, making them ideal for the treatment of opioid dependence. Heroin has a half-life of approximately two to three hours, at which point opioid receptors begin to empty and the user begins to feel symptoms of withdrawal. In contrast, the half-life of methadone ranges from 16-48 hours and approximately 24 hours for buprenorphine.[33,36,37] The extended half-lives of these medications make them particularly effective at reducing cravings by staving off withdrawal symptoms between doses.

Both methadone and buprenorphine can be used in detoxification and maintenance treatment. Methadone maintenance, as compared with inpatient detoxification, has been shown to retain patients for longer durations and is associated with significantly less heroin use than individuals utilizing inpatient detoxification.[5] Additionally, methadone maintenance treatment has been associated with reductions in HIV incidence, mortality, injection drug use, syringe sharing, and slower progression of HIV disease, and is safe for treating opioid dependence in pregnant women.[38–46] Buprenorphine, while not as effective as methadone treatment overall, is more effective at retaining heroin users in substance use treatment than users receiving a placebo.[4,47,48]

MAT Provision and Utilization

In the United States, methadone is administered through opioid treatment programs (OTPs) that are certified and regulated by the Substance Abuse and Mental Health Services Administration (SAMHSA).[49] OTP regulations are strict, particularly regarding the frequency of methadone dosing, requiring most patients to report to the clinic for dosing five to six days per week.[50] This highly regulated environment is considered, by some, to be stigmatizing and a barrier to recovery.[51–53]

Given the restrictive nature of methadone provision in the United States, the approval of buprenorphine for the treatment of opioid dependence in office-based settings was ground-breaking. In 2000, President Bill Clinton signed the Drug Addiction Treatment Act of 2000 (DATA 2000), a bill that

allowed for the expansion of medication assisted treatments to outpatient settings beyond methadone maintenance treatment programs. Two years later, buprenorphine was approved by the Food and Drug Administration for the treatment of opioid dependence. In addition to office-based settings, buprenorphine can also be provided at methadone clinics and community based treatment programs by qualified physicians.[54] Evidence suggests that buprenorphine users are demographically different than methadone users, and include individuals residing in rural areas and users of prescription opioids, two factors which may help to expand the reach of MAT.[55]

Both the provision of MAT by substance use treatment programs and providers and the utilization of MAT by opioid dependent individuals is limited in the United States.[9,49,55–58] In 2010, 8% of all substance use treatment facilities in the United States provided MAT, and these programs served approximately one-quarter of all individuals attending substance use treatment.[59] Further, despite the increase in the use of substance use treatment among opioid dependent individuals over the last decade, MAT use decreased by 7%.[1]

Low MAT utilization is influenced by factors at several levels, including those related to individuals, organizations/providers as well as systems-level factors. At the individual-level, cocaine injecting or crack smoking[60,61], homelessness[62], recent or previous incarceration[61,62], injection drug use[60–62], previous negative experiences with MAT[63–65], stigma associated with MAT, particularly methadone[65–69] and the punitive treatment structure of methadone programs[70] have been negatively associated with MAT utilization. Individual-level factors found to be positively associated with MAT use include being female[61,62,71], married[71], having Medicaid coverage[62], heroin use[60,62,64], older age[61,62] and having previously been in substance use treatment[60,71].

The literature regarding the factors associated with the availability of MAT is largely focused on organizational-level factors of substance use treatment facilities. Factors positively associated with MAT

provision include large organizational size[54,72,73], receipt of public funding[54,58,72], awareness of Medicaid and/or state contract policies regarding coverage[74], having a physician on staff[58,72], public versus private ownership[54,72], and whether the program is located within a hospital setting[54,73,75]. In contrast, negative staff perceptions of methadone and/or buprenorphine and treatment ideology, particularly those that follow 12-step philosophy, have been negatively associated with MAT provision.[76–78]

Provider-level barriers regarding the dispensing of MAT in the United States are focused on buprenorphine given that methadone can only be dispensed in certified substance use treatment facilities. Barriers to providing buprenorphine, as cited by potential or actual buprenorphine providers, include: insurance coverage/reimbursement concerns[79–81], negative perceptions of substance users and/or buprenorphine[81–83], lack of expertise or necessary training[79–81,84–86], lack of time[79,81,83,85]and lack of support[79–81,84,85,87].

Finally, the perspective least explored is the role of systems or state-level factors in methadone or buprenorphine provision, which is part of the focus of this dissertation. Factors such as local zoning restrictions that prohibit mobile dispensing of methadone and/or buprenorphine[88], lack of support by state agencies for methadone and/or buprenorphine[74,88], lack of state Medicaid coverage of methadone and/or buprenorphine[54,89] and buprenorphine prescribing regulations that require pre-authorization by some insurance companies[88] have all been found to be negatively associated with MAT provision. Two important positive associations must be noted, both of which have been found in research investigating the adoption of naltrexone. Both higher state public assistance expenditures (per capita) and the prevalence of alcohol abuse or dependence were positively associated with naltrexone adoption.[89] These findings suggest that states with a greater need for substance use treatment and those that are more invested in safety net programs are more likely to adopt naltrexone. These findings are novel and have yet to be explored with respect to methadone and buprenorphine provision.

The findings regarding state-level barriers and facilitators of methadone and buprenorphine demonstrate the important role that states play in setting the tone for the way these treatments are perceived. States have the authority to direct public funds toward or away from treatment programs; therefore, a state's endorsement (or rejection) of a given treatment modality or approach can have significant impact on the extent to which substance use treatment programs adopt treatment options such as methadone and buprenorphine. To date, we are unaware of any research that has investigated the relationship between structural factors such as Medicaid coverage of MAT, and the use of MAT by opioid dependent individuals.

Treatment Wait Time

Chapter 6 describes the findings from an analysis of the factors associated with substance use treatment wait time entrance and Medicaid coverage of methadone and buprenorphine. This analysis was not limited to individuals receiving treatment in programs providing MAT; rather, this association was explored among individuals across all modalities of substance use treatment. Therefore, this section provides a review of the literature related to wait time across substance use treatment modalities. Treatment wait time is often reported as one of the most significant barriers to enrolling in substance use treatment.[90–94] The average time individuals wait to enter substance use treatment ranges from zero days, particularly in cities such as San Francisco and Baltimore that employ a treatment on demand model[95], to one week[96–99], 3 weeks[100,101] and over one month[91,96,102,103]. Delays in treatment entry have been associated with a lack of treatment enrollment[91,104,105], shorter periods of treatment engagement[98], an increased risk of mortality[106], arrest[107], untreated psychiatric problems[108], HIV[109], and a return to or initiation of injection drug use (IDU)[110]. Finally, an inverse relationship between wait time and treatment entry has been observed in several studies, such that the longer a person waits to enter treatment, the less likely they are to enroll in it.[92,95,111–113]

Methadone, in particular, has been associated with an increase in waiting time for treatment entry.[114–116] Andrews et al found that individuals initiating methadone treatment were three times more likely to wait one month or more to enter treatment as compared with individuals waiting to enter other outpatient programs.[116] Gryczynski et al also found significant delays for individuals seeking methadone treatment, as compared with other treatment modalities. In their study, less than one quarter of individuals enrolling in methadone treatment were able to begin treatment within four months of initiating contact with a program.[103]

The literature regarding substance use treatment wait time is largely focused on factors related to individuals and organizations. Individual-level factors such as unemployment[96], homelessness[96], being African American[103,116], cocaine use[103,106] and psychiatric problems[103] have all been associated with longer wait times for treatment entry. The associations between age[96,106,117] and gender [100,102,105] and treatment wait time have been inconsistent.

Organizational factors, particularly regarding program inefficiencies, are believed to contribute most significantly to wait times.[90,98,118–121] In fact, in the Treatment Episodes Data Set (TEDS), which was the main dataset utilized for the analysis of wait time, substance use treatment programs were directed to calculate treatment wait times as "the number of days the client must wait to begin treatment because of program capacity, treatment availability, admissions requirements, or other program requirements. It should not include time delays caused by client unavailability or client failure to meet any requirement or obligation".[122] Specific organizational factors associated with delays to treatment entry include larger client caseload[96,123], staff shortages,[92] provision of methadone[116], inefficient phone scheduling systems[99], central intake units[94] and increased proportion of clients receiving public assistance[123]; whereas forprofit programs[117], programs with an increased number of patients attending daily[96] and programs with performance contracting[101], or financial incentives for improvement in patient outcomes or organizational efficiencies, have been associated with reduced treatment wait times.

Structural level factors have been the least explored with regard to treatment wait times. Factors such as bureaucratic delays related to processing court-ordered treatments[94,96] and a lack of insurance[94] have been associated with increased wait times for treatment entry.

Medicaid Coverage of Methadone and Buprenorphine

Medicaid is a combined federal/state program that provides health insurance for low-income individuals and families. The federal government offers guidelines to states regarding the extent to which medical services and medications should be covered by Medicaid. Ultimately, however, each state creates their own eligibility requirements, as well as coverage parameters for medical care and medications.[124] Prior to 2014, substance use treatment was considered an optional benefit under federal Medicaid guidelines, meaning that states were not required to cover it beyond detoxification. As a result, there was significant state variability in the extent to which substance use treatment was covered, particularly regarding methadone and buprenorphine. In some states, for example, neither buprenorphine nor methadone was covered by Medicaid; however, in other states Medicaid covered one or both medications as long as they were provided in specific settings or after physicians obtain preapproval. As of 2008, the most recent year utilized in the analyses for this dissertation, 19 states had some form of restriction on the coverage of buprenorphine and/or methadone.[9]

Medicaid is the largest purchaser of both buprenorphine and methadone and Medicaid beneficiaries represent the largest group of opioid dependent individuals in the United States.[7,8] According to the National Survey on Drug Use and Health (NSDUH), approximately 14% of Medicaid beneficiaries have a substance use disorder, as compared with 10% of the general population.[125] Given this, Medicaid coverage of substance use treatment services has the potential to impact a significant number of individuals in the United States. In the remaining chapters of this dissertation, the results of three analyses will be presented related to Medicaid coverage of MAT, including (1) the factors correlated with

Medicaid coverage of MAT, (2) the association between Medicaid coverage of methadone and buprenorphine and treatment wait time, and (3) the association between Medicaid coverage of methadone and the utilization of MAT.

Chapter 3: Data and Methods

This dissertation includes both state-level (Aim 1) and individual-level (Aims 2 and 3) analyses of datasets that were compiled using multiple sources. In this chapter, I provide a description of each dataset, including a detailed explanation of each data source and the variables contained within, a description of how each analytical sample was created and the techniques used to handle missing data and the validation of study findings.

Data Sources and Variable Description

Individual-level Data

The primary data source for this dissertation was the Treatment Episodes Dataset-Admissions (TEDS-A). The TEDS-A is an administrative data set composed of annual admissions of individuals 12 years of age and older to substance use treatment programs in the United States that are licensed or certified by State agencies.[126] TEDS-A is primarily composed of admissions to substance use treatment programs that receive public funds; however, some states also require non-publicly-funded programs to report demographic and treatment-related data, and therefore may be included in TEDS-A. Substance use treatment programs that are not likely to be contained within TEDS-A include programs that are not licensed by the State, including some hospitals, private-for-profit programs and programs operated by the Bureau of Prisons, the Department of Defense and the Veterans Administration.[126]

TEDS-A data are publicly available for download through the Substance Abuse and Mental Health

Data Archive (SAMHDA), which is maintained by SAMHSA and available through the Institute for Social Research (ISR) website at the University of Michigan.[127] TEDS-A includes a mixture of self-reported and program-reported demographic characteristics such as gender, age group, race/ethnicity, among other variables, and treatment-related variables such as substances of abuse, substance use treatment history and treatment program type. While TEDS-A provides individual-level data for substance use treatment episodes, these data describe encounters with substance use treatment, rather than individual clients. For example, if the same individual has entered substance use treatment four times within a calendar year, there will be four separate treatment episodes counted in TEDS-A, not one.

TEDS-A Variables

All individual-level variables in Aims 2 and 3 came from the TEDS-A. Below is a description of each variable, as well as an explanation of any recodes that were made to them.

TEDS-A – Independent Variables

Age: When initially collected by programs, age was a continuous variable. However, when the TEDS-A is cleaned for public use, SAMHDA recodes age into a categorical variable in order to protect the ages of the youngest and oldest individuals in substance use treatment. The resulting age categories by years are: 12-14, 15-17, 18-20, 21-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55 and over.

In Aim 2, based on the age distribution of the sample, age was recoded and dummy coded in the following manner: Less than 18, 18-24, 25-34, 35-44 and 45 and over. In Aim 3, based on the distribution of the sample, which had fewer very young individuals, age was recoded and dummy coded as: Less than 25, 25-34, 35-44 and 45 and over.

Male: In the original dataset, sex was coded as 1 for males and 2 for females. Sex was recoded for all analyses in this dissertation to female=0 (referent group) and male=1.

Race: The original race variable included 9 categories: Alaska Native, American Indian, Asian or Pacific Islander, Black or African American, White, Asian, Other single race, Two or more races (only for 2006 and 2008 TEDS-A), Native Hawaiian or other Pacific Islander. Based on the distribution of the sample, race was dummy coded into three main categories: White (referent group), Black and Other Race(s).

Hispanic: TEDS-A provided 6 options for ethnicity: Puerto Rican, Mexican, Cuban, Other specific Hispanic, Not of Hispanic Origin and Hispanic, specific origin not specified. Ethnicity was dummy coded into a binary variable where Puerto Rican, Mexican, Cuban, Other specific Hispanic and Hispanic, specific origin not specified became Hispanic=1, and individuals not of Hispanic origin were coded as Hispanic=0 (referent group).

Married: Marital status contained 4 original categories: never married, now married, separated and divorced/widowed. Based on the distribution of these categories, marital status was recoded into a binary variable where never married and divorced/widowed became married=0 (referent group) and married and separated individuals became married=1.

Marital status was a supplemental variable in TEDS-A, and therefore was not reported by every program. In the final Aim 2 dataset, before any missing data techniques were used, the largest amount of missing data for marital status in any one year or combined year, for either methadone or buprenorphine, was 27%. In the final Aim 3 dataset, before any missing data techniques were employed, the largest amount of missing data for marital status in any of the methadone analyses was 23%. High School Ed: The original TEDS-A variable education contained 5 categories: 8 years or less, 9-11 years, 12 years, 13-15 years and 16 or more years. Education was recoded into a binary variable where 12 or more years of education became high school education=1 and less than 12 years became high school education=0 (referent group).

Employed: This variable reflects the employment status of individuals at the time of enrollment in a treatment program. The original employment categories were: full-time, part-time, unemployed and not

in labor force. This variable was recoded into a binary variable where individuals working full or parttime were recoded as 1 and those individuals that were unemployed or not in the labor force were recoded as 0 (referent group).

Unstable Housing: This variable describes the living arrangement of individuals at the time of treatment entry. The original variable contained 3 categories: homeless, dependent living (individuals living in a residential facility, halfway house, group home or children less than 18 years of age who are living with parents, relatives, guardians or in foster care), and independent living (individuals living alone or with others without any supervision, including individuals 18 and older who live with their parents). Living arrangement was recoded to reflect unstable housing, where homeless and dependent living individuals were coded as 1 for unstably housed and individuals who were living independently were coded as 0 for unstably housed (referent group).

Living arrangement was a supplemental variable, and therefore not reported by every program. In the Aim 2 analyses before any missing data techniques were used, the largest amount of missing data for this variable in any one year or combined year, for either methadone or buprenorphine, was 12%. In the Aim 3 analyses before any missing data techniques were employed, the largest amount of missing data for this variable in any of the methadone analyses was 32%.

Primary Source of Income/Support: This variable describes the primary source of income, and for individuals under 18 years of age, the parent's primary source of income at the time of treatment admission. This variable was dummy coded using the original categories: wages/salary (referent group), public assistance, retirement/pension, disability, other and none. The primary source of income/support variable was also a supplemental variable, and therefore not reported by every program. In the final Aim 2 dataset, before any missing data techniques were used, the largest amount of missing data for any category of primary source of income in any one year or combined year, for either methadone or buprenorphine, was 45%. In the final Aim 3 dataset, before any missing data techniques were employed,

the largest amount of missing data for any category of primary source of income in any of the methadone analyses was 60%.

Treatment Program Type: This variable describes 8 treatment types and/or settings in which treatment was provided. A description of each category follows, as well as an explanation of the recoded variable.

1. Detoxification/24 hour service/Hospital inpatient – Hospital settings in which acute care medical detoxification services were provided 24 hours per day for persons who might experience withdrawal complications.
2. Detoxification/24 hour service/Free-standing Residential – Non-hospital settings in which 24 hour per day care is provided for safe withdrawal and transition to ongoing treatment.
3. Rehabilitation/Residential-Hospital (Other than Detox) – Treatment services for alcohol or drugs that were provided within a hospital setting and included 24 hour per day medical care.
4. Rehabilitation/Residential-Short Term (30 days or fewer) – Non-acute care treatment services for alcohol or drugs for 30 days or less.
5. Rehabilitation/Residential-Long Term (More than 30 days) – Non-acute care treatment services for alcohol or drugs for longer than 30 days. This category includes programs such as halfway houses.
6. Ambulatory-Intensive Outpatient – Outpatient programs in which clients received at least two hours of treatment per day, for at least three days per week.
7. Ambulatory-Non-Intensive Outpatient – Outpatient programs in which clients received individual, family or group services. This category includes programs that provided MAT.
8. Ambulatory-Detoxification – Outpatient treatment programs in which clients received services and/or MAT to withdraw from alcohol or drugs.

In the Aim 2 dataset, treatment program type was recoded into three main categories of programs: detoxification, outpatient and rehab (referent). Detoxification/24 hour service/Hospital inpatient, Detoxification/24 hour service/Free-standing Residential and Ambulatory-Detoxification were recoded to detox=1 (all others=0). Rehabilitation/Residential-Hospital (Other than Detox), Rehabilitation/Residential-Short Term (30 days or fewer) and Rehabilitation/Residential-Long Term

(more than 30 days) were recoded to rehab=1 (all others=0). Ambulatory-Intensive Outpatient and Ambulatory-Non-Intensive Outpatient were recoded to outpatient=1 (all others=0).

In the Aim 3 dataset, because of the distribution of programs, treatment program type was recoded so that Rehabilitation/Residential-Short Term (30 days or fewer) and Rehabilitation/Residential-Long Term (More than 30 days) became rehab=1 and all other programs were rehab=0.

Number of Substances Using: This variable indicates the number of substances that a person reported using at the time of treatment admission. The original variable had 4 categories, ranging from 0-3, to reflect the primary, secondary and tertiary substances used. This variable was dummy coded with 3 substances as the referent category. In the Aim 2 buprenorphine analysis and the Aim 3 analysis, there were no individuals reporting 0 substances of abuse during each of the study years so only one, two and three substances of abuse were used in these analyses.

IDU: This binary variable reflects whether a person reported injecting either their primary, secondary or tertiary substance of abuse at the time of admission.

Cocaine: This binary variable reflects whether cocaine was reported as the primary, secondary or tertiary substance of abuse at admission.

Heroin: This binary variable reflects whether heroin was reported as the primary, secondary or tertiary substance of abuse at admission.

Non-prescription Methadone: This binary variable reflects whether non-prescription methadone was reported as the primary, secondary or tertiary substance of abuse at admission.

Synthetic Opioids: This binary variable reflects whether synthetic opioids were reported as the primary, secondary or tertiary substance of abuse at admission.

Benzodiazepines: This binary variable reflects whether benzodiazepines were reported as the primary, secondary or tertiary substance of abuse at admission.

Any opioid use: This binary variable was created by combining the heroin, synthetic opioid and nonprescription methadone use variables, so that if a person reported using any of these drugs, opioids was coded as 1, and if they did not report using any one of them, opioids was coded as 0.

Psychiatric Problem: This binary variable indicates whether an individual has a psychiatric problem, as identified through self-report and/or program report. The psychiatric problem variable was a supplemental variable, and therefore was not reported by every program. In the final Aim 2 dataset, before any missing data techniques were used, the largest amount of missing data for psychiatric problem in any one year or combined year, for either methadone or buprenorphine, was 26%. In the final Aim 3 dataset, before any missing data techniques were employed, the largest amount of missing data for any category of primary source of income in any of the methadone analyses was 29%. Primary Health Insurance Type: This variable indicates the primary type of health insurance coverage a person had at the time of treatment admission. The original variable was categorical but was dummy coded for these analyses using the original categories: private insurance (referent group), Medicaid, Medicare and none. Health insurance was a supplemental variable, and therefore was not reported by every program. In the final Aim 2 dataset, before any missing data techniques were used, the largest amount of missing data for any category of client insurance coverage in any one year or combined year, for either methadone or buprenorphine, was 50%. In the final Aim 3 dataset, before any missing data techniques were employed, the largest amount of missing data for any category of client insurance coverage in any of the methadone analyses was 54%.

TEDS-A – Dependent Variables

Days Waiting to Enter Treatment: This continuous variable was the outcome variable used in Aim 2. Treatment wait time reflects the number of days between a person's first contact with a program and their date of admission or receipt of their first clinical service. Treatment wait time reflects delays in

treatment entry due to program capacity, treatment availability, admission requirements or other requirements related to the program. Programs are directed to not report any delays in treatment entry that are caused by the unavailability of the client. The range of possible values for treatment wait time was 0 to 996 days.

Days waiting to enter treatment was a supplemental variable, and therefore was not reported by every program. In the final Aim 2 dataset, before any missing data techniques were used, the largest amount of missing data for treatment wait time in any one year or combined year, for either methadone or buprenorphine, was 24%.

Enrolled in MAT: For the Aim 3 analyses, the TEDS-A Medication Assisted Treatment variable was the outcome variable of interest. This binary variable indicated whether methadone or buprenorphine were part of an individual's treatment plan. This variable does not, however, specify which of the two MATs, methadone or buprenorphine, was used. The variable was coded as yes=1 and no=2 and was recoded to enrolled in MAT=1 and not enrolled in MAT=0.

Structural Variables

Variables representing the state economic environment and need for substance use treatment within a state were utilized in Aim 1 of this study to investigate the correlation between two sets of factors, economic and need, and Medicaid coverage of methadone and buprenorphine. Some of the state-level factors from the Aim 1 analyses were included in the analyses for Aims 2 and 3 as fixed effects estimators to help account for the unobserved heterogeneity of the state environment. A description of each structural variable follows.

Federal Medical Assistance Percentages (FMAP): The Federal Medical Assistance Percentage is the proportion of funds that the federal government contributes to each state's Medicaid program. The

FMAP varies by state and is largely based on the per capita income of the state.[128] On average, the FMAP rate is 57%, meaning that the federal government pays 57% of Medicaid costs. While the FMAP rate is never lower than 50%, in 2013 it was over 70% for Arkansas, the District of Columbia, Idaho, Kentucky, Mississippi, South Carolina and West Virginia.[129] The FMAP rate is reassessed every three years in order to account for changes in a state's overall wealth. FMAP rates for this study were obtained for fiscal years 1998, 2006 and 2008 from the Department of Health and Human Services.[130] The fiscal year covers the period of October 1, 1997 – September 30, 1998, October 1, 2005 – September 30, 2006 and October 1, 2007 – September 30, 2008.

State Expenditures: State expenditure data were obtained from the National Association of State Budget Officers.[131–133] Some of the broad expense categories that are included in the annual state expenditure total are: education, public assistance, Medicaid, corrections, transportation and capital expenses. State expenditure totals were obtained for fiscal years (July 1-June 30) 1998, 2006 and 2008.

Percent of Residents Receiving Medicaid: Data regarding Medicaid beneficiaries were obtained from the Centers for Medicaid and Medicare (CMS), Medicaid Statistical Information System.[134–136] The total number of beneficiaries was obtained for each state and was then divided by each state's estimated population total (data obtained from the United States Census Bureau[137]), and then multiplied by 100. Medicaid beneficiary data were obtained for 1999 (1998 Medicaid beneficiary data were not available), 2006 and 2008.

Per Capita Income: Per capita income data were obtained from the United States Department of Commerce, Bureau of Economic Analysis for 1998, 2006 and 2008.[138] The per capita income in each state is calculated by summing the total personal income for all state residents, divided by the total midyear population, as estimated by the United States Census Bureau.

Substance Abuse Prevention and Treatment Block Grant (SABG) funding: SABG funds provide states with the opportunity to address their substance use prevention and treatment needs in ways that are unique

to their individual communities. The amount each state receives is dependent upon population size, the total personal income for state residents and the amount of taxable resources in a state.[139] SABG data were obtained from the Substance Abuse and Mental Health Services Administration for fiscal years 2006 and 2008 (1998 data were not available).[140] Data used for this study were limited to substance use treatment block grant funds, excluding state funding that was obtained for substance use prevention.

Rate of Individuals in Opioid Treatment: To calculate the opioid treatment rate, the number of opioid dependent individuals in 1998, 2006 and 2008 were obtained from the TEDS-A. TEDS-A data were limited to individuals reporting opioids as their primary, secondary or tertiary substance of abuse. To standardize the number of opioid dependent individuals seeking treatment across states, an opioid treatment rate of opioid dependent individuals per 10,000 population was calculated based on the number of opioid dependent individuals and the population of each state.

Methadone and Buprenorphine Program Rate: The number of opioid treatment programs were obtained from the Uniform Facility Data Set (UFDS) for 1998, and the National Survey of Substance Abuse Treatment Services (N-SSATS), formerly known as the UFDS, for 2006 and 2008.[141] The UFDS and N-SSATS include all private and publicly funded substance use treatment programs in the United States. The UFDS and N-SSATS data used for this study were limited to the total number of programs providing methadone in 1998 or 2008 and buprenorphine in 2006 and 2008. In order to standardize the number of programs per state, a program rate of programs per one million population was calculated based on the number of methadone and buprenorphine programs (calculated separately) and population of each state.

Medicaid Coverage of Methadone: State Medicaid coverage of methadone for 1998 and 2008 was obtained from two sources. For 1998, data were obtained from McCarty et al's article, "Methadone Maintenance and State Medicaid Managed Care Programs".[142] This article describes the results of a cross-sectional study of Medicaid coverage restrictions for methadone in each state in the U.S. in 1998.

For 2008, state Medicaid coverage of methadone was obtained from the State Financing for Medication Assisted Treatment study, which includes cross-sectional data on Medicaid coverage of both methadone and buprenorphine.[9] For both study years, Medicaid coverage of methadone was dichotomized as yes/no.

Medicaid Coverage of Buprenorphine: State Medicaid coverage of buprenorphine in 2006 was gathered from Ducharme at al's article, "State Policy Influence on the Early Diffusion of Buprenorphine in Community Treatment Programs", which describes the results of a cross-sectional investigation of the organizational factors associated with state policy restrictions of Medicaid coverage of buprenorphine.[54] Similar to the 2008 data used for methadone, data for Medicaid coverage of buprenorphine in 2008 were obtained from the State Financing for Medication Assisted Treatment study. Similar to methadone, Medicaid coverage of buprenorphine was dichotomized as yes/no for both 2006 and 2008.

Construction of Analytic Samples

Each study aim utilized a different sample based on available data for the predictors and outcome of interest in the study analyses. This section describes how each analytic sample was derived.

Aim 1

The Aim 1 dataset was developed by gathering state-level data for Medicaid coverage of methadone and buprenorphine, FMAP rates, percent of residents receiving Medicaid, per capita income, total state expenditures, SABG, rate of opioid dependent individuals in treatment and rate of methadone and buprenorphine programs. These data were entered into Microsoft Excel and were matched based on the state indicator variable. Matching was done for each state per study year. The final dataset was then exported to SAS 9.3 for analyses.

As a state-level exploration, the potential analytic sample for each analysis in Aim 1 began with N=50. Due to missing data on the outcome and/or main predictors of interest, the sample was then reduced in each study year and in the combined year analyses for both treatment types. As displayed in Figure 1.3, the 1998 methadone analysis was reduced to N=48, excluding Nevada and West Virginia due to missing data. In 2008, the methadone sample was reduced to N=44 due to missing data, excluding the District of Columbia, Mississippi, North Carolina, North Dakota, Rhode Island and Texas. Finally, in the combined year analysis for methadone, the final sample was N=92 after excluding the District of Columbia, Mississippi, North Carolina, North Dakota, Nevada, Rhode Island, Texas and West Virginia due to missing data in one or both study years. The unit of analysis for the combined year sample was stateyear.

Due to missing data on either the outcome variable or one of the predictor variables of interest, the 2006 buprenorphine sample was reduced to N=48, with Alaska and Georgia excluded from the analyses. The 2008 buprenorphine sample was limited to N=45 due to missing data from the District of Columbia, Mississippi, North Carolina, Rhode Island and South Carolina. Finally, the combined 2006-2008 buprenorphine sample, after excluding Alaska, the District of Columbia, Georgia, Mississippi, North Carolina, Rhode Island and South Carolina due to missing data, was limited to N=93. The unit of analysis for the combined year sample was state-year.

Aim 2

Two datasets were constructed for the Aim 2 analyses, one dataset for the 1998, 2008 and combined 1998-2008 methadone analyses, and one dataset for the 2006, 2008 and combined 20062008 buprenorphine analyses. Each dataset was primarily composed of individual-level data from the TEDS-A, as well as state-level predictors utilized in the Aim 1 analyses. Both datasets included the following individual-level variables: sex, race, ethnicity, education, marital status, employment status, living

arrangement, age, treatment program type, MAT use, psychiatric problems, reported drug use, including: heroin, cocaine, methamphetamines, non-prescription methadone, synthetic opioids, benzodiazepines, any opioids, the total number of substances reported at treatment admission, IDU, health insurance type and primary source of income. In addition to the aforementioned individual-level data from TEDS-A, the methadone dataset included the following structural factors: Medicaid coverage of methadone, state per capita income, state methadone program treatment rate, percent of individuals receiving Medicaid and rate of opioid dependent individuals engaged in substance use treatment. The buprenorphine dataset included the following structural predictors: Medicaid coverage of buprenorphine, per capita income, SABG, percent of individuals receiving Medicaid, buprenorphine program treatment rate, and rate of opioid dependent individuals engaged in substance use treatment. TEDS-A data were matched with these structural variables based on the state indicator variable. For instance, if the methadone treatment rate for NJ was 40.5, every individual receiving treatment in NJ would have 40.5 for the methadone treatment rate variable in the final dataset. This matching was done for each study year and the data were then merged into a final dataset that contained both study years. In the final combined dataset, the unit of analysis was person-year.

Methadone dataset

Figure 2A.1 describes the analytic sample sizes for the methadone analyses performed for Aim 2, as well as the steps in which the sample was restricted. The initial methadone dataset contained a total of 3,721,278 individuals for the combined 1998-2008 period, with 1,704,606 individuals for 1998 and 2,016,672 for 2008. Each sample year was restricted to fourteen states in which there were sufficient data available for the outcome of interest, main predictor variables and the combined year analyses. These fourteen states included: Arizona, Colorado, Florida, Hawaii, Idaho, Iowa, Kansas, Louisiana, Montana, New Hampshire, New Mexico, Ohio, South Carolina and Wyoming. The largest

amount of missing data for any one variable retained in the methadone dataset was 54%. Once the methadone sample was restricted to these fourteen states, there were 357,031 individuals in the 1998 dataset and

432,993 in the 2008 dataset.

Two different approaches, multiple imputation (MI) and listwise deletion (LD), were utilized to handle missing data in Aims 2 and 3 of this study [a more in-depth explanation of MI and LD is included later in this chapter]. MI was performed for each single study year (the combined study year sample size was too large). The MI sample, which was drawn from the fourteen state sample, was N= 1,364,735 for 1998 and N= 2,034,778 for 2008. For the LD analyses, each year and the combined year sample was restricted to only those individuals in which there were complete case data. The final LD sample was N=98,183 for 1998, N=162,242 for 2008 and a combined 1998-2008 sample of N=260,425.

Bootstrap Analysis (BA) was also conducted for each year and combined year dataset because it is known to produce stable, unbiased estimates that demonstrate good internal validity, which is crucial in large sample sizes[143] [a more in-depth explanation of MI and LD is included later in this chapter]. The BA models are presented as the final models for Aims 2 and 3.

Each BA consisted of an unrestricted random sample of individuals selected from each LD dataset. The initial BA samples were N=290 for 1998, N=243 for 2008 and N=259 for the 1998-2008 dataset. As part of the BA procedure, each sample was replicated in 100 separate datasets which were then combined to form a final sample. The final BA samples for the methadone analyses were N=29,500 for 1998, N=24,400 for 2008 and N=26,100 for the combined 1998-2008 dataset.

Buprenorphine Dataset

Figure 2B.1 depicts the various sample sizes for the buprenorphine analyses. The main, 2006-2008 combined year dataset contained 3,721,278 individuals, 1,914,338 from 2006 and 2,016,672. A similar process was used to subset the buprenorphine data as was used for the methadone dataset. For

the buprenorphine analyses, there were 24 states with sufficient data available for the outcome of interest, main predictor variables and the combined year analyses. These states included: Arizona, Arkansas, California, Colorado, Florida, Hawaii, Idaho, Illinois, Iowa, Kansas, Louisiana, Maryland, Michigan, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Ohio, South Dakota, Utah and Wyoming. The largest amount of missing data for any one variable retained in the buprenorphine dataset was 50%. The sample size, after restricting the analyses to these twenty four states, was N=883,207 for 2006 and N=968,237 for 2008. This sample, based on individuals representing 24 states, was then utilized as the basis for MI. The MI sample was N= 4,258,996 for 2006 and N= 4,698,055 for 2008 (the combined study year sample size was too large to perform MI). The next step was to restrict the sample for the LD analyses, or to only those individuals with complete case data. The LD sample was N=240,757 for 2006, N=320,656 for 2008 and N=561,413 for the combined 2006-2008. Similar to the methadone analyses, BA was performed on the LD sample. The buprenorphine BA analyses consisted of three initial unrestricted random samples for each study year, N=241 for 2006, N=257 for 2008 and N=253 for the combined 2006-2008 dataset. Each of these samples was replicated in 100 separate datasets which were then combined to form a final sample. The final BA samples for the buprenorphine analyses were N=24,100 for 2006, N=25,700 for 2008 and N=25,300 for the combined 2006-2008 dataset.

Aim 3

The Aim 3 analyses utilized the primary methadone dataset described in Aim 2; however, the Aim 3 sample was restricted differently. Figure 3.1 provides an overview of the various analytic samples utilized in Aim 3, including the steps that were taken to restrict the sample for each analysis. As shown in Figure 3.1, similar to Aim 2, the initial 1998-2008 combined methadone sample contained 3,721,278 individuals, 1,704,606 from 1998 and 2,016,672 from 2008. The main outcome for Aim 3 was

use of medication assisted treatment, a treatment that is only appropriate for opioid users; therefore, the next step restricted the sample to only those individuals that reported opioids (including heroin, synthetic opioid or non-prescription methadone) as their primary, secondary or tertiary drug of abuse at admission. Once the sample was restricted to opioid users, the 1998 sample was N=327,647 and N=511,448 for 2008.

Thirty-eight states had sufficient data available in both 1998 and 2008 for the outcome of interest and main predictor variables. The 38 states were: Alaska, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Wisconsin and Wyoming. The largest amount of missing data for any one variable included in the sample was 60%. Once the remaining twelve states were excluded from the dataset, the 1998 sample was N=299,452 and the 2008 sample was N=461,004.

The 1998 and 2008 samples of opioid users from 38 states were then used as the basis for MI. The MI sample for 1998 was N=1,497,260 and the 2008 MI sample was N= 2,305,020. The next step was to restrict the 38 state sample for the LD analyses. The LD samples, once all cases with any missing data were removed, were N=8,311 for 1998, N=81,584 for 2008 and N=89,895 for the combined 1998-2008 sample.

Similar to Aim 2, bootstrapping was performed on each year's LD sample. The Aim 3 BA consisted of three unrestricted random samples for each of the study years, N=250 from the 1998 LD dataset, N=246 from the 2008 LD dataset and N=253 from the combined 1998-2008 dataset. Each of these samples was replicated in 100 separate datasets which were then combined to form final BA samples. The final BA samples were N=25,000 for 1998, N=24,600 for 2008 and N=25,300 for the combined 1998-2008 dataset.

Missing Data

As an administrative dataset, the TEDS contains several variables that substance use treatment programs are required to report, as per state law. However, the TEDS also includes supplemental variables that are not mandatory for programs to report, such as treatment wait time, psychiatric problems, health insurance type, veteran status, source of income, marital status, criminal justice referral and payment source. Several of these variables were included in the analyses for Aims 2 and 3, and treatment waiting time was the outcome of interest in Aim 2. Because these variables were optional for programs to report, there was a significant amount of missing data to contend with. This section provides an overview the types of missing data and describes the techniques used to handle missing data in this dissertation.

Types of Missing Data

Several methods have been developed to address missing data. Choosing the most appropriate method requires an understanding of the types of and/or reasons for missing data in order to minimize bias.[144,145] The three main types of missing data are: *missing completely at random* (MCAR), *missing at random* (MAR) and *missing not at random* (MNAR). When data are *MCAR,* there are no distinguishable patterns of variables leading the data to be missing.[146–148] For example, in a randomized controlled trial, data would be MCAR if participants in *both* the treatment and control arms drop out of the study because they had relocated. These data are MCAR because study arm assignment is unrelated to study participation and an individual's relocation. Data that are MCAR are considered "harmless" because they will not bias the mean or standard deviation estimated from the dataset, and will not impact the

estimated relationships among other variables in the dataset given the fact that missingness occurs because of random events.[144,149]

While the extent of missing data and the way in which missing data are handled are not often explained in publications, when missing data are reported, they are most frequently described as *missing at random* (MAR).[150] When data are MAR, the probability that the data are missing is based on observable characteristics within a study population but are not related to the outcome of interest.[147,148] For example, if a larger proportion of Hispanics, as compared with other racial/ethnic groups, are less likely to report their income on a survey, their data are considered MAR as long as the Hispanics in the sample include sufficient representation of Hispanics in all income strata. In other words, the missing data are conditional on being Hispanic but not on the dependent variable of income. Therefore, when data that are MAR take into account the variable on which they are conditional (such as including the conditional variable in a regression equation), bias can be minimized.[151]

Despite the fact that researchers usually report missing data as MAR, some researchers argue that missing data are usually *missing not at random (MNAR).*[150] Data that are MNAR occur when the probability that an item is missing is dependent upon unobserved information among a subset of participants.[147,148] Utilizing the previous income example, data would be considered MNAR if low income Hispanics were less likely to report their income on a questionnaire. In this case, the reason for missingness is a characteristic of the outcome of interest and is therefore not a random event. This is particularly problematic because any estimates produced from such a sample will be biased, in this case producing an inflated overall income for the sample due to fewer responses among lower income Hispanics.[144] Data that are MNAR weaken the generalizability of the findings because the pattern of the missing data is systematic and therefore the associations are not likely to represent the general population.

Missing Data Methods

This dissertation employed two techniques to address missing data: Listwise Deletion and Multiple Imputation. The following section provides an overview of each technique, as well as a discussion of other methods used to handle missing data.

Listwise Deletion (LD)

The most common method for analyzing missing data is listwise deletion, or excluding cases from analysis if any item within that case is missing. The underlying assumption of listwise deletion is that the data are MCAR; therefore, utilizing listwise deletion with data that are MCAR would not introduce bias because the data that are deleted do not have a systematic pattern of missingness.[152] However, when listwise deletion is applied to data that are MAR or MNAR, bias is likely to be introduced due to a potential overestimation of the certainty of the results. [153] For instance, if a sample of Americans were asked about their annual household income, and low income participants were less likely to report their income, the resulting mean income would be larger than the true mean income had the lower income individuals responded to that question. The standard error would be smaller than is accurate because the assumption is that the sample was randomly selected. However, when data are MAR or MNAR, and are excluded via listwise deletion, the retained sample no longer reflects a random sample of the population and therefore selection bias may be introduced. Some researchers, however, argue that utilizing listwise deletion with data that are MAR, particularly when the missing data for predictor variables are independent of the dependent variable, will yield unbiased results because it is similar to stratified sampling.[154]

A general drawback of listwise deletion, regardless of the type of missing data, is the impact that listwise deletion can have on statistical power. Because listwise deletion removes all cases from the dataset that have any missing data, this method poses a threat to external validity, particularly in studies

with small sample sizes. However, in large sample surveys, such as the TEDS-A, particularly when data are MCAR, listwise deletion is not likely to impact results due to the large sample size.[144] *Pairwise Deletion*

Pairwise deletion is similar to listwise deletion, in that missing data are excluded from analysis; however, with pairwise deletion, only the missing item is excluded while the rest of the case is retained.[152] The ability to preserve a majority of the items for each case is advantageous because it results in a larger sample size (as compared with listwise deletion), thereby increasing statistical power.

Similar to listwise deletion, utilizing pairwise deletion for data that are MCAR will likely produce unbiased results because of the ability to retain the entire sample minus the missing items. However, when using pairwise deletion for data that are MAR or MNAR, it is difficult to produce accurate estimates of the standard error due to fluctuations in the sample size.[155,156]

For example, when assessing the relationship between several independent variables via a correlation matrix, utilizing a dataset in which pairwise deletion has been performed can be problematic because each correlation may include a different set of cases, making comparisons difficult and potentially prohibiting the use of these correlations in multivariate analyses.[157]

Imputation

As a general category, imputation refers to the act of replacing missing values from a dataset with estimated values. Because imputation allows for the analysis of a complete dataset, threats to external validity may be minimized. There are several imputation methods, but the most widely utilized methods include: mean substitution, hot deck imputation, regression imputation, and multiple imputation. This section reviews each method, with a more in-depth description of MI, the imputation method used to handle missing data in this dissertation.

Mean Substitution

Mean substitution is the process of substituting a missing value with the mean of non-missing values.[158] Similar to both listwise and pairwise deletion methods, the main assumption underlying mean substitution is that the data are MCAR and normally distributed. When this is the case, substituting the mean for this missing data will likely lead to unbiased results. However, when mean substitution is used with data that are not MAR, it can lead to an under- or over-estimation of the true value of the item because the reason the item is missing may be associated with the outcome. For example, individuals with higher incomes may be less willing to report their income than individuals with lower incomes; therefore, by replacing missing income with the mean income, the result will be an underestimate of the true value of income. Similarly, mean substitution may also weaken variance estimates because by substituting the mean, the true variability of the data are compromised.

Hot Deck Imputation

Hot deck imputation is a useful tool for imputing missing data because this approach uses nonmissing values from characteristically similar respondents, called donors, to impute missing values.[159] This imputation process is carried out through the creation of a matrix of variables that a researcher deems are related to the missing item to be imputed.[160] For example, if occupational status (unemployed, employed, etc.) is missing from a survey, a researcher with in-depth knowledge of the study can identify a set of variables that may be associated with occupational status, such as occupation and annual income. The data then form a *deck* where respondents with complete data on each of these variables are sorted.[161] Then, respondents who match the donee, or the respondent with missing data, then form a donor pool of potential imputes.[152] The donor may be randomly selected from the pool, called random hot deck methods, or the donor may be the "nearest neighbor" meaning that it most closely resembles the missing data characteristics (called deterministic hot deck methods).[162]

Hot deck imputation is widely utilized in the analysis of large surveys conducted by organizations such as the United States Census Bureau and the Substance Abuse and Mental Health Services Administration. National surveys with large sample sizes are most appropriate for hot deck procedures because of the increased likelihood of finding a similar donor due to the large sample size. Hot deck imputation is not as useful when it is applied to data sets with large amounts of missing data, or when used in the analysis of data sets with a small sample size. In these cases, the validity of hot deck imputation is threatened due to the need to identify matching donors for several respondents (in datasets with large amounts of missing data), or the need to find matching donors with a limited number of respondents (in small datasets that may yield few donors).[158,163–165] Finally, in order to accurately identify similar donors in the hot deck procedure, researchers must be able to determine a set of variables that are predictive of the missing data. The hot deck procedure hinges on this identification, yet it is subjective, and as such introduces the potential for bias.

Regression Based Single Imputation

Similar to hot deck imputation, single regression imputation draws on what is known about cases with missing data, as well as cases with non-missing data, and uses this information to predict a missing value via a regression equation.[166] Using the same example as above, if we wanted to impute missing values for occupational status, we would first calculate the correlation between variables that we think might be associated with occupational status, such as annual income, occupation and several others, and those variables with the highest correlations would then be used as predictors in a regression equation in which employment status was the outcome variable. Then, all of the variables (with complete data) that were associated with the outcome are used to predict the missing values for employment status.[150]

Single regression imputation affords researchers the ability to "recover" missing data through estimates, a benefit that can increase statistical power and generalizability of the findings. Additionally, the ability to include random error in the regression equation helps to account for the uncertainty of the imputation procedure. Despite these advantages, there are also some noted drawbacks. In particular, similar to hot deck imputation, special attention must be paid to the variables chosen as predictors for the imputation. If there is multicollinearity among these variables, the variance of the missing data variable may be artificially high.[146] Finally, single regression imputation assumes a linear relationship between variables; however, when this is not the case, the model may produce artificially low significance values, leading to a falsely conclusion of statistical significance.

Multiple Imputation (MI)

Multiple imputation (MI) is similar to hot deck and single regression imputation, in that this procedure also utilizes existing data to help inform imputed values. However, with MI, the process of creating imputed values for missing data is carried out several times.[167] More specifically, similar to single regression imputation, a predictive statistical model is developed based on a set of independent variables that are correlated with the missing variable, an error term is added and then an imputed value is computed.[168] This process is then repeated, usually between five and ten times, resulting in the creation of five to ten complete data sets. Once these data sets are created, analyses can then be performed (analyses are run separately on each dataset), and the results are then pooled in order to create a single set of statistics, including parameter estimates and standard errors.

The main advantage of MI is that through these multiple steps in the procedure, and the inclusion of an error term at each step, the uncertainty inherent in imputation is accounted for because the variability of the data is considered. The ability to account for the fluctuations in standard error across

each imputed data set can help reduce type I error, or the wrongful conclusion that there is an effect when none is present.[152]

The creation of several distinct data sets in the MI procedure is a critical strength to this technique. Because each data set is generated randomly, the potentially imputed values may vary slightly from one another. The randomness and repeated process of MI help to increase the likelihood of making valid inferences based on these imputed data by increasing the random variability that is inherent in nonimputed data.[168]

MI has been used to impute missing data in research on sensitive topics, such as substance use and sexually transmitted infection status. For example, MI was used in a study investigating the factors associated with severe liver disease among HCV-infected PWIDs.[169] The predictive model contained 8 variables, 6 of which had varying amounts of missing data. Researchers used both listwise deletion and MI to determine which of the eight factors were associated with severe liver disease. When comparing the two methods, listwise deletion found that male sex, age over 40, HCV infection of 18 years or more, excessive alcohol consumption and HCV genotype 3 were all associated with severe liver disease. The MI-enhanced model found the same five variables to be associated with severe liver disease, as well as the addition of HIV infection. Though the findings from the listwise deletion model are similar to the MIenhanced model, the increase in power provided by MI allowed for additional associations, affirming the current evidence base regarding the role of HIV co-infection in advancing liver disease, [170–173]

MI and listwise deletion methods were also utilized in a study predicting factors associated with Chlamydia infection among teenage and young adult men.[174] Laboratory data confirming Chlamydia status were missing for 28% of the young adult sample and 18% of the teenage sample. Researchers first assessed whether missing data were due to a nonresponse bias and determined that males in both samples with missing Chlamydia status were not significantly different than males with complete data. Researchers then imputed missing Chlamydia status for both samples utilizing MI and compared the

results to those achieved through listwise deletion. There was little difference in the findings between the missing data methods so the researchers chose to report the listwise deletion model results in their paper. This study demonstrates that in certain circumstances, such as datasets with large sample sizes and when there is a lack of association between the missing data and the outcome of interest, listwise deletion can be as effective as multiple imputation.[144]

A main drawback of MI is the accurate specification of predictor variables.[168,175] Researchers using MI must have a distinct sense of the variables that predict missingness because these variables must be included in the imputation model in order to reduce bias and potentially invalid conclusions. For example, Hippisley-Cox developed an algorithm to predict cardiovascular risk among UK residents and, after using MI to account for missing data, found that cholesterol was not associated with cardiovascular risk.[176] This finding drew a fair amount of criticism given that it defied conventional wisdom about cardiovascular risk.[177–179] Due to these criticisms, the authors re-ran their analyses using listwise deletion, and found a strong association between cholesterol and cardiovascular risk.[180] The authors then developed new MI models that included additional predictor variables that might help to inform the missing values. When the revised MI-enhanced dataset was used to run the cardiovascular risk model, the researchers found an association between cholesterol and cardiovascular risk. Given this, the authors concluded that they had not used a sufficient number of independent variables in the initial MI model to accurately predict the imputed values, which then led to an underestimation of the association between cholesterol and cardiovascular risk.[180]

To explore missingness in this dissertation, cases that contained missing data were compared to those without missing data on all variables of interest in this study. The results of these comparisons indicate that for both Aims 2 and 3, the two samples were significantly different on nearly every study variable, indicating that the data are not likely MCAR.

Because this dissertation utilized very large datasets, concerns regarding a reduction in sample size when considering missing data methods were minimized. For this reason, and the fact that retaining the same sample size across analyses was preferable, LD was chosen as one method for handling missing data in this dissertation. However, given the large amount of missing data in both of the Aim 2 and 3 datasets, MI was also chosen so that complete case analyses could be performed, and any bias associated with excluding cases with missing data would be reduced. Both methods were performed for each Aim and study year and the findings across these methods were compared for the main outcomes in Aims 2 and 3. Due to the very large dataset for the combined year analyses, only LD was carried out.

Listwise Deletion was carried out by eliminating all cases from each dataset that contained at least one missing value. A dummy variable indicating missing data in any one of the variables of interest was created and the sample was then restricted based on those cases in which there were no missing data. Multiple imputation was performed using the ProcMI function and Markov Chain Monte Carlo method in SAS 9.3 (SAS Institute, Cary, NC). While there is some disagreement in the literature regarding the inclusion of outcome variables in MI procedures[181–183], the dependent variable was included in all MI procedures. All study variables, including the dependent variables, were included in the imputation models. Each single year dataset in Aims 2 and 3 were imputed five times. Regression analyses were then performed on each dataset and the results were pooled using the ProcMIAnalyze function.

Validating Findings Derived from Large Samples

The final samples used in the analyses for Aims 2 and 3 were very large, even after restricting them by study criteria and to those individuals with complete data. An important issue to consider when analyzing large datasets such as these is that the increased power due to the large size of the sample can result in an increase in the amount of significant associations.[184] These associations, while statistically significant, may have very small effect sizes, reducing the utility of the p-value as the sole basis for

interpreting study findings.[185] One way to address this limitation is to present the effect sizes and confidence intervals along with the p-value so that readers have a better understanding of the extent of the relationship between variables.[184] Another way to address this concern is to utilize a validation procedure to augment significance testing.[143] The most commonly used validation procedures are bootstrapping and jackknifing. The bootstrap and jackknife procedures are resampling techniques that can be used with non-normally distributed data to estimate parameters, standard errors and confidence intervals. These techniques are particularly useful when there is uncertainty regarding the generalizability of study findings. The following section provides a brief overview of each method.

Jackknife

As a resampling procedure, the jackknife technique, also known as the "leave one out" procedure, utilizes an entire sample, without replacement, to estimate a given parameter.[186] To do this, a single case is eliminated from the original sample one step at a time, and a "pseudo-value" is computed to estimate the parameter of interest at each step.[185] This procedure is repeated over a specified number of times as each observation is dropped from the sample. Once the iterative estimate process is complete, the "pseudo-values" are averaged to create an overall estimate of the parameter of interest.[187]

In addition to parameter estimates, the jackknife procedure can be used to create confidence intervals and estimate standard errors. Because observations or cases are removed from the original dataset one at a time, the jackknife procedure is particular sensitive to outliers and can reduce bias given the ability to detect these observations.[185]

Bootstrap

Similar to the jackknife procedure, bootstrapping involves the creation of a new set of samples via repeated resampling from an original, representative sample. Unlike the jackknife procedure, bootstrapping allows for random sampling with replacement, meaning that each time an observation is selected for bootstrapping, it is returned to the original dataset, allowing for it and all other observations to have an equal chance of being drawn at each selection step.[188] This procedure is repeated until a set number of cases is achieved for a set number of samples. The target sample size is determined prior to the start of the procedure and usually equals the size of the main sample, unless bootstrap subsampling is performed, in which case a fraction of the original sample is selected.[189] Bootstrap subsampling is often utilized with large datasets and when traditional bootstrapping procedures fail. The number of replications, or the number of times a new sample is created, is also determined a priori and usually ranges from 100-1000, or more.[143,190] Similar to MI, the bootstrap samples are pooled, which creates a sampling distribution and facilitates the computation of parameter estimates, standard errors and confidence intervals.[191]

Bootstrapping has been found to provide more stable estimates than the jackknife procedure.[143,186,192] While the jackknife procedure is particularly effective at reducing bias through the identification of outliers, bootstrapping can provide more comprehensive and accurate estimates for a given sample or set of samples. In Aims 2 and 3 of this dissertation bootstrapping was utilized as a validation technique to ensure that model results were consistent when performed on smaller and different samples.

Chapter 4: Conceptual Framework

The first aim of this study is guided by a theoretical framework developed by Schneider and Jacoby that sought to explicate the impact of external influences on bureaucratic policy making.[193] The findings from this analysis provided a theoretical foundation for the selection of state-level factors utilized in the development of models for Aims 2 and 3 of this study.

Medicaid is a combined federal/state program, with the federal government and state governments sharing the costs of Medicaid services, depending upon the per capita income of the state, among other factors.[128] The federal government issues guidelines on "mandatory services" that states must cover, such as inpatient hospital stays, physician visits, as well as several other services; however, states can choose whether to cover "optional services", which include prescription drugs and dental services, among other services.[194] The decision regarding what optional services state Medicaid programs will cover ultimately lies with state Medicaid administrators. Given the magnitude of this decision and the variability in coverage across states, Schneider and Jacoby sought to understand the factors that influence the number of optional services covered by states. To do this, Schneider and Jacoby developed and tested a theory that posited four levels of influence on Medicaid policy making: elected officials, interest groups, structural influences and state-level environmental conditions.[193] Schneider and Jacoby believed that elected officials have the potential to influence Medicaid decision-making due to the fact that governors and/or legislatures are responsible for appointing state Medicaid directors. [195] Because of this, Schneider and Jacoby tested the influence of two variables at the elected officials' level that have been found to be influential in other relevant research: legislative partisanship, which they defined as the percent of Democrats in both the Senate and the House of Representatives or Assembly; and, the incumbent governor's party affiliation.

At the interest group level, Schneider and Jacoby included four variables to assess the influence of interest groups on the inclusion of Medicaid optional services: the proportion of physicians, dentists, hospital beds and nursing home beds within a state. These variables were chosen because they represented a wide cross-section of parties that might be interested in and lobby for specific optional services.

Structural influences, Schneider and Jacoby posited, may also play a significant role in influencing decisions regarding the coverage of Medicaid optional services. They operationalized these

structural influences through the inclusion of the previous year's Medicaid expenditures, given that these expenses may impact decisions about future spending. Additionally, they believed the FMAP rate may also influence the extent to which states include optional services given that it is an indication of the payment contribution of the federal government. The final structural influence included in their model was whether Medicaid programs are controlled by state or local administrations. In some states, decision making regarding Medicaid lies solely at the state level, whereas in other states, Medicaid decision making has devolved to county officials as well. Schneider and Jacoby hypothesized that in states with local administration involved in the decision making, bureaucrats may have a better handle on the needs of their communities and therefore be more likely to include optional services that reflect the need of the population.

The final group of potential influences in their model was environmental factors. These factors were chosen to account for the conditions within a state that may influence Medicaid directors' decision making, including need, economics and ideology. Schneider and Jacoby operationalized need through the use of state infant mortality rate as an indicator of the overall health of the population. Per capita income was chosen to reflect the economic condition of the state, and the ideological leaning of the state was operationalized through the use of survey data measuring the extent to which state residents lean conservative or liberal.

Schneider and Jacoby assessed the strength of their framework by testing the extent to which the aforementioned independent variables explained the variability across states regarding the total number of optional services adopted. Schneider and Jacoby found that per capita state income, FMAP rate, the proportion of physicians and dentists, state versus local Medicaid administrators and infant mortality rate were all significant factors that influenced the adoption of Medicaid optional services across states.[193]

Schneider and Jacoby were interested in understanding the influences on the volume of optional services states covered; however, this study is focused on the influences for two specific optional services, methadone and buprenorphine treatment. While some forms of substance use treatment are considered mandatory under federal Medicaid guidelines, such as inpatient detoxification, methadone and buprenorphine are optional. Given the fact that methadone and buprenorphine are the two most effective treatments for opioid dependence, it is unclear why only a portion of states provide coverage for these treatments.

Due to limitations on the availability of relevant factors, this study utilizes an adapted version of Schneider and Jacoby's framework to test the correlation of two levels of influence on Medicaid restrictions of methadone and buprenorphine coverage: economic and need. Economic factors will be operationalized through the use of the following state-level variables: FMAP rate, percent of residents receiving Medicaid, per capita income, annual state expenditures and the amount of federal block grant funding for substance use treatment. Finally, need factors will be operationalized through the following state-level indicator: the number of substance use treatment facilities in each state and the number of opioid dependent individuals in each state.

Chapter 5: State-level Analysis of Economic and Need Factors and Medicaid Coverage of Methadone and Buprenorphine Treatment in the United States (Aim 1 Analysis)

Background

Opioid Dependence

Substance use treatment admissions for opioid dependence have increased 71% between 1998 and 2012, due to a large increase in the nonmedical use of prescription opioids and heroin.[1,126,196] By 2013, 4.5 million Americans reported nonmedical use of prescription opioids within the previous month and close to 300,000 people reported heroin use within the previous month.[16] Both nonmedical prescription

opioid use and heroin use have been associated with dramatic increases in the number of fatal drug overdose deaths in the United States. Between 2001 and 2013, fatal drug overdoses that were that result of nonmedical use of prescription opioids tripled and those associated with heroin increased by fivefold.[197]

Expanding access to evidence based treatments for opioid dependence, particularly methadone and buprenorphine, is a critical step in stemming the growing tide of opioid dependence and the negative health consequences associated with it.[198] While methadone and buprenorphine are considered to be the most effective forms of treatment for opioid dependence, public and private insurance programs are not required to cover these treatments. This study examines the association between two sets of factors, economic and need, and state Medicaid coverage or methadone and buprenorphine.

Medicaid Coverage of Methadone and Buprenorphine

Medicaid is a combined federal/state program that provides health insurance for low-income individuals and families. The federal government offers guidelines to states regarding the extent to which medical services and medications should be covered under Medicaid. Ultimately, however, each state develops their own eligibility requirements, as well as coverage parameters for medical care and medications.[124] As a result of state autonomy, there is substantial variability in substance use treatment coverage across states, particularly for methadone and buprenorphine. In some states, for example, Medicaid covers either buprenorphine or methadone; however, in other states, Medicaid covers both medications as long as they are provided in specific settings or after physicians have obtained preapproval. As of 2008, 19 states had some form of restriction on the coverage of buprenorphine and/or methadone.[9]

In 2014, substance use treatment became an Essential Health Benefit (EHB) under the Patient Protection and Affordable Care Act (PPACA). An EHB is a required set of health care services that every insurance plan sold in the Health Insurance Marketplace must cover. Additionally, new Medicaid beneficiaries now covered in states that have opted to expand their Medicaid programs will be entitled to receive substance use treatment as part of their essential benefits. This new EHB status provides significant hope for increased access to substance use treatment services; however, these changes are not likely to decrease the variability in Medicaid coverage of methadone and buprenorphine. State Medicaid programs will continue to have great latitude in choosing the types of substance use treatment services that will be covered. Additionally, while Medicaid expansion has the potential to increase access to substance use treatment, the expansion in services in some states will only apply to new Medicaid beneficiaries and not those that were receiving Medicaid prior to January 1, 2014.[199,200] This study sought to gain a better understanding of Medicaid coverage variability for methadone and buprenorphine in the United States, focusing on two main categories of predictors: the need for treatment and the economic environment of the state. To guide the selection of relevant independent variables, we utilized an adapted framework from a study investigating factors associated with state coverage of Medicaid optional services.[193]

Methods

An historical analysis of publicly available data was conducted using a variety of sources. An explanation of study variables and sources follow.

Independent Variables

The independent variables chosen as economic predictors in this study include: state Federal Medical Assistance Percentages (FMAP) rate, percent of residents in each state receiving Medicaid, per capita income of each state, state expenditures and the amount of substance abuse block grant funding.

The need predictor variables used in this study include: the rate of people seeking opioid treatment in each state and the rate of methadone and buprenorphine programs in each state. Each variable was examined separately to determine whether it was correlated with state Medicaid coverage of methadone in 1998, 2008 and 1998-2008 combined, and Medicaid coverage of buprenorphine in 2006, 2008 and 2006-2008 combined.

Federal Medical Assistance Percentages (FMAP)

The Federal Medical Assistance Percentage is the proportion of funds that the federal government contributes to each state's Medicaid program. The FMAP rate varies by state, however, the average FMAP rate is 57%, meaning that the federal government pays 57% of Medicaid costs. While the FMAP rate is never lower than 50%, in 2013 it was over 70% for Arkansas, the District of Columbia, Idaho, Kentucky, Mississippi, South Carolina and West Virginia.[129] FMAP rates for this study were obtained for fiscal years 1998, 2006 and 2008 from the Department of Health and Human Services.[130]

Residents receiving Medicaid

Data regarding Medicaid beneficiaries were obtained from the Centers for Medicaid and Medicare (CMS), Medicaid Statistical Information System. The total number of beneficiaries was obtained for each state and then the proportion of residents receiving Medicaid was calculated using population totals obtained from the United States Census. Data were obtained for 1999 (1998 Medicaid beneficiary data were not available), 2006 and 2008.

State Per Capita Income

Per capita income was obtained from the US Department of Commerce, Bureau of Economic Analysis for 1998, 2006 and 2008, and was based on the total personal income in each state, divided by the total midyear population.

State Expenditures

State expenditure data include expenses paid by states for education, public assistance, Medicaid, corrections, transportation and capital expenses, among other categories. Expenditure data were obtained from the National Association of State Budget Officers for fiscal years 1998, 2006 and 2008.

Substance Abuse Prevention and Treatment Block Grant (SABG) funding

SABG funds provide states with the opportunity to address their substance use prevention and treatment needs in ways that are unique to their communities. The services funded by SABG vary by state, as does the amount each state receives. SABG data were obtained from the Substance Abuse and Mental Health Services Administration for fiscal years 2006 and 2008 (1998 data were not available). Data used for this study was limited to substance use treatment block grant funds, and excluded the total amount awarded for substance use prevention.

Rate of Individuals Seeking Opioid Treatment

The number of individuals seeking opioid treatment in 1998, 2006 and 2008 was obtained from the Treatment Episodes Data Set – Admission (TEDS-A). TEDS-A data include all drug treatment admissions from public and private substance use treatment programs that receive public funding. TEDS-A data are based on encounters in substance use treatment, rather than distinct individuals. For these analyses, TEDS-A data were limited to individuals seeking substance use treatment services with heroin or prescription opioids reported as their primary, secondary or tertiary substance of abuse. In

order to standardize the number of opioid dependent individuals across states, a treatment rate of opioid dependent individuals per 10,000 population was calculated based on the number of opioid dependent individuals and population of each state.

Rate of Methadone and Buprenorphine Programs

The number of opioid treatment programs were obtained from the Uniform Facility Data Set (UFDS) for 1998, and the National Survey of Substance Abuse Treatment Services (N-SSATS), formerly known as the UFDS, for 2006 and 2008. The UFDS and N-SSATS include all private and publicly funded substance use treatment programs in the United States. The UFDS and N-SSATS data used for this study were limited to the total number of programs providing methadone in 1998 or 2008 and buprenorphine in 2006 and 2008. In order to standardize the number of programs per state, a program rate of programs per one million population was calculated based on the number of methadone and buprenorphine programs (calculated separately) and the population of each state.

Dependent variables

Medicaid Coverage of Methadone and Buprenorphine

State Medicaid coverage of methadone for 1998 and 2008 was obtained from two sources. For 1998, data were obtained from McCarty et al's study, "Methadone Maintenance and State Medicaid Managed Care Programs".[142] For 2008, Medicaid coverage of methadone by state was obtained from the State Financing for Medication Assisted Treatment study.[9]

State Medicaid coverage of buprenorphine in 2006 was gathered from Ducharme at al's study, "State policy influence on the early diffusion of buprenorphine in community treatment programs".[54]

Data for Medicaid coverage of buprenorphine in 2008 were obtained from the State Financing for Medication Assisted Treatment study.

Analytic Approach

Bivariate logistic regression was used to assess the relationship between economic and need factors and Medicaid coverage of methadone in 1998, 2008 and 1998-2008 combined and buprenorphine in 2006, 2008 and 2006-2008 combined. The study timeframe was determined based on the availability of state-level Medicaid coverage of methadone and buprenorphine. The analyses included combined years for each treatment as well as analyses separated by study year in order to determine whether associations between the predictor variables and Medicaid coverage of each treatment remained significant when study years were assessed separately.

Predictor variables were standardized by dividing each mean score by the standard deviation in order to create a common scale. Economic and need factors were then assessed in separate bivariate analyses by predictor variable, year and type of treatment (methadone and buprenorphine). For all study years, Medicaid coverage of methadone and buprenorphine were dichotomized as yes/no. The final sample for each analysis year was confined to only those states with data available for all of the independent and dependent variables in the given year. The analytic samples are depicted in Figure 1.3. All statistical analyses were performed using SAS 9.3 (SAS Institute, Cary, NC). The study was determined exempt by the City University of New York's Human Research Protections Program Office due to the use of publicly available data.

Results

Table 1.1 displays Medicaid coverage by state for methadone in 1998 and 2008 and buprenorphine in 2006 and 2008. In 1998, 25 states provided Medicaid coverage of methadone, as compared with 34

states in 2008. In 2006, 28 states provided coverage of buprenorphine for Medicaid beneficiaries, as compared with 38 states in 2008. A total of eleven states did not cover methadone for Medicaid beneficiaries in either 1998 or 2008 and six states did not cover buprenorphine for Medicaid beneficiaries in either 2006 or 2008. Finally, five states did not cover either methadone or buprenorphine for Medicaid beneficiaries in 2008.

The results of the bivariate logistic regression models for both treatments across study years are presented in Table 1.2.

Economic Factors

State FMAP rate was negatively associated with Medicaid coverage of both methadone and buprenorphine across all study years. In 1998, for every one standard deviation increase (8.34%) in the FMAP rate, the odds of a state providing Medicaid coverage of methadone decreased by 64%. Comparable negative relationships were noted across all study years for methadone. Similarly, in 2006, for every one standard deviation increase (7.86%) in the FMAP rate, the odds of a state providing Medicaid coverage of buprenorphine decreased by 62%.

Per capita income was also significantly associated with Medicaid coverage of methadone and buprenorphine across all study periods. In 1998, the odds of a state providing Medicaid coverage of methadone increased by a factor of two for every one standard deviation ($3,623) increase in per capita income, and in 2006, for every one standard deviation increase ($5,261) in per capita income, the odds of a state providing coverage of buprenorphine more than doubled (OR=2.11).

The association between annual state expenditures and methadone and buprenorphine was inconsistent across study time periods for both methadone and buprenorphine. While state expenditures were associated with Medicaid coverage of methadone in 1998 (p=0.016) and in 19982008 (p=0.001), the relationship was not significant in 2008. For buprenorphine, annual state expenditures were associated with buprenorphine coverage in the combined 2006-2008 analysis

(P=0.048), but not in 2006 or 2008.

The relationship between Substance Abuse Block Grant funding (SABG) and Medicaid coverage of methadone and buprenorphine was assessed for 2006 and 2008 (1998 data were not available) but was not found to be significant in any of the analyses. Finally, the percent of residents receiving Medicaid was not associated with Medicaid coverage of methadone or buprenorphine in any study time period.

Need Factors

The rate of individuals in opioid treatment was only associated Medicaid coverage of methadone in the 1998-2008 analysis. This finding suggests that for every 18 additional individuals/10,000 population being treated for opioid dependence, a state was 9.68 times more likely to cover methadone treatment for Medicaid beneficiaries.

Finally, the rate of methadone programs per one million population and Medicaid coverage of methadone were significantly associated in all three time periods (no associations were observed for buprenorphine). In 1998, for example, for every 2 additional methadone programs per one million people in the population, a state was six times more likely to cover methadone treatment for Medicaid beneficiaries.

Discussion

The main finding of this study is the significant associations observed between two measures of state wealth, FMAP rate and per capita income, and Medicaid coverage of methadone and buprenorphine. A negative relationship between FMAP rate and Medicaid coverage of methadone and buprenorphine was noted across all study time periods, demonstrating that states with greater financial need were less likely to provide Medicaid coverage of methadone and buprenorphine. Similarly, a positive association was found between per capita income across all study time periods, demonstrating

that states with greater financial resources were more likely to cover methadone treatment than states with less financial resources.

The associations between annual state expenditures and Medicaid coverage of methadone and buprenorphine are difficult to interpret given their lack of consistency across study years and treatment type; however, the lack of association found for both percent of residents receiving Medicaid and the total amount of funding received from SABG have an interesting commonality. These two measures are both very specific; one regarding Medicaid itself and the other regarding substance use funding. Unlike per capita income and annual state expenditures, which are measures that include input from all members and sectors of the state, and the FMAP rate which is calculated in part based on per capita income, the percent of Medicaid recipients is not a broad based measure of a state's economy, but rather an economic indicator of a portion of a state's economy. As such, the percent of residents receiving Medicaid may not have a significant impact on the overall financial standing of the state. For instance, it is feasible for a state to have a large disparity in the wealth of its residents, which may result in a moderately large percentage of residents receiving Medicaid, but may not impact the overall economy of the state if there is an equally sizeable segment of the state population with above average wealth. Similarly, the SABG funding proxy measure provides a very narrow measure of the wealth of a state, with its only use being for those programs and services that are specifically related to substance use treatment. Again, such a narrow economic indicator may not be broad enough to impact the overall financial standing of a state. Additionally, if a state receives an above average amount of SABG funding, this may actually serve as marker of a greater need for substance use treatment rather than an indicator of economic need. Given this possibility, future analyses may consider using SABG as an indicator of need rather than as an economic factor.

The findings regarding need factors were inconsistent both within and across treatments. While there was evidence of a significant relationship between the rate of methadone programs and Medicaid

coverage of methadone, the confidence intervals associated with these odds ratios were large. Similarly, the confidence intervals regarding the rate of individuals in treatment for opioid dependence and Medicaid coverage of methadone, which may indicate that the relationship between these variables is weak. While the need factors and buprenorphine findings are somewhat consistent with those observed in the methadone analyses, the N-SSATS data did not include private physicians that are not affiliated with substance use treatment programs, which undoubtedly impacted the significance of these analyses. It is not known, however, whether these associations would become significant if the dataset were to include private physicians that prescribe buprenorphine. Future research in this area might utilize a dataset that provides a better indicator of the proportion of buprenorphine programs *and* providers.

Each annual analysis conducted in this paper (1998, 2006 and 2008) contained a sample of less than fifty states. The small sample size undoubtedly impacted the strength of the associations because when study years were combined, and therefore the sample size increased, nearly every association increased in significance. This may provide further evidence that a larger sample size could increase the strength of the relationships between each of the economic variables, and reduce the confidence intervals; however, this limitation is in inherent in state-level analyses.

While these analyses are historical, and do not include any time period since the PPACA was enacted, the findings of this study remain significant within the context of PPACA implementation. As mentioned previously, the PPACA has not changed the accessibility of methadone and buprenorphine directly. While substance use treatment has become an essential health benefit under the PPACA, states continue to choose the types of treatments their Medicaid programs will cover. Given this, it is very likely that the variability in Medicaid coverage of substance use treatment services that was observed in this study will persist post-PPACA implementation, resulting in inconsistent access to these evidencebased treatments.

Finally, this study investigated Medicaid coverage of methadone and buprenorphine as a dichotomous outcome. Other studies have investigated the accessibility of these treatments in terms of degrees.[9] For instance, in some states Medicaid coverage of methadone and buprenorphine is unrestricted, while in other states Medicaid programs put limits on the length of time a patient can be covered, require prior authorization for these treatments, and delay reimbursement to practitioners and programs by not putting these treatments on Medicaid formulary lists. Such restrictions are permissible under the PPACA, but may create additional barriers to both the provision and utilization of these treatments. Future research should investigate the extent to which environmental factors within a state are associated with different types of Medicaid restrictions of methadone and buprenorphine, and determine the extent to which these restrictions influence access to methadone and buprenorphine treatment.

Limitations

Data regarding Medicaid coverage of methadone and buprenorphine by state were not available for consecutive years. This limited my ability to detect the direct impact when a policy changed. Given this limitation, particularly for need factors, it is not possible to determine whether Medicaid policy regarding coverage of methadone and buprenorphine led to an increase or decrease in the number of methadone and buprenorphine programs or individuals seeking treatment for opioid dependence. The findings presented in this paper simply indicate that some of the factors examined were associated. Future studies on this topic might investigate Medicaid coverage of methadone and buprenorphine over multiple, consecutive years in order to detect distinct changes in policy that could help to isolate causal factors.

This study utilized data from the TEDS-A, which includes only those individuals enrolled in substance use treatment, to investigate the association between the need for treatment and Medicaid coverage of these treatments. The number of people enrolled in treatment was used as one proxy measure for need, but the associations observed were weak. A better proxy measure for future research might include the rate of opioid dependence derived from a population-based sample so that individuals in and out of substance use treatment can be captured.

The majority of privately owned treatment facilities, which according to SAMHSA account for approximately twenty-nine percent of outpatient methadone programs in the United States, are not included in the TEDS data.[201] Additionally, individuals treated through private physicians that are not contained within a substance use treatment facility are not included in TEDS.[202] The exclusion of treatment programs not receiving public funds and private physicians may provide an underrepresentation of the rate of methadone and/or buprenorphine programs and therefore bias the results towards the null.

Conclusion

Although methadone and buprenorphine are the two most effective treatments for opioid dependence, their use in the United States is limited. Previous research has investigated the influence of health insurance coverage, regulatory issues governing these treatments and physician training, among other factors, as potential reasons for the limited use of these treatments. This study expanded on previous research regarding the role of health insurance coverage by investigating the extent to which the economic condition of states and the significance of opioid dependence in states was associated with differences in Medicaid coverage of methadone and buprenorphine. This study provides evidence that states with increased wealth are more likely to provide Medicaid coverage of methadone and buprenorphine than states with less overall wealth. While the findings regarding the need for treatment

were inconsistent, future research should investigate these associations utilizing additional variables that may serve as better proxy measures for the significance of opioid dependence in a state.

Finally, given the sustained increase in opioid use and associated mortality in the United States over the last decade, it is critical to ensure that evidence based treatments are accessible to all individuals in need. While passage of the PPACA and the inclusion of substance use treatment as an EHB provide hope for the expansion and increased accessibility of substance use treatment, states will continue to have the authority to choose the types of treatments covered under their Medicaid programs. Identifying the factors that are associated with states that cover these treatments, and those that do not, is an important step toward increasing the accessibility of these evidence based treatments.

Chapter 6: Medicaid Coverage of Methadone and Buprenorphine and Waiting Time to Enter Substance Use Treatment (Aim 2 Analysis)

Background

Opioid use has increased significantly over the last decade.[3,203] As of 2013, an estimated 2.4 million people were considered to be dependent on opioids; however, according to current estimates, only 2025% of opioid dependent individuals receive some form of treatment.[204] Untreated opioid dependence is associated with significant health consequences, including HIV and hepatitis C infection, drug overdose, injection drug use, and unsafe sex and drug behaviors.[24–31] Medication assisted treatments (MAT), such as methadone and buprenorphine, are the most effective form of treatment for opioid dependence.[4,5,47,48] MAT have been associated with reductions in HIV infection, mortality, crime, injection drug use, heroin use, and syringe sharing.[38–40,43,205,206] In order to address the epidemic of opioid use and reduce the public health consequences associated with it, experts have called for an increase in access to MAT.[198]

Substance use treatment that is readily accessible can have a significant impact on both engagement and retention in treatment. When individuals are required to wait to enter treatment, they are at increased risk for treatment dropout,[104] mortality,[106] arrest,[107] untreated psychiatric problems,[108] new HIV infection,[109] and a return to or initiation in injection drug use (IDU).[110] Further, an inverse relationship between the time a person waits to enter treatment and treatment entry has been observed in several studies, such that the longer a person waits to enter treatment, the less likely they are to enroll in it.[92,95,111–113] Research suggests that the first twenty four hours following a client's initial contact with a substance use treatment program is the most critical period as it results in the largest decrease in program enrollment.[92]

Factors Associated with Treatment Wait Time

Treatment wait time, which is defined here as the lag between when a person attempts to enter substance use treatment and actual treatment entry, is frequently cited as a primary barrier to initiating substance use treatment.[90–93] Factors contributing to treatment wait time may be the result of delays related to individuals, organizations or structural factors. Individual-level factors such as unemployment[96], homelessness[96], being African American[103,116], cocaine use[103,106], lack of insurance[94] and psychiatric problems[103] have all been associated with longer wait times for treatment entry. The associations between age[96,106,117] and gender [100,102,105] and treatment wait time have been inconsistent.

While individual-level factors may contribute to delays in treatment entry, they are not believed to have a significant impact on treatment wait time.[90,98] Rather, organizational factors, particularly regarding program inefficiencies, are believed to contribute most significantly to wait times.[118–121] Specific organizational factors associated with delays to treatment entry include larger client caseload[96,123], staff shortages,[92] provision of methadone[116], inefficient phone scheduling systems[99], central intake units[94] and increased proportion of clients receiving public assistance[123]; whereas forprofit

programs[117], programs with an increased number of patients attending daily[96] and programs with performance contracting[101], or financial incentives for improvement in patient outcomes or organizational efficiencies, have been associated with reduced treatment wait times.

There is scant literature regarding the influence of structural factors on treatment wait time. The only study that we found was an investigation of systems-level and individual-level characteristics by Carr et al.[96] This study found that bureaucratic delays related to processing court-ordered treatment resulted in increased wait times for substance use treatment entry.[37]

The main purpose of this study is to investigate the association between state Medicaid coverage of methadone and buprenorphine and the length of time individuals wait to enter substance use treatment. This study includes individual-level demographic variables and program-level characteristics that have been observed in the literature. In addition, this study explores the contribution of several other structural factors in addition to Medicaid coverage of methadone and buprenorphine. Utilizing an adapted framework from a study investigating the factors associated with state coverage of Medicaid optional services, this study includes structural factors related to the economic environment and the need for treatment within states.[193] These variables include the percent of residents receiving Medicaid in each state, per capita income of each state, the rate of opioid dependent individuals enrolled in substance use treatment and the rate of methadone or buprenorphine programs in each state.

Methods

The primary objective of this study is to provide an individual-level investigation of the association between Medicaid coverage of methadone and buprenorphine and treatment wait times. We hypothesize that individuals enrolled in substance use treatment programs in states with Medicaid coverage of methadone and buprenorphine will experience shorter wait times to enter treatment.

The main predictor of interest in this study is whether the state in which a person sought treatment provided Medicaid coverage for methadone or buprenorphine (examined separately) in 1998 and 2008 for the methadone analysis and 2006 and 2008 for the buprenorphine analysis. Additional independent variables include both individual-level demographic variables, program-level characteristics and structural variables. The structural variables served as state-level fixed effects estimators in order to help account for the unobserved heterogeneity of the state environment when examining the effect of state Medicaid policy. A detailed description of each of these variables is provided below. Finally, the dependent variable is the amount of time an individual waited to enter substance use treatment.

Analytic Sample

Individual level data regarding admission to substance use treatment in 1998, 2006 and 2008 were obtained from the Treatment Episodes Data Set-Admissions (TEDS-A), an administrative data set containing annual admissions of individuals 12 years of age and older to licensed substance use treatment programs in the United States.[126] TEDS-A data are publicly available through the Substance Abuse and Mental Health Data Archive (SAMHDA).[127] The TEDS-A data represent annual encounters in substance use treatment, rather than individual clients, such that if a single individual had multiple episodes in substance use treatment programs in a given year, each treatment episode is counted separately.

Once TEDS-A data were obtained, separate methadone and buprenorphine datasets were created by matching structural variables with the state indicator variable representing the state in which a person sought substance use treatment. State matching was carried out for each study year and then merged into a final dataset for each treatment type containing both study years. The final methadone

dataset contained data for 1998 and 2008 and the final buprenorphine dataset contained 2006 and 2008 data. The unit of analysis in each final dataset was person-year.

A description of the analytic sample is provided in Figure 2A.1. For the methadone analyses, the sample for each study year was restricted to individuals enrolled in any type of substance use treatment in 1998 and 2008 in the following fourteen states for which there were sufficient data available for the outcome of interest, main predictor variables and the combined year analyses: Arizona, Colorado, Florida, Hawaii, Idaho, Iowa, Kansas, Louisiana, Montana, New Hampshire, New Mexico, Ohio, South Carolina and Wyoming.

For the buprenorphine analyses, there were 24 states with sufficient data available for the outcome of interest, main predictor variables and the combined year analyses. The buprenorphine sample included individuals enrolled in any type of substance use treatment in 2006 and 2008 in Arizona, Arkansas, California, Colorado, Florida, Hawaii, Idaho, Illinois, Iowa, Kansas, Louisiana, Maryland, Michigan, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Ohio, South Dakota, Utah and Wyoming.

Independent Variables

Individual and Program-Level Variables

Individual and program-level variables obtained from the TEDS-A for both the methadone and buprenorphine analyses included sex, age, race, gender, education, marital status, income, unstable housing, drug use, psychiatric problems, treatment type, provider type and insurance coverage.

Structural variables

Structural variables included the percent of residents in each state receiving Medicaid, per capita income of each state, rate of opioid dependent individuals enrolled in substance use treatment,

rate of methadone or buprenorphine programs in each state and state Medicaid coverage of methadone and buprenorphine. Each continuous structural variable (percent of residents in receiving Medicaid, per capita income, rate of opioid dependent individuals enrolled in treatment and the rate of methadone or buprenorphine programs) was standardized by dividing the mean score by the standard deviation in order to create a common scale. A description of each structural variable follows.

Percent of Residents Receiving Medicaid

Data regarding Medicaid beneficiaries were obtained from the Centers for Medicaid and Medicare (CMS), Medicaid Statistical Information System. The total number of beneficiaries was obtained for each state and then the proportion of residents receiving Medicaid was calculated using population totals obtained from the United States Census. Data were obtained for 1999 (1998 Medicaid beneficiary data were not available), 2006 and 2008.

State Per Capita Income

Per capita income was obtained from the US Department of Commerce, Bureau of Economic Analysis for 1998, 2006 and 2008, and was based on the total personal income in each state, divided by the total midyear population.

Rate of Opioid Dependent Individuals Enrolled in Substance Use Treatment

The number of opioid dependent individuals receiving substance use treatment was gathered from the TEDS-A data set for the years 1998, 2006 and 2008. In order to standardize the number of individuals per state, a treatment rate of individuals per 1 million population was calculated based on the number of opioid dependent individuals in any type of substance use treatment each year and the population of each state.

Rate of Methadone and Buprenorphine Programs

The number of opioid treatment programs was obtained from the Uniform Facility Data Set (UFDS) for 1998, and the National Survey of Substance Abuse Treatment Services (N-SSATS), formerly known as the UFDS, for 2006 and 2008. The UFDS and N-SSATS include all private and publicly funded substance use treatment programs in the United States. The UFDS and N-SSATS data used for this study were limited to the total number of programs providing methadone in 1998 or 2008 and buprenorphine in 2006 and 2008. In order to standardize the number of programs per state, a program rate of programs per 10,000 population was calculated based on the number of methadone and buprenorphine programs

(calculated separately) and the population of each state.

Medicaid Coverage of Methadone and Buprenorphine

State Medicaid coverage of methadone for 1998 and 2008 was obtained from two sources. For 1998, data were obtained from McCarty et al's study, "Methadone Maintenance and State Medicaid Managed Care Programs".[142] For 2008, Medicaid coverage of methadone by state was obtained from the State Financing for Medication Assisted Treatment study. [9] For both study years, Medicaid coverage of methadone was dichotomized as yes/no.

State Medicaid coverage of buprenorphine in 2006 was gathered from Ducharme at al's study, "State policy influence on the early diffusion of buprenorphine in community treatment programs".[54] Similar to the 2008 data used for methadone, data for Medicaid coverage of buprenorphine in 2008 were obtained from the State Financing for Medication Assisted Treatment study. Finally, similar to methadone, Medicaid coverage of buprenorphine was dichotomized as yes/no for both 2006 and 2008.

Dependent variable

Wait time for entrance into substance use treatment was gathered from TEDS-A for 1998, 2006 and 2008. The TEDS-A defines wait time as the number of days a person waited to enter a treatment facility, based on the time of their initial request for treatment entry and the time that they were admitted to the program. The TEDS-A definition is based solely on delays due to treatment capacity, availability, or requirements due to admission or other programmatic factors. This wait time variable includes only successful admissions to treatment and does not reflect delays that were the result of individual factors, such as unavailability or failure to meet an obligation.

Analytic Approach

Descriptive statistics were calculated to determine the distribution of the outcome variable, treatment wait time. Univariate analysis indicated that treatment wait time was heavily skewed towards zero (range=0-996; mean=5.13, median=0, mode=0, variance=608). Poisson Regression (PR), Negative Binomial Regression (NBR) and Zero-Inflated Negative Binomial Regression (ZINBR) were all considered for modeling the relationship between the predictor variables and treatment wait time. Given the overdispersion of the treatment wait time variable, and the fact that PR could lead to false significance when overdispersion is evident, PR was ruled out.[207,208] While ZINBR can be utilized for models with an excess of zeros, it assumes that the zeros come from two sources, sampling (those that occur by randomly) and structural (those that occur through systematic error); thus, the zeros are modeled differently based on these assumptions.[209] The zeros reported for treatment wait time in the TEDS dataset are not believed to be subject to any systematic bias and therefore should not be modeled separately. Given the inappropriateness of both PR and ZINBR for these analyses, and the fact that NBR has more flexibility in handling overdispersion, NBR was selected.

Bivariate NBR was used to assess the unadjusted association between the main predictor of interest, Medicaid coverage of methadone and buprenorphine, and the amount of time individuals waited to enter substance use treatment. Multivariable NBR was then used to model the relationship between the remaining predictor variables and wait time for treatment entry in a stepwise fashion. Models were developed for each treatment type by single study year and combined study years (only the combined year analyses are presented here). An interaction term of Medicaid coverage and time (Medicaid coverage*time) was added to each combined year model to account for the combined effects of these variables on treatment waiting times. To assist with the interpretation of the NBR estimates, □□coefficients in each model were transformed using the formula: $(e^{\square}-1)(100)$ to provide the percent change in the number of days spent waiting to enter treatment, given a one unit difference in the predictor variable.

All statistical analyses were performed using SAS 9.3 (SAS Institute, Cary, NC). Associations were considered statistically significant at the $p<.05$ level. The City University of New York's Human Research Protections Program Office approved this study.

Missing Data

Missing data can be categorized in three ways: missing completely at random (MCAR), missing at random (MAR) and missing not at random (MNAR). When data are MCAR, there are no distinguishable patterns of variables leading the data to be missing; thus, these data will not bias the estimated relationships given the fact that missingness occurs because of random events.[144,146–149] When data are MAR, the probability that the data are missing is based on observable characteristics within a study population but are not related to the outcome of interest.[147,148] Finally, when data that are MNAR occur when the probability that an item is missing is dependent upon unobserved information among a subset of participants.[147,148]

To explore missingness in this study, cases containing missing data were compared to those without missing data on all variables for each study year. The results of these comparisons revealed that the samples were significantly different on nearly every study variable, indicating that the data are not likely MCAR (Tables 2A.1, 2A.2, 2B.1 and 2B.2). While there is no test to determine whether data are MAR or MNAR, most missing data are treated as MAR.[150] Data in this study were treated as MAR and two missing data techniques were employed prior to analyses: Listwise Deletion (LD) and Multiple Imputation (MI). An a priori cutoff of no more than 55% missing data on any one variable served as the criteria for the inclusion of cases in this study. This criteria was chosen in order to balance geographic representation, sufficient variability in Medicaid coverage of methadone and buprenorphine and the inclusion of relevant covariates.

Listwise Deletion was carried out by eliminating all cases from each dataset that contained at least one missing value for any study variable. A dummy variable indicating missing data for any one of the variables of interest was created and the sample was then restricted based on those cases in which there were no missing data. Multiple imputation was performed using the Markov Chain Monte Carlo method in SAS 9.3 (SAS Institute, Cary, NC). While there is some disagreement regarding the inclusion of outcome variables in MI[181–183], the dependent variable, along with all other study variables, were included in the MI procedures in this study. Each single year dataset was imputed five times. LD and MI were performed for each single study year; however, only LD could be performed in the combined year analyses due to the very large sample size.

Resampling

The samples used for the methadone and buprenorphine analyses were very large, even after restricting by study criteria and to those individuals with complete case data. With such large data sets, the number of significant associations are likely to increase.[184] These associations, while statistically

significant, may have very small effect sizes, reducing the utility of the p-value as the sole basis for interpreting study findings.[185] To address this potential limitation, effect sizes and confidence intervals are presented alongside p-values in each model.[184]

Bootstrapping, a resampling technique used to validate non-normally distributed data, was performed on all LD samples to ensure that model results were consistent when performed on smaller and different samples. Bootstrapping was chosen because it is known to produce stable, unbiased estimates that demonstrate good internal validity, which is critical with large samples. Bootstrapping was employed using an unrestricted random sample of individuals from each single year and combined year LD dataset for each treatment type. Each sample was replicated in 100 separate datasets which were then combined to form a final sample for each study year and treatment.

The final models presented in this paper are from the combined year (1998-2008 for methadone and 2006-2008 for buprenorphine) bootstrapped LD analyses. The reader is referred to Tables 2A.62A.12 for the remaining combined year and single year methadone analyses, and Tables 2B.6-2B.12 for the remaining combined year and single year buprenorphine analyses.

Results

Figures 2A.1 and 2B.1 describe how the final analytic samples for the methadone and buprenorphine analyses were obtained. The demographic characteristics of the final combined 19982008 methadone and 2006-2008 buprenorphine LD bootstrapped samples that are presented in this paper are displayed in Tables 2A.3 and 2B.3, respectively.

Methadone Sample

A total of 26,100 people were included in the methadone sample. The sample was predominantly male (71%), white (73%) and non-Hispanic (88%). Almost two-thirds of the sample

completed high school (63%), one-quarter were married, 40% were employed and 40% were living in an unstable housing situation at the time of treatment entry. The majority of the sample was attending outpatient treatment (64%), 1% were receiving medication assisted treatment and 9% reported some form opioid use at admission. Finally, slightly less than half of the sample (43%) was enrolled in substance use treatment in states that provided Medicaid coverage of methadone. As shown in Table 2A.4, individuals receiving treatment in states with Medicaid coverage of methadone were more likely to be older, male, white, Hispanic, have a high school education, unstably housed, enrolled in a detoxification program, utilizing MAT, using heroin, using one drug at the time of admission, have private insurance, a pension, and seeking treatment in a state with greater per capita income and an increased number of methadone programs per 10,000 population.

Table 2A.5 describes the findings from the unadjusted and adjusted NBR models investigating the association between Medicaid coverage of methadone and the number of days a person waited to enter substance use treatment. Given the large number of significant findings across the models, only the main predictor variable of interest, Medicaid coverage of methadone, and those significant predictors with a percent change of 50% or greater are explored in detail.

Model 1 describes the results of the bivariate association between Medicaid coverage of methadone and the number of days a person waited to enter substance use treatment. This unadjusted association indicated that Medicaid coverage of methadone was associated with an 11% decrease in the number of days that individuals waited to enter treatment ($p=<0.001$).

Model 2 explored the relationship between Medicaid coverage of methadone and treatment wait time with the addition of demographic variables including sex, race, ethnicity, education, marital status, employment, unstable housing and age. Medicaid coverage of methadone was not significant in this model ($p=0.14$); however, both being Hispanic and less than 18 years of age, as compared with being over 45, were associated with treatment wait time. Hispanics experienced a 53% decrease in the

mean number of days they waited to enter treatment, as compared with non-Hispanics (p=<0.0001), and individuals that were less than 18 years of age experienced a 78% increase in the mean number of days they waited to enter treatment, as compared with individuals 45 years of age and over (p=<0.0001). Model 3 included all significant and non-significant variables from Model 2, as well as predictors related to substance use and treatment, including treatment program type, MAT use, psychological problems, the total number and type substances used at the time of treatment admission and whether the person was injecting drugs at the time of admission. The results of Model 3 indicate that, when controlling for demographic and drug-related variables, Medicaid coverage of methadone was negatively associated with treatment wait time, with individuals receiving treatment in states with Medicaid coverage of methadone experiencing a 15% decrease in the number of days they waited to enter treatment, as compared with individuals in states without Medicaid coverage of methadone (p=<0.0001). In addition to Medicaid coverage of methadone, Hispanic ethnicity remained negatively associated with treatment wait time (57% decrease in mean days; p=<0.0001), and being less than 18 years of age, as compared to individuals aged 45 and older, continued to be associated with an increase in treatment wait time (58% increase in mean days; p=<0.0001). Being enrolled in a detoxification program, as compared to a rehabilitation program, was associated with a 88% decrease in the mean number of days a person waited for treatment (p=<0.0001), and individuals receiving MAT experienced a 68% decrease in treatment waiting time, as compared to individuals not using MAT (p=<0.0001). Finally, individuals reporting benzodiazepine use experienced a 60% increase in the mean number of days they waited to enter treatment, as compared with non-benzodiazepine users (p=<0.001). Model 4 contained all of demographic and substance use variables from Models 2 and 3, in addition to health insurance coverage and primary source of income. Similar to Models 2 and 3, Medicaid coverage of methadone was associated with a 16% decrease in the mean number of days individuals waited to enter treatment, as compared to individuals in states without Medicaid coverage of methadone (p=<0.0001).

Hispanic ethnicity (56% decrease; p=<0.0001), enrollment in detoxification, as compared to rehabilitation (89% decrease; p=<0.0001), and MAT use (66% decrease; p=<0.0001), all continued to be associated with a reduction in the mean number of days waiting to enter treatment wait time. Being less than 18 years of age, as compared with individuals 45 and over (61% increase; p=<0.0001), using benzodiazepines (52% increase; p<0.05), having Medicaid, as compared to private insurance (63% increase; p=<0.0001), and having a retirement or pension as the primary source, as compared with a salary (72% increase; p=<0.0001), were all associated with increased wait time. In Model 5, structural variables related to the state environment, including per capita income, rate of methadone programs, rate of opioid dependent individuals in substance use treatment and the percent of Medicaid beneficiaries were added as fixed effects estimators to the demographic, substance use, health insurance and income variables included in Model 4. The addition of these state-level variables resulted in a change in the direction of the association between Medicaid coverage of methadone and treatment wait time. In Model 5, individuals receiving treatment in states with Medicaid coverage of methadone experienced a 90% increase in the mean number of days they waited to enter treatment, as compared with individuals receiving treatment in states without Medicaid coverage of methadone (p=<0.0001). This was the only significant variable in which the direction of the association changed in Model 5. Enrollment in a detoxification program, as compared to rehabilitation (92% decrease, p=<0.0001), and MAT use (67% decrease, p=<0.0001) remained negatively associated with treatment wait times, and reporting zero substances of abuse at treatment entry, as compared to three substances, was also associated with a decrease in treatment wait time (55% decrease, p=<0.0001). Finally, being under the age of 18, as compared to being 45 years of age or older (84% increase, p=<0.0001), and having a retirement or pension, as compared to a salary as the primary source of income (57% increase, p=<0.0001) were all associated with an increase in treatment wait time. In Model 6, time was added to account for differences between 1998 and 2008. In this model, time was associated with an

increase in treatment wait time, with individuals receiving treatment in 2008 experiencing a 239% increase in the mean number of days they waited for treatment, as compared with individuals in 1998 (p=<0.0001). The addition of time also strengthened the association between Medicaid coverage of methadone (123% increase, p=<0.0001), being under 18 years of age, as compared to being over 45 (99% increase, p=<0.0001), enrollment in detoxification, as compared to rehabilitation (92% decrease, p=<0.0001) and having no insurance, as compared to private insurance (60% increase, p=<0.0001) and treatment wait time. The associations between enrollment in MAT (67% decrease, p=<0.0001) and individuals whose primary source of income was retirement or pension, as compared to salary (57% increase, p=<0.0001) remained similar to the associations observed in Model 5.

Model 7 included all of the predictor variables used in Model 6, as well as the addition of an interaction term for Medicaid coverage and time. The interaction term was negatively associated with treatment wait time in this model, suggesting that Medicaid coverage of methadone impacted treatment wait time differently in 1998 than in 2008 (50% decrease, p=<0.0001). The addition of the interaction term to Model 7 increased the association between Medicaid coverage of methadone and treatment wait time, with individuals receiving treatment in states with Medicaid coverage experiencing a 219% increase in the amount of time they waited to enter treatment, as compared with individuals in states without Medicaid coverage of methadone (p=<0.0001). The interaction term also strengthened the association between time and treatment wait time, with individuals in the 2008 sample experiencing a 410% increase in the amount of time they waited to enter treatment, as compared with individuals in 1998 (p=<0.0001). Additionally, being under 18 years of age (92% increase, (p=<0.0001) as compared with individuals 45 and over, having no insurance, as compared to having private insurance (57% increase, p=<0.0001) and having a retirement or pension as your primary source of income, as compared with a salary (55% increase, p=<0.0001), were all associated with increased treatment wait times. Finally, being enrolled in a detoxification program, as compared with rehabilitation (92% decrease,

p=<0.0001), utilizing MAT (67% decrease, p=<0.0001), and reported no substances of abuse at treatment admission, as compared to individuals reporting three substances (51% decrease, p=<0.001), were all associated with reduced treatment wait times.

Buprenorphine Sample

As described in Table 2B.3, a total of 25,300 individuals were included in the buprenorphine sample. The sample was predominantly male (69%), white (66%) and non-Hispanic (89%). Almost two-thirds of the sample (64%) were high school educated and close to one-half (45%) reported an unstable housing situation at the time of treatment enrollment. Outpatient treatment was the most common form of treatment (59%), 5% of the sample was receiving either methadone or buprenorphine, and 20% of the sample reported using some form of opioids at the time of treatment enrollment.

As detailed in 2B.4, individuals who attended treatment programs in states with Medicaid coverage of buprenorphine were more likely to be black, other race, unstably housed, less than 18 years of age and over 34 years of age, be enrolled in an outpatient treatment program, utilize MAT, use heroin, opioids and crack, report two or fewer substances of abuse at the time of treatment admission, be covered by Medicaid, Medicare and private insurance, report public assistance, retirement/pension, other income and salary as their primary source of income, wait longer to enter substance use treatment and seek treatment in states with higher per capita income, an increased number of buprenorphine programs and a higher rate of individuals in substance use treatment.

Table 2B.5 presents the results from the unadjusted and adjusted NBR models investigating the association between Medicaid coverage of buprenorphine and treatment wait time. Similar to the methadone results, only the main predictor variable of interest, Medicaid coverage of buprenorphine, and those significant predictors with a percent change of 50% or greater will be explored in detail.
In the unadjusted analysis presented in Model 1, individuals receiving treatment in states with

Medicaid coverage of buprenorphine experienced a 75% increase in the mean number of days they waited to enter substance use treatment, as compared to individuals in states without Medicaid coverage of buprenorphine (p=<0.001).

Model 2 contained Medicaid coverage of buprenorphine along with the addition of demographic variables, including sex, race, ethnicity, education, marital status, employment, unstable housing and age. Medicaid coverage of buprenorphine continued to be associated with an increase in treatment wait time, as compared to individuals in states without Medicaid coverage of buprenorphine (82% increase, p=<0.001). In addition, being less than 18 (80% increase, p=<0.001), 18-24 (65% increase, p=<0.001) and 25-34 years of age (57% increase, p=<0.001) were all associated with an increase in the mean number of days individuals waited to enter substance use treatment, as compared to individuals over 44 years old. Model 3 contained Medicaid coverage of buprenorphine and demographic variables that were included in Model 2, as well as variables related to substance use and treatment, including treatment program type, MAT use, psychological problems, the total number and type of substances used at the time of treatment admission and whether the person was injecting drugs at the time of admission. Medicaid coverage of buprenorphine remained associated with an increase in treatment wait time (67% increase, p=<0.001). Additionally, attending detoxification programs, as compared with rehabilitation, was associated with a 70% decrease in treatment wait time (p=<0.001).

Model 4 contained all of the demographic and substance use and treatment variables from Models 2 and 3, in addition to health insurance coverage and primary source of income. In Model 4, Medicaid coverage of buprenorphine was associated with a 63% increase in the mean number of days individuals waited to enter treatment, as compared with individuals in states without Medicaid coverage of buprenorphine (p=<0.001). Similar to Model 3, detoxification program enrollment was associated with a 70% decrease in the mean number of days individuals waited to enter treatment, as compared to

rehabilitation programs (p=<0.001). Finally, having Medicare was associated with a 54% increase in treatment wait time (p=<0.001).

Model 5 contained all variables included in the previous models, with the addition of the following state fixed effects estimators: per capita income, rate of buprenorphine programs, rate of opioid dependent individuals in substance use treatment and the percent of Medicaid beneficiaries. The addition of the state-level fixed effects strengthened the association between Medicaid coverage of buprenorphine and treatment wait time, such that individuals receiving treatment in states with Medicaid coverage of buprenorphine experienced a 260% increase in the mean number of days they waited to enter substance use treatment, as compared with individuals in states without Medicaid coverage of buprenorphine (p=<0.001). In addition, the association between use of detoxification programs, as compared to rehabilitation programs, strengthened (82% decrease in wait time, p=<0.001), and the positive association between Medicare coverage and treatment wait time also became stronger (79% increase in wait time, p=<0.001). Finally heroin use was associated with a 67% increase in treatment wait time (p=<0.05).

In Model 6, time was added to the variables used as predictors in Model 5. Unlike the methadone analysis, time was not significant. The association between Medicaid coverage of buprenorphine and wait time remained significant in Model 6, with individuals receiving treatment in states with Medicaid coverage of buprenorphine experiencing a 267% increase in the mean number of days they waited to enter treatment, as compared with individuals in states without Medicaid coverage of buprenorphine. Finally, detoxification, as compared with rehabilitation, remained associated with a reduction in treatment wait time (82% decrease, p=<0.001) and heroin use (67% increase, p=<0.05) and Medicare coverage (79% increase, p=<0.001) were associated with an increase in treatment wait times.

In Model 7, the predictor variables used in Models 1-6 remained and an interaction term for Medicaid coverage and time was added. Unlike the methadone analysis, the interaction term was not

associated with treatment wait time, suggesting that Medicaid coverage of buprenorphine did not have a differential impact on treatment wait time across study years. The addition of the interaction term did, however, increase the association between Medicaid coverage of buprenorphine and treatment wait time. When accounting for the interactive effect of Medicaid coverage of buprenorphine over the two study time periods, individuals receiving treatment in states with Medicaid coverage of buprenorphine experienced a 344% increase in the amount of time they waited to enter treatment, as compared with individuals in states without Medicaid coverage of buprenorphine (p=<0.0001). Finally, similar to Models 5 and 6, detoxification, as compared with rehabilitation, was associated with decreased treatment wait time (82% decrease, p=<0.001), and heroin use (72% increase, p=<0.05) and Medicare (83% increase, p=<0.001) were associated with an increase in the mean number of days individuals waited to enter substance use treatment.

Discussion

This study tested the hypothesis that Medicaid coverage of methadone and buprenorphine would be associated with a reduction in the amount of time individuals waited to enter substance use treatment. The findings from the final models in this study do not support this hypothesis. For both methadone and buprenorphine treatment, state Medicaid coverage was associated with a significant increase in treatment wait time. The study hypothesis was driven by the expectation that Medicaid coverage of methadone and buprenorphine would increase the availability and accessibility of these treatments because more programs would offer these treatments and more individuals would utilize them. As described in Tables 2A.4 and 2B.4, in both the methadone and buprenorphine samples, there was an increased number of methadone and buprenorphine treatment programs per 10,000 population and an increased rate of opioid dependent individuals in substance use treatment in states with

Medicaid coverage of methadone and buprenorphine. While the rate of opioid dependent individuals in each state was accounted for, the wait time variable was calculated for all individuals seeking substance use treatment, regardless of the type of substance of abuse. Limiting this control to *only* those individuals that were opioid dependent in each state might account for this unexpected association, particularly because in the methadone analysis, the direction of the association shifted from a decreased wait time among individuals receiving treatment in states with Medicaid coverage of methadone to an increased wait time when these state-level control variables were added to the model.

Several of the findings from this study are consistent with the literature, including the associations between unemployment[96], unstable housing/homelessness[96], and lack of health insurance[94] and increased treatment wait time. Unlike other studies, this study did not find an increase in treatment wait times for blacks, cocaine users or individuals with psychological problems. Additionally, similar to previous studies in which findings regarding sex were mixed,[100,102,105] males in this study experienced increased wait times in the methadone analysis, but decreased wait times in the buprenorphine analysis. Similar to other studies, our findings regarding age were also inconsistent across the methadone and buprenorphine analyses.[106,117] In the methadone analysis, individuals less than 18 years of age experienced the longest treatment wait time, whereas individuals aged 25-34 experienced the longest wait time in the buprenorphine analysis. Finally, the strongest association found in this study was between time and treatment wait time in the methadone analysis, with individuals enrolled in substance treatment in 2008 waiting 410% longer to enter treatment than individuals enrolled in substance use treatment in 1998.

Limitations

Multiyear data regarding Medicaid coverage of methadone and buprenorphine by state were not available for consecutive years. This limited my ability to detect the direct impact of this policy,

particularly when the policy changed in some states. Given this limitation, it is not possible to determine whether Medicaid policy regarding coverage of methadone and buprenorphine led to an increase or decrease in the number of methadone and buprenorphine programs or individuals seeking treatment for opioid dependence. The findings presented in this paper simply indicate that some of the factors examined were associated.

This study utilized data from TEDS-A, which, for the most part, only includes individuals enrolled in publicly funded substance use treatment programs. The majority of privately owned treatment facilities, which according to SAMHSA accounts for approximately twenty-nine percent of outpatient methadone programs, are not included in the TEDS-A data.[201] Additionally, individuals treated through private physicians that are not contained within a substance use treatment facility, which is the case for the majority of buprenorphine patients, are not included in TEDS-A.[202] The amount of time that individuals in private treatment programs and those being seen by individual doctors waited to enter a treatment program is unknown; therefore, the exclusion of these individuals may result in a skewed representation of treatment wait times for methadone and/or buprenorphine patients overall.

Finally, there was a significant amount of missing data for the outcome of interest in this study. Multiple imputation and listwise deletion were performed on each single year sample; however, only listwise deletion and bootstrapped listwise deletion could be performed on the combined year samples due to the very large sample size. For the 1998 methadone analyses, the association between Medicaid coverage of methadone and treatment wait time differed, with the bootstrapped LD (Table 2A.10) and LD (Table 2A.11) analyses indicating that Medicaid coverage of methadone was associated with a decrease in treatment wait time. The MI analysis (Table 2A.12), however, indicated that Medicaid coverage was significantly associated with an increase in treatment wait time, which was consistent with the findings of the 1998-2008 bootstrapped LD analysis presented in this paper. The 2008 bootstrapped LD (Table 2A.7), LD (Table 2A.8), and MI analyses (Table 2A.9) all indicated that Medicaid coverage of

methadone was significantly associated with an increase in treatment wait time, which is also consistent with the findings presented in this paper, although the effect size in the 2008 MI methadone analysis is smaller than the effect size in the LD and bootstrapped LD analyses. For the single year buprenorphine analyses, the findings are consistent with the direction of the bootstrapped 2006-2008 LD analysis presented in this paper, in that they also indicate that Medicaid coverage of buprenorphine was associated with an increase in treatment wait time. Both single year buprenorphine MI analyses (Tables 2B.9 and 2B.12), however, produced more conservative effect sizes than the single year LD (Tables 2B.8 and 2B.11), single year bootstrapped LD (Tables 2B.7 and 2B.10) and the combined year bootstrapped LD (Table 2B.5) presented in this paper. While these associations were all significant, the variability in the effect sizes across these analyses warrants a cautious interpretation of the extent of the combined year associations presented in this paper.

Conclusion

Overall, the findings of this study highlight significant delays to substance use treatment entry. Individuals in the methadone sample waited an average of five days to enter treatment, and individuals in the buprenorphine sample waited an average of 6 days to enter treatment. In addition, several variables included in these analyses were associated with an even greater increase in average wait time, including Medicaid coverage of methadone and buprenorphine and younger age. Taken together, these findings indicate a significant gap in the demand versus availability of substance use treatment in the US. Further, given the fact that attrition for treatment entry is most significant within the first twenty-four hours after the initial contact is made with a program, these findings may provide insight into the low rate of treatment engagement among substance users in the US.

Chapter 7: Medicaid Coverage of Methadone and Utilization of Medication Assisted Treatment (Aim 3 Analysis)

Background

Between 2002 and 2012, substance use treatment admissions for opioid dependence increased steadily in the United States, from 18% to 26%, while treatment for alcohol, marijuana, cocaine and methamphetamines have either decreased or remained stable.[1] Several types of treatment are currently available for opioid dependence, but they fall into two main categories of modality: drug-free inpatient/outpatient treatment, which includes inpatient rehabilitation programs such as therapeutic communities, and outpatient support groups such as Narcotics Anonymous which are largely focused on abstinence; and medication-assisted treatment (MAT), which includes methadone, buprenorphine and naltrexone. Of these forms of treatment, MAT have been shown to be the most effective at reducing ongoing opioid use by suppressing withdrawal symptoms and blocking the effects for other opioids, such as heroin.[4,5,35,36] This quality is critical in treating opioid dependence because it can both reduce the likelihood of sustained or increased use of other opioids, as well as decrease the likelihood of overdose.

Despite overwhelming evidence supporting the effectiveness of MAT, these treatments are provided by a minority of substance use treatment programs and used by only 10% of opioid dependent individuals.[3,68,210] Further, a recent longitudinal analysis of substance use treatment data indicates that MAT utilization is declining, even in the face of a sustained increase in opioid use and dependence in the United States. Between 2002 and 2012, the use of MAT decreased from 35% to 28%.[1]

Previous research investigating potential explanations for limited uptake and provision of MAT has found individual level factors, such as cocaine injecting or crack smoking[60,61], homelessness[62], recent or previous incarceration[61,62], injection drug use[60–62], previous negative experiences with MAT[63–65], perceived stigma associated with medication assisted treatments, particularly methadone,[65–69] and the

perceived punitive treatment structure of methadone programs,[70] to be associated with a decreased likelihood of MAT utilization. Factors previously found to be associated with an increased likelihood of MAT use include being female,[61,62,71] married[71], having Medicaid coverage[62], use of heroin[60,62,64], older age[61,62] and having previously been in substance use treatment[60,71]. To date, we are unaware of any research investigating the relationship between structural factors such as Medicaid coverage of methadone, and the use of MAT by opioid dependent individuals, which is the primary objective of this study. In addition to Medicaid coverage of methadone, additional structural factors related to the economic environment and the need for substance use treatment within states were included in this study. The selection of these additional structural variables was guided by a framework developed by Schneider and Jacoby to investigate factors related to state coverage of Medicaid optional services. The structural factors utilized in this study include the percent of residents receiving Medicaid in each state, the rate of opioid dependent individuals enrolled in substance use treatment and the rate of methadone programs in each state.[193]

Methods

This study hypothesized that individuals receiving substance use treatment in states with Medicaid coverage of methadone will be more likely to utilize MAT than individuals receiving substance use treatment in states with no Medicaid coverage of methadone. To test this hypothesis, an individual-level analysis was conducted with Medicaid coverage of methadone as the main predictor of interest. Additional predictor variables included a combination of individual-level demographic characteristics, program-level characteristics and structural variables which served as proxies for the state environment. An explanation of the variables and data sources is described below.

Analytic Sample

Individual-level substance use treatment admission data were obtained from the Treatment Episodes Data Set-Admissions (TEDS-A) for the calendar years of 1998 and 2008. The TEDS-A is a publicly available administrative dataset comprised of new admissions to most publicly funded alcohol and substance use treatment facilities in the United States. TEDS-A data are available to the public by the Substance Abuse and Mental Health Services Administration (SAMHSA) and reflect all encounters in publicly funded substance use treatment programs in a given year.[127] The TEDS-A does not include an identifier to distinguish unique individuals; therefore, if the same person enters a treatment program three times in a given year, TEDS-A counts this as three distinct treatment episodes, rather than one.

Once the TEDS-A data were obtained from SAMHSA, they were matched with state-level variables based on an indicator variable representing the state. For instance, if the methadone treatment rate for NJ was 40.5, every individual receiving treatment in NJ would have 40.5 for the methadone treatment rate variable in the final dataset. This matching was done for each study year and the data were then merged into a final dataset that contained both study years. In the final combined dataset, the unit of analysis was person-year.

The analytic sample is described in Figure 3.1. Only opioid users were retained in the final dataset given that the outcome of this analysis is use of medication assisted treatment, and those treatments are only indicated for opioid users. The final sample was restricted to thirty eight states that had sufficient data for both study years on the main predictor variables of interest and the outcome variable. Individuals enrolled in substance use treatment in the following states were included in the final sample: Alaska, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Wisconsin and

Wyoming.

Independent Variables

Individual and Program-Level Variables

Individual and program-level variables such as sex, age, race, ethnicity, gender, education, marital status, employment, income, housing, drug use, program type and insurance coverage were obtained from TEDS-A.

Structural Variables

Structural variables used in this study included the percent of residents in each state receiving Medicaid, the rate of methadone programs in each state, the rate of opioid dependent individuals enrolled in substance use treatment in each state and state Medicaid coverage of methadone. Each continuous variable (percent of residents in receiving Medicaid, rate of opioid dependent individuals enrolled in treatment and the rate of methadone programs) was standardized by dividing the mean score of that variable by the standard deviation in order to create a common scale. A description of each structural variable follows.

Percent of Residents Receiving Medicaid

Data regarding Medicaid beneficiaries were obtained from the Centers for Medicaid and Medicare (CMS), Medicaid Statistical Information System. The total number of beneficiaries was obtained for each state and then the proportion of residents receiving Medicaid was calculated using population totals obtained from the United States Census. Data were obtained for 1999 (1998 Medicaid beneficiary data were not available) and 2008.

Rate of Opioid Dependent Individuals Enrolled in Substance Use Treatment

The number of opioid dependent individuals receiving substance use treatment was gathered from the TEDS-A data set for the years 1998 and 2008. In order to standardize the number of individuals per state, a treatment rate of individuals per 1 million population was calculated based on the number of opioid dependent individuals in any type of substance use treatment each year and the population of each state.

Rate of Methadone Programs

The number of methadone programs was obtained from the Uniform Facility Data Set (UFDS) for 1998, and the National Survey of Substance Abuse Treatment Services (N-SSATS), formerly known as the UFDS, for 2008. The UFDS and N-SSATS include all private and publicly funded substance use treatment programs in the United States. The UFDS and N-SSATS data used for this study were limited to the total number of programs providing methadone in 1998 or 2008. In order to standardize the number of programs per state, a program rate of programs per 10,000 population was calculated based on the number of methadone programs and the population of each state.

Medicaid Coverage of Methadone

State Medicaid coverage of methadone for 1998 and 2008 was obtained from two sources. For 1998, data were obtained from McCarty et al's study, "Methadone Maintenance and State Medicaid Managed Care Programs".[142] For 2008, Medicaid coverage of methadone by state was obtained from the State Financing for Medication Assisted Treatment study.[9] For both study years, Medicaid coverage of methadone was dichotomized as yes/no.

Dependent variable

Data regarding MAT utilization was gathered from TEDS-A for 1998 and 2008. In the TEDS-A, MAT is a category of treatment that includes two types of treatment: methadone and buprenorphine. The

TEDS-A question regarding MAT does not, however, distinguish between these two treatment types. In 1998, the only medication assisted treatment available in the United States was methadone; however, in 2008, buprenorphine was also available as a MAT option. This study utilizes both study years, but only examines the influence of Medicaid coverage of methadone on MAT use.

Analytic Approach

Bivariate logistic regression was used to examine the unadjusted association between Medicaid coverage of methadone and the utilization of MAT. Multivariable logistic regression was then used to model the relationship between all predictor variables and MAT utilization in a stepwise manner. Models were tested for 1998, 2008 and the combined 1998-2008 years. The final combined year model included an interaction term to test for the combined effects of time and Medicaid coverage of methadone on the utilization of MAT.

All associations were considered statistically significant at the $p<.05$ level. Statistical analyses were performed using SAS 9.3 (SAS Institute, Cary, NC). The City University of New York's Human Research Protections Program Office approved this study.

Missing Data

There was a significant amount of missing data in the 1998 and 2008 samples. Missing data can be missing completely at random (MCAR), missing at random (MAR) and missing not at random (MNAR). To explore the patterns of missing data in this study, comparisons were made between observations

containing missing data and those with no missing data on all study variables for 1998 and 2008 (see Tables 3.1 and 3.2). These comparisons indicated that cases with missing data were significantly different from cases with no missing data on nearly every study variable in 1998 and the majority in 2008, indicating that the data were not likely MCAR. Data in this study were treated as MAR and both Listwise Deletion (LD) and Multiple Imputation (MI) were used to handle these missing data. For LD, cases that contained at least one missing value for any study variable were eliminated from analyses. For MI, all study variables, including the outcome variable, were included in the imputation procedure. A series of five imputations was performed using the Markov Chain Monte Carlo method in SAS 9.3 (SAS Institute, Cary, NC). While LD and MI were performed for each single study year; only LD could be performed in the combined year analyses due to the very large sample size.

Resampling

Even after restricting the final dataset based on study criteria, the remaining sample sizes were quite large, raising concern regarding misleading inferences about relatively small effects.[184] Bootstrapping is a resampling technique used to validate non-normally distributed data and produce unbiased estimates that demonstrate good internal validity, which is crucial in large sample sizes.[143] Bootstrapping was performed on the single year and combined year LD samples to ensure that study findings were consistent across smaller and different samples. Bootstrapping was carried out using an unrestricted random sample of individuals selected from the 1998, 2008 and combined 1998-2008 LD datasets. Each of these samples was replicated in 100 separate datasets and then combined to form a final sample for analysis of the single and combined study years.

The final stepwise models presented in this paper are from the combined year (1998-2008) bootstrapped LD analyses (see Table 3.5). The results of the 2008 bootstrapped LD analyses are contained in Table 3.7 and the 1998 bootstrapped LD analyses are presented in Table 3.10. For the

results of the combined 1998-2008 LD analyses, the reader is referred to Table 3.6. The single year LD results can be found in Tables 3.8 (2008) and 3.11 (1998). The results of the 2008 and 1998 MI analyses can be found in Tables 3.9 and 3.12, respectively.

Results

Figure 3.1 depicts the various analytic sample sizes for each step of the analyses conducted, as well as for the overall sample and sample sub-sets. The demographic characteristics of the final combined 1998-2008 bootstrapped LD sample are described in Table 3.3. The sample was predominately male (60%), white (66%) and non-Hispanic (93%). The majority of the sample was high school educated (67%), one-fifth were employed (20%) and over one-third were unstably housed (41%). The age of the sample was evenly distributed across all categories. The overwhelming majority of the sample (81%) was enrolled in non-rehabilitation treatment programs, such as detoxification or outpatient programs. Less than one-fifth (19%) of the sample was receiving MAT, and just over one-quarter reported having a psychological problem. Heroin was the most commonly used drug (71%), followed by cocaine/crack (35%) and synthetic opioids (33%). Close to half of the sample (43%) reported current IDU at the time of admission. The majority of the sample (53%) was uninsured and had no reported income (43%). The overwhelming majority of the sample (85%) were enrolled in substance use treatment programs in states that provided Medicaid coverage of methadone. As detailed in Table 3.4, individuals receiving treatment in states with Medicaid coverage of methadone were more likely to be male, black, other race, high school educated, unstably housed, older, enrolled in outpatient or detoxifications programs, receiving MAT, reporting heroin and cocaine/crack use, using 1 or 2 substances, an IDU, have Medicaid coverage or private insurance, report public assistance, retirement/pension or other income as their primary source of income and receive substance use

treatment in states with a higher rate of methadone programs and opioid dependent individuals in treatment.

Findings from the unadjusted bivariate and adjusted multivariate logistic regression analyses are displayed in Table 3.5. Given the large number of significant associations, only significant predictors with OR<0.5 or OR≥2.0 will be explored in detail.

Model 1 tested the unadjusted association between the main predictor of interest, Medicaid coverage of methadone, and MAT utilization. This association was significant and indicated that being enrolled in substance use treatment programs in states with Medicaid coverage of methadone was associated with an increased odds of MAT utilization (OR=4.79; 95% CI 4.14-5.54).

In Model 2, Medicaid coverage of methadone was examined along with the addition of demographic characteristics including sex, race, ethnicity, education, marital status, employment, unstable housing and age. Medicaid coverage of methadone remained a significant predictor of MAT use in this model (OR=4.48; 95% CI 3.87-5.54). In addition, age was also significant, with individuals younger than 24 years old less likely to use MAT than individuals that were 45 years of age and older (OR=0.32; 95% CI 0.28-
0.36).

Model 3 examined Medicaid coverage of methadone along with the demographic variables in Model 2 and the addition of predictor variables related to substance use and treatment, including treatment program type, MAT use, psychological problems, the total number and type of substances used at the time of treatment admission and whether the person was injecting drugs at the time of admission.

Medicaid coverage of methadone continued to be associated with an increased odds of MAT utilization (OR=3.03; 95% CI 2.58-3.56). Individuals using heroin (OR=5.64; 95% CI 4.77-6.62), non-prescription methadone (OR=8.94; 95% CI 7.17-11.08), synthetic opioids (OR=3.94; 95% CI 3.39-4.58) and reporting

one drug of abuse at treatment entry, as compared to individuals reporting three drugs (OR=4.18; 95% CI 3.65-4.77) also had an increased odds of using MAT. Attending a rehabilitation program, as compared with non-rehabilitation programs such as detoxification or outpatient (OR=0.17; 95% CI 0.14-0.20), and younger age, particularly individuals less than 24 years age, as compared to 45 and over (OR=0.33; 95% CI 0.29-0.38), were associated with a decrease in the odds of using MAT.

Model 4 included all of the predictor variables contained in the previous models, as well as the addition of health insurance coverage and primary source of income. In this model, Medicaid coverage of methadone (OR=3.16; 95% CI 2.69-3.73), heroin use (OR=5.75; 95% CI 4.88-6.8), non-prescription methadone use (OR=8.25; 95% CI 6.63-10.31), synthetic opioid use (OR=3.90; 95% CI 3.36-4.55) and reporting one (OR=4.44; 95% CI 3.88-5.09) or two (OR=2.03; 95% CI 1.83-2.24) drugs of abuse at treatment entry, as compared to reporting three drugs, were all associated with an increased likelihood of MAT use. Attending a rehabilitation program, as compared to detoxification or outpatient programs (p=0.16; 95% CI 0.14-0.19), and younger age, particularly being less than 24, as compared to individuals 45 and over (OR=0.33; 95% CI 0.29-0.38), continued to be associated with a decreased likelihood of MAT use in Model 4.

Model 5 contained all variables utilized in the previous four models as well as the addition of structural variables related to the state environment, including the rate of methadone treatment programs, rate of opioid dependent individuals in treatment and the percent of residents receiving Medicaid. The addition of these structural variables strengthened the association between Medicaid coverage of methadone and MAT use (OR=6.11; 95% CI 5.03-7.4). In addition, use of heroin (OR=6.44; 95% CI 5.41,7.66), non-prescription methadone (OR=7.17; 95% CI 5.70,8.98), synthetic opioids (OR=3.90; 95% CI 3.32-4.57) and benzodiazepines (OR=2.03; 95% CI 1.69-2.44), as well as reporting one drug of abuse at treatment entry (OR=4.35; 95% CI 3.77-4.96), as compared to three drugs, were all associated with increased odds of MAT use. Similar to Model 4, attending a rehabilitation program, as compared to

detoxification or outpatient programs (OR=0.16; 95% CI 0.14-0.19), and younger age, specifically being less than 24 years age, as compared to individuals 45 and over (OR=0.37; 95% CI 0.32-0.42), continued to be associated with decreased odds of MAT use.

Model 6 included the variables used as predictors in Model 5, as well as the addition of the variable time to account for any differences in the two time periods. In this model, Medicaid coverage of methadone continued to be associated with an increased likelihood of MAT use (OR=6.42; 95% CI 5.267.78), as did heroin use (OR=6.42; 95% CI 5.37-7.61), non-prescription methadone use (OR=7.17; 95% CI

5.74-9.05), synthetic opioid use (OR=3.94; 95% CI 3.36-4.63), benzodiazepine use (OR=2.01; 95% CI 1.682.43) and reporting one drug of abuse at treatment entry (OR=4.35; 95% CI 3.81-5.01), as compared reporting three drugs. Enrollment in a rehabilitation program, as compared to detoxification or outpatient programs (p=0.16; 95% CI 0.14-0.19), and being less than 24 years age, as compared to 45 and over (OR=0.37; 95% CI 0.32-0.42), continued to be associated with a decreased likelihood of MAT use.

Model 7 included all of the predictor variables from Models 1-6 as well as the addition of an interaction term for Medicaid coverage and time. The interaction term was not significant in this model; however, Medicaid coverage (OR=5.37; 95% CI 3.72-7.76), use of heroin (OR=6.36; 95% CI 5.39-7.63), non-prescription methadone (OR=7.24; 95% CI 5.69-8.98), synthetic opioids (OR=3.97; 95% CI 3.34-4.6) and benzodiazepines (OR=2.03; 95% CI 1.67-2.42), as well as reporting one drug of abuse at treatment entry (OR=4.39; 95% CI 3.79-4.99), as compared to three drugs, all continued to be associated with an increased odds of MAT use. Finally, utilizing a rehabilitation program, as compared to detoxification or outpatient programs (p=0.16; 95% CI 0.14-0.19), and being less than 24 years age, as compared to 45 and over (OR=0.37; 95% CI 0.32-0.42), continued to be associated with a decreased odds of MAT use.

Discussion

This study tested the hypothesis that receiving substance use treatment in a state with Medicaid coverage of methadone would increase the likelihood of MAT use among opioid dependent individuals. The findings from this study support this hypothesis. Across all seven models, Medicaid coverage of methadone was significantly associated with higher odds of using MAT for treatment.

In addition to Medicaid coverage of MAT, several variables remained significantly associated with higher odds of MAT utilization across models, but did not have an OR$\geq$2.0. These variables included being Hispanic, married, employed, cocaine use, benzodiazepine use, reporting two substances of abuse at admission, as compared to three, having no health insurance, receiving substance use treatment in states with an increased number of methadone programs and receiving treatment in a state with an increased percentage of Medicaid beneficiaries. Significant variables that were associated with reduced odds of MAT use across all study models, but did not have an OR<0.5, included being male, identifying as other race, as compared to white, being between 25-34 years old and 35-44 years old, as compared to being over 44 years old, reporting psychological problems, having a retirement/pension or no income as the primary source of income, receiving substance use treatment in a state with fewer opioid dependent individuals and receiving substance use treatment in 1998 as compared to 2008. The significant factors associated with increased odds of MAT use in the final model of this study that are consistent with the literature include older age[61,62], being married[71], using heroin[60,64], crack/cocaine use[61], and having Medicaid coverage[62]. Factors in this study that were associated with reduced odds of MAT use that are consistent with the literature include being male[61,62,71] and black[62]. Contrary to previous findings, this study found increased odds of MAT utilization among IDUs[62] and no association between unstable housing and MAT use[62,64].

The positive association between age and increased odds of MAT use that was found in this study, and has been observed in other studies, is particularly noteworthy given the current opioid

epidemic. While the average age of individuals attending substance use treatment in the United States is 35 years old, recent trend data from TEDS-A indicate that between 2002 and 2012, the largest increase in treatment admissions due to heroin use was among 20-34 year old non-Hispanic whites.[1] Given the steady increase in the number of young opioid users over the last decade, and the importance of providing the most effective treatments to opioid dependent individuals as early on in their drug using careers as possible, it is critical that medication assisted treatments are available and accessible to young opioid users. Given this finding, and the precipitous increase in the use of opioids by young people in the United States, future research investigating the reasons for low MAT utilization among this population is critical.

Limitations

This study is subject to several limitations. The primary purpose of this study was to test the association between state Medicaid coverage of methadone and the use of methadone treatment by opioid dependent individuals. However, the TEDS-A does not distinguish between methadone and buprenorphine use; rather, these treatments are lumped together in one question about MAT use. In 1998, methadone was the only approved MAT available for the treatment of opioid dependence in the United States; however, in 2008 buprenorphine was also available. An affirmative response to MAT use in the 2008 TEDS-A could indicate either methadone or buprenorphine treatment. In the 1998 analysis (Table 2A.10), Medicaid coverage of methadone was associated with an increased likelihood of MAT utilization (OR=2.33; 95% CI 2.06-2.62). In the 2008 analysis (Table 2A.8), this association was also significant, but stronger (OR=8.16; 95% CI 6.51-10.22). The strengthening of this association could be the result of several factors; however, it is possible that the increased association between study years is due to the inclusion of buprenorphine in the MAT question. Given this, this study may be subject to response bias due to the double-barreled question regarding MAT use in the 2008 TEDS-A.

Another limitation of the TEDS-A data is that they do not represent the universe of treatment admissions in the United States. Rather, the majority of TEDS-A data come from publicly funded substance use treatment programs. Most privately owned treatment facilities, which account for approximately twenty-nine percent of outpatient methadone programs in the United States, are not included in TEDS-A.[201] The exclusion of privately funded substance use treatment programs may reduce the external validity of the findings in this study.

Finally, missing data was a significant issue in this study. In order to address this limitation, MI and LD were performed on each single year sample. Additionally, bootstrapping was conducted on the LD samples to validate these findings. Due to the large sample size in the combined year analyses, MI could not be performed. In comparing the results across the three 1998 analyses, the associations between Medicaid coverage of methadone and MAT utilization were consistent, with the bootstrapped LD (Table 3.10), LD (Table 3.11) and MI analyses (Table 3.12) indicating that individuals receiving treatment in states with Medicaid coverage of methadone had approximately twice the odds of using MAT, as compared with individuals in states with no Medicaid coverage of methadone. The findings across the 2008 analyses were also consistent regarding the significant association between Medicaid coverage of methadone and MAT utilization; however, in the 2008 MI analysis (Table 3.9), the odds ratio was 2.59 (95% CI 2.54-2.65), compared to 8.00 (95% CI 7.08-8.99) in the LD analysis (Table 3.8) and 8.16 (95% CI 6.51-10.22) in the bootstrapped LD analysis (Table 3.7). In light of the variability in effect sizes across the 2008 analyses, combined year analyses presented in this paper should be interpreted with caution.

Despite the limitations of the TEDS-A, it is the only national data set containing substance use treatment admissions. These data are widely used by researchers and federal agencies to gain a better understanding of the characteristics of individuals enrolled in substance use treatment in the United States. The findings presented here, while subject to limitations, utilized TEDS-A data to provide a novel investigation of the association between structural factors and MAT utilization.

Conclusion

Despite strong evidence supporting the effectiveness of MAT for treating opioid dependence, MAT utilization has decreased over the last decade. During the same time period, opioid use and dependence have increased significantly, particularly among non-Hispanic whites between the ages of 20-34. In this study, MAT use was negatively associated with age, such that individuals younger than 44 years old were less likely to utilize MAT as compared with individuals 45 and older. Understanding the factors associated with decreased utilization of MAT may help increase the availability and accessibility of these treatments, which may help to reduce the public health consequences of opioid dependence.

Chapter 8: Discussion and Conclusion

The purpose of this dissertation was twofold: (1) to provide a state-level examination of the influence of factors related to the need for substance use treatment, and the extent to which the economic environment of states are correlated with Medicaid coverage of methadone and buprenorphine; and, (2) to investigate the impact that Medicaid coverage of these treatments has on individuals seeking substance use treatment in the United States, in terms of the amount of time a person waits to enter substance use treatment and the extent to which opioid dependent individuals utilize MAT.

This chapter provides an overview of the study findings presented in Chapter 5, 6 and 7, policy recommendations related to these findings, limitations to this dissertation and a discussion of future research directions based on this work.

Discussion of Results

Is the economic situation of a state correlated with Medicaid coverage of methadone or buprenorphine? The findings of these analyses were mixed. Two measures, FMAP and per capita income, were significant across all study years for both methadone and buprenorphine, indicating that states with greater wealth were more likely to cover methadone or buprenorphine for Medicaid beneficiaries. The correlation between substance use treatment block grant funding, annual state expenditures and Medicaid coverage of methadone or buprenorphine were not consistent, varying in the year-to-year analyses, as well as across measures. The final measure of state wealth, the percent of residents receiving Medicaid, was not correlated with Medicaid coverage of methadone or buprenorphine in any study year. The lack of consistent findings across the remaining three economic variables and respective treatment types may provide evidence for a weak relationship between these

variables, or they may indicate that they are poor proxy variables for state wealth. The percent of residents receiving Medicaid and amount of substance abuse block grant funding states receive only capture the wealth, or lack thereof, of a portion of a state's population; whereas, per capita income and FMAP rate serve as more general indicators of population wealth. Further research using these and other novel proxy measures for state wealth can provide additional evidence as to the extent of the relationship between state wealth and Medicaid coverage of methadone or buprenorphine.

Is the need for opioid treatment correlated with Medicaid coverage of methadone and buprenorphine? The results regarding need for treatment, particularly for methadone, were also inconsistent. For methadone, the rate of opioid dependent individuals was correlated with an increased likelihood of Medicaid coverage in 1998 and the combined year analysis; however, the confidence intervals in these analyses were quite large and as such indicate a weak relationship. Similarly, while there was a consistent correlation between the rate of methadone programs and Medicaid coverage of methadone across all study years, the confidence intervals associated with each of these analyses were also very large. Finally, there was no relationship between either need factor and Medicaid coverage of buprenorphine.

Is Medicaid coverage of methadone or buprenorphine associated with shorter wait times for substance use treatment entry? For both methadone and buprenorphine, Medicaid coverage was associated with a significantly longer wait time. Individuals enrolled in substance use treatment in states with Medicaid coverage of methadone waited 219% longer than individuals in states without Medicaid coverage. For buprenorphine, the wait time was 344% longer for individuals enrolled in substance use treatment programs in states with Medicaid coverage, as compared to individuals in states without Medicaid coverage. While these findings do not confirm the study hypothesis, additional research is warranted and should include the proportion of all individuals in substance use treatment in each state, rather than a subset of in-treatment individuals.

Other factors associated with increased wait times for the methadone analysis include being male, other race, as compared to white, employed, unstably housed, less than 18 years old or between 25-44 years old, as compared to individuals over 44, reporting one substance of abuse, as compared to three, having Medicaid, Medicare or no insurance, as compared to private insurance, having retirement/pension or other income as the primary income source, as compared with a salary and receiving treatment in 2008, as compared to 1998. Factors that were associated with a decrease in the mean number of days individuals waited to enter treatment in the methadone analysis included being Hispanic, attending outpatient or detoxification programs, as compared to rehabilitation, utilizing MAT, reporting no substances of abuse at the time of treatment, as compared to three and having no income, as compared to having a salary as the primary source of income.

Variables that were associated with increased treatment wait time in the buprenorphine analysis, include younger age, reported psychological problems, heroin use, synthetic opioid use and Medicare and no health insurance (as compared with private insurance). Factors that were associated with a decrease in the mean number of days individuals waited to enter treatment included being male, black (as compared to white), Hispanic, being employed, use of MAT, detoxification and outpatient program enrollment, as compared to enrollment in a rehabilitation program, opioid use, reporting one substance of abuse, as compared to three and reporting public assistance, retirement/pension, other income source or no income, as compared to salary as the primary source of income.

Is Medicaid coverage of methadone associated with an increase in the utilization of MAT? The results of this analysis indicate that Medicaid coverage of methadone is associated with increased odds of MAT utilization. Other factors that were associated with increased odds of MAT utilization include being Hispanic, married, employed, using heroin, non-prescription methadone, cocaine, synthetic opioids, benzodiazepines, reporting one or two drugs of abuse, as compared with three, and having

Medicaid or no insurance, as compared with private insurance. Factors associated with decreased odds of MAT use include being male, black or other race, as compared to white, less than 44 years of age, attending a rehabilitation program versus a non-rehabilitation program (detoxification and outpatient), reporting psychological problems, having retirement/pension or no income as the primary source of income, as compared to salary and receiving treatment in 2008, as compared to 1998.

Policy Recommendations

Based on the main findings of this dissertation, the following policy recommendations are proposed:

Finding: State wealth is correlated with Medicaid coverage of MAT

The results from Aim 1 (Chapter 5) indicate a significant relationship between increased state wealth and Medicaid coverage of MAT. This finding was consistent across both the methadone and buprenorphine analyses and all study years. In addition to these findings, recent data regarding prescribing patterns for opioids demonstrate that states with the highest levels of opioid prescribing, which serves as a proxy for prescription opioid use, also have some of the lowest per capita incomes and highest FMAP rates in the country.[211] Further, two of the five states with the highest rates of opioid prescribing did not cover either methadone or buprenorphine and three of the five states only provided Medicaid coverage of methadone *or* buprenorphine, but did not cover both.[9]

Recommendation:

1. **Increase reimbursement incentives for Medicaid coverage of MAT in states with less overall wealth in order to increase access to evidence based treatments for opioid dependence.**

Finding: Substance use treatment entry wait time averaged between 5-6 days

One of the most important findings from the Aim 2 analysis (Chapter 6) was the fact that individuals waited, on average, 5-6 days to enter substance use treatment. Prior research has found that the first 24 hours following a person's initial contact with a treatment program is the most critical in order to engage and maintain an individual in substance use treatment.[92] Given the increase in opioid use and dependence, novel approaches are needed to increase treatment capacity and continuity in order to reduce the amount of time that individuals wait to enter substance use treatment. The following two regulatory issues serve as impediments to expeditious entry into MAT programs.

MAT pre-authorization: The majority of state Medicaid programs require that pre-authorization of buprenorphine treatment must be obtained prior to a person initiating treatment as well as when they renew their prescription. Physicians and treatment programs have argued that this policy is unnecessarily onerous and contributes significantly to both delays to treatment entry, as well as interruptions in the continuity of MAT.[212,213] These pre-authorization requirements may prevent individuals from initiating treatment altogether, and may also expose individuals that are already maintained on buprenorphine treatment to interruptions in their treatment regimen, which in turn could increase their risk of relapse.

Recommendation:

1. **Streamline or remove pre-authorization requirements for preferred providers or Medicaid beneficiaries with existing prescriptions in order to reduce delays to initiating or continuing buprenorphine treatment.**

Lack of integration of opioid treatment into the primary medical care system: Prior to the passage of the DATA 2000 and approval of buprenorphine in 2002, MAT in the United States was limited only to

methadone, which was administered at opioid treatment programs (OTPs) that were typically segregated from other types of medical care. Many experts believe that this segregation increased the stigmatization of opioid users and created additional barriers to treatment accessibility.[51–53,214] While DATA 2000 and the approval of buprenorphine have helped to integrate substance use treatment into more mainstream medical settings, the restrictions on the administration of methadone remain in place. Additionally, the waiver requirements that doctors must complete in order to become buprenorphine prescribers have been identified as a barrier to becoming a buprenorphine provider.[79–81,84–86] Both the restrictions on methadone provision and requirements for buprenorphine provision likely contribute to the lack of available programs and providers, as well as the low utilization of MAT, which in turn contributes to longer waiting times across substance use treatment services.

Recommendations:

1. **Allow for the administration of all forms of MAT in primary care settings.**
2. **Provide incentives and/or subsidies to physicians in areas with limited MAT availability to prescribe buprenorphine.**

Finding: Younger age is associated with both an increase in treatment wait time and decreased odds of MAT use

The Aim 2 analysis (Chapter 6) indicated that individuals under the age of 18 experienced a 92% increase in treatment wait time, as compared to individuals over 44 years of age. In the Aim 3 analysis, as age decreased, so did the odds that an opioid dependent individual would use MAT. These findings, coupled with the fact that TEDS-A data from 2002-2012 show the largest increase in treatment admissions due to heroin use among 20-34 year olds[1], suggest that increased efforts are required in order to reach and engage younger opioid users in substance use treatment. Such efforts could include an increased use of outreach services that specifically target younger opioid users, with an emphasis on

educating young opioid users about their options for substance use treatment services, including accurate information regarding the effectiveness of each modality. Additionally, substance use treatment

Recommendations:

1. **Amend state and federal budget policies so that substance use treatment programs can be reimbursed for outreach services that target hard-to-reach groups who are disproportionately impacted by substance use.**
2. **Provide incentives for substance use treatment programs to expand their programming capacity to provide specialized services to younger substance users.**

Finding: Enrollment in a substance use treatment program in a state with Medicaid coverage of methadone is associated with an increased odds of MAT use

Findings from the Aim 3 analysis (Chapter 7) demonstrated that for an individual enrolled in a substance use treatment program in a state with Medicaid coverage of methadone, the odds of them enrolling in MAT was 5 times greater than for an individual receiving treatment in a state without Medicaid coverage of methadone (OR=5.37). This finding suggests that the coverage options offered by insurance companies influence the types of treatments that opioid users utilize.

As of 2013, buprenorphine was covered in all 50 states for Medicaid beneficiaries; however, methadone was only covered in 30 states. Such policies that limit coverage options employ a "one size fits all" model, despite the fact that the appropriateness and satisfaction of each treatment varies across individuals. Limitations to the types of substance use treatment may lead to an increased likelihood of relapse if the treatments that are covered by Medicaid do not work for particular individuals.

Recommendation:

1. **Require that at least two MAT options are available to Medicaid beneficiaries.**

Limitations

This dissertation project served as an initial exploration of state-level influences on Medicaid coverage of methadone and buprenorphine treatment, and the impact of this coverage on the utilization of substance use treatment. While novel, this study is subject to several limitations.

The design of this study was constructed based on the availability of the primary variable of interest, Medicaid coverage of methadone and buprenorphine. Longitudinal Medicaid coverage data across multiple years were not publicly available. Because of this, the analyses for all three aims of this dissertation were limited to the two time periods that state Medicaid coverage data were publicly available for each treatment type (1998 and 2008 for methadone, and 2006 and 2008 for buprenorphine).[9,54,142] This limitation reduced my ability to detect causality and the immediate and direct effects of changes in Medicaid coverage of each treatment, given that I was unable to determine the exact timing of any changes in Medicaid coverage.

The Treatment Episodes Data Set-Admissions served as my primary data source for this study, and there are noteworthy limitations to the TEDS-A. First, the TEDS-A is consists of data reported primarily by publicly funded substance use treatment facilities to the SAMHSA, as per state requirement.[122] Most privately owned treatment facilities, of which approximately 29% of outpatient methadone programs are in the United States, are not required to report their treatment data as per state regulations, and are therefore not likely to be included in the TEDS-A.[201] This limitation may have introduced selection bias into both the methadone and buprenorphine analyses given that only a portion of private programs are required to report their admission data.[122] Further, the TEDS-A does not contain treatment episodes from private practice physicians or those physicians operating outside of licensed substance use

treatment programs. In 2012, only 19% of buprenorphine clients received their treatment from an opioid treatment program (OTP); therefore, the overwhelming majority of buprenorphine clients are not included in the TEDS-A.[215] Given this, it is conceivable that the individuals contained within the TEDS-A that received buprenorphine treatment are different from the overall population of buprenorphine patients in the US. This may limits the generalizability of the analyses presented in Chapter 6 and 7.

When data collection began for the TEDS-A, methadone was the primary MAT provided in the United States. When buprenorphine was introduced in 2002, the TEDS included buprenorphine within an existing question regarding MAT, rather than differentiating between methadone and buprenorphine. Including a double-barreled question is likely to result in response bias, particularly for analyses such as these that seek to differentiate between the two treatment types.[216] The TEDS-A response structure for MAT limited my ability to explore the utilization of each treatment separately in the Chapter 7 analyses. Because of this, the findings regarding methadone utilization in 2008 and the combined 1998-2008 analyses may be overestimated given that the outcome variable, MAT use, likely included some individuals utilizing buprenorphine treatment.

The TEDS-A contains a combination of patient self-reported responses as well as program-reported responses. (Justin Gaertner, SAMHDA User Support, personal communication, April 7, 2015). Variables that are self-reported may be subject to social desirability bias, given the sensitive nature of many of the items, including self-reported psychological problems. Additionally, some variables in the TEDS-A may also be subject to recall bias given that some questions refer to past behavior. Variables that may be impacted by recall bias include self-report of substance use at admission and number of prior treatment episodes.

A final limitation of the TEDS-A is that a significant amount of data were missing, particularly for the treatment wait time and health insurance coverage variables. These missing data may introduce bias, particularly when performing analyses using listwise deletion. Both listwise deletion and multiple

imputation were employed prior to analyses to handle missing data in the analyses presented in Chapter 6 and 7; however, the sample was first limited to individuals receiving substance use treatment in states with ~50% missing data on any one variable included in the analyses. Sub-setting the sample to individuals in a select number of states may have introduced a threat to external validity given that individuals residing in states that were excluded based on significant missing data may be different from the individuals residing in states with ~50% or less missing data for any one variable.

Despite the limitations associated with the TEDS-A, it serves as the most comprehensive source of individual-level data regarding substance use treatment admissions in the United States. Additionally, the TEDS-A is the only dataset that provides individual-level data on treatment wait times across the United States.

A final limitation associated with the datasets utilized in this study comes from the UFDS and NSSATS. Similar to the TEDS-A, there is a known bias associated with the substance use treatment programs included in the UFDS and N-SSATS datasets. The UFDS and N-SSATS datasets were used to calculate the rate of methadone and buprenorphine programs per state. The response rate for these surveys was significant (88% in 1998; 97% in 2006; and, 94% in 2008); however, similar to the TEDS-A, the UFDS and N-SSATS do not include private physicians that are not contained within or affiliated with a substance use treatment program. Given this, the association between the rate of buprenorphine programs and Medicaid coverage is likely to be underestimated.

While this dissertation is subject to several limitations, it provides an important contribution to the literature regarding the impact of Medicaid coverage on opioid dependent individuals. While prior research has documented the ways in which Medicaid coverage restrictions of methadone and buprenorphine impact substance use treatment facilities, to date we are not aware of any study investigating the impact of Medicaid coverage of these treatments on substance users engaged in treatment.

Future Directions

Previous research has investigated individual and program-level factors that are associated with wait time to enter substance use treatment and MAT utilization. This dissertation adds to that literature by both confirming and refuting some of the previous findings. This dissertation also provides a novel contribution to the literature through the investigation of Medicaid coverage of methadone and buprenorphine, the wait time associated with substance use treatment entry and MAT utilization. While the analyses conducted for this dissertation are historical, they reflect a time when opioid use and substance use treatment admissions were increasing, but MAT utilization was decreasing. This is particularly important given the public health significance of opioid use in the United States and the relatively low utilization of the most evidence-based approaches to treating opioid dependence.

The analyses in this dissertation were preliminary and were subject to several limitations. The lack of publicly available secondary data regarding Medicaid coverage of methadone and buprenorphine treatment was a significant limiting factor in the design of this study. Future research might include primary data collection with State Medicaid administrators regarding Medicaid coverage patterns over repeated years in order to conduct a more rigorous analysis of the impact of Medicaid coverage of methadone and buprenorphine on individuals seeking substance use treatment.

This dissertation did not include any analyses since the passage of the PPACA, most specifically since 2014 when substance use treatment became an Essential Health Benefit. Future analyses should explore the availability of methadone and buprenorphine post-PPACA implementation for Medicaid beneficiaries as well as privately insured individuals. There is significant hope that the passage of the PPACA will improve access to and utilization of substance use treatment; however, the variability in the availability of treatment modalities will undoubtedly persist. Future research should investigate changes

to the availability of methadone and buprenorphine treatments, potentially comparing the utilization of these evidence based treatments before and after PPACA implementation.

Finally, while this dissertation investigated Medicaid coverage of methadone and buprenorphine as a dichotomous variable, future research might include a more nuanced definition of this variable. In some states Medicaid programs cover methadone and/or buprenorphine treatments, but the use of them is limited by pre-authorization requirements for treatment initiation or restrictions to the length of time that individuals can use them.[213] These restrictions could have a significant impact on treatment engagement, utilization of MAT and treatment outcomes. Future studies might define Medicaid coverage as a polytomous variable, including categories such as full coverage, no coverage, restricted coverage, or even more specifically, restricted coverage based on lifetime limits and restricted coverage based on pre-authorization. Creating a more specific definition of the ways in which Medicaid coverage is restricted might result in an increased ability to detect the specific impact of these restrictions.

Conclusion

This dissertation provided an historical analysis of the availability of the two most effective treatments for opioid dependence during a time when both nonmedical use of prescription opioids and heroin use increased significantly in the United States. The impetus for this study was to better understand why some states provided coverage of methadone and buprenorphine for Medicaid beneficiaries while others did not, and how Medicaid coverage of these treatment impacted opioid dependent individuals' access to treatment. While this study had limitations, particularly based on the availability of complete and multi-year data, it addressed a significant gap in the literature by examining factors related to Medicaid coverage at the state-level and the impact of this coverage on individuals enrolled in substance use treatment.

Since 2008, significant progress has been made with respect to substance use treatment and

Medicaid coverage. In 2008, the Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act of 2008 (MHPAEA) was passed, paving the way for elimination of differential benefits for substance use treatment as compared to those placed on medical/surgical benefits. Additionally, in 2010, the PPACA was passed, paving the way for the expansion of Medicaid coverage to an increased number of individuals in thirty one states and the prioritization of substance use treatment as an essential health benefit. These policy changes have been considered unprecedented by substance use treatment experts[217] because of their potential to significantly increase access to substance treatment services. However, while these policies provide incredible opportunities for reducing barriers to treatment, it is critical that we remain cautiously optimistic because an expansion of coverage does not necessarily equal an increase in accessibility or utilization. In Massachusetts, for example, where universal health insurance was provided to nearly all state residents prior to the passage of the PPACA, admissions to substance use treatment programs, which had been expected to increase significantly, remained flat.[218] Since the early 2000s, substance use treatment admissions for opioids have increased steadily, yet since the passage of PPACA, the total number of substance use treatment facilities has decreased, from 17,204 in 2010 to 14,630 in 2013, as has the utilization of MAT.[219,220] In order to keep pace with an expansion in the population of individuals with health insurance that are in need of substance use treatment, there must be a concurrent expansion in services in order to ensure that substance use treatment is accessible. Future research should monitor the impact of the expansion in Medicaid coverage, the prioritization of substance use treatment as an EHB and the extent to which the passage of the Parity Act are impacting substance use treatment access.

Appendices

Figure 1.1: Factors Influencing State Adoption of Medicaid Optional Services, Schneider & Jacoby

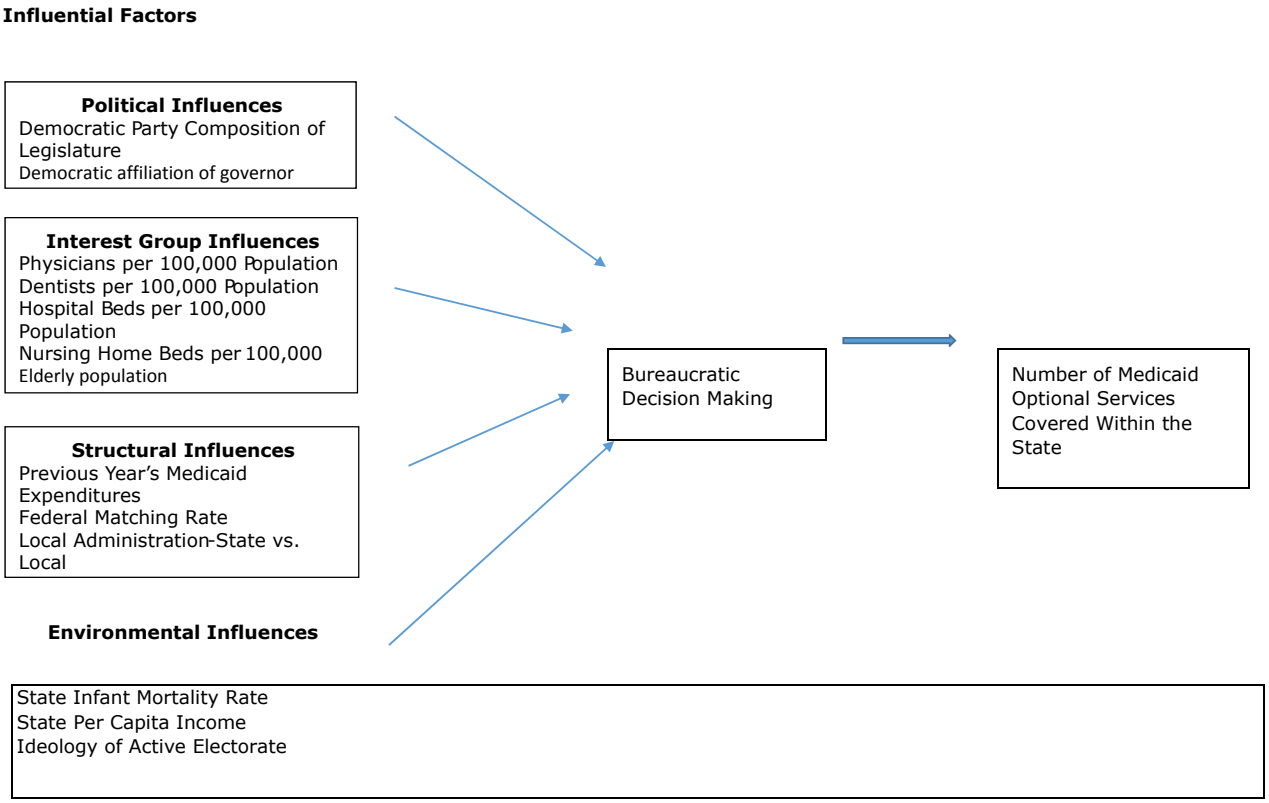


Figure 1.2: Factors Influencing State Medicaid Coverage of Methadone and Buprenorphine, Utilizing an Adapted Version of the Schneider & Jacoby Framework

Influential Factors

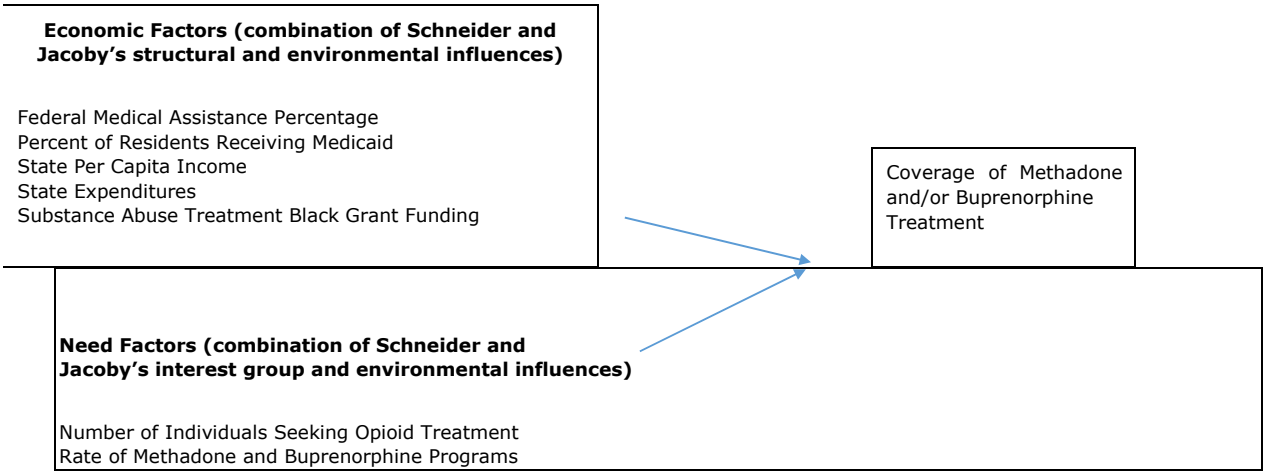


Figure 1.3: Analytic Sample for Aim 1, State-Level Analysis of Economic and Need Factors and Medicaid Coverage of Methadone and Buprenorphine



Table 1.1: Medicaid Coverage of Methadone (1998, 2008) and Buprenorphine (2006, 2008)

	Medicaid Coverage of Methadone		Change in Methadone Coverage	Medicaid Coverage of Buprenorphine		Change in Buprenorphine Coverage	
State	1998	2008	Began Covering	2006	2008	Began Covering	Stopped Covering
AL	1	1		0	0		
AK	0	1	x	1	1		
AZ	1	1		1	1		
AR	0	0		0	0		
CA	1	1		1	1		
CO	0	1	x	0	1	x	
CT	1	1		0	1	x	
DE	1	1		1	1		
DC	1	—		0	—		
FL	1	1		1	1		
GA	1	1		0	1	x	
HI	1	1		1	1		
ID	0	0		0	0		
IL	0	1	x	1	1		
IN	0	0		0	1	x	
IA	0	1	x	0	1	x	
KS	0	0		0	1	x	
KY	0	0		0	0		
LA	0	0		0	0		
ME	1	1		0	1	x	
MD	1	1		1	1		
MA	1	1		1	1		
MI	1	1		1	1		

MN	1	1		1	0		x
MS	0	—		0	—		
MO	0	1	x	0	1	x	
MT	0	0		0	1	x	
NE	0	1	x	1	1		
NV	1	1		0	1	x	
NH	0	1	x	0	1	x	
NJ	1	1		1	1		
NM	0	0		1	1		
NY	1	1		1	1		
NC	1	—		1	—		
ND	0	—		1	1		
OH	1	1		1	1		
OK	0	1	x	0	1	x	
OR	1	1		0	1	x	
PA	1	1		1	1		
RI	1	—		1	—		
SC	0	0		0	—		
SD	0	1	x	1	1		
TN	0	1	x	1	1		
TX	0	—		0	1	x	
UT	1	1		0	0		
VT	0	1	x	1	1		
VA	0	1	x	1	1		
WA	1	1		1	1		

WV	0	0		1	0		x
WI	1	1		1	1		
WY	0	0		1	1		
Total	**25**	**34**	**12**	**28**	**38**	**14**	**2**

Table 1.2: Results of Bivariate Logistic Regression Analyses for Medicaid Coverage and Economic and Need Factors

	Medicaid Coverage of Methadone									Medicaid Coverage of Buprenorphine								
	1998, n=48			2008, n=44			1998-2008 Combined, n=92			2006, n=48			2008, n=45			2006-2008 Combined, n=93		
	OR	(95% CI)	p	OR	(95% CI)	p	OR	(95% CI)	p	OR	(95% CI)	p	OR	(95% CI)	p	OR	(95% CI)	p
Economic Factors																		
FMAP	0.36	(0.18-0.72)	0.004	0.17	(0.06-0.51)	0.002	0.3	(0.17-0.51)	<0.0001	0.38	(0.18-0.75)	0.006	0.12	(0.03-0.50)	0.004	0.30	(0.17-0.52)	<0.0001
% of Res Rec'v Medicaid	1.09	(0.61-1.93)	0.777	0.82	(0.42-1.59)	0.553	1.25	(0.81-1.94	0.309	1.24	(0.69-2.24)	0.471	0.79	(0.37-1.69)	0.536	1.10	(0.70-1.72)	0.678
Per Capita Income	2.00	(1.42-7.57)	0.005	5.16	(1.45-18.30)	0.011	3.45	(1.87-6.35)	<0.0001	2.11	(1.03-4.31)	0.04	13.12	(1.92-89.79)	0.009	3.97	(1.92-8.21)	0.0002
SABG	////////////////////////////////			11.73	(0.99-137.66)	0.05	////////////////////////////////			1.92	(0.74-4.96	0.177	5.42	(0.52-56.41)	0.157	2.24	(0.94-5.36)	0.071
State expenditures	4.74	(1.34-16.71)	0.016	6.03	(0.88-41.57)	0.068	7.9	(2.39-26.14)	0.001	2.79	(0.91-8.53)	0.073	1.75	(0.46-6.59)	0.411	2.38	(1.01-5.61)	0.048
Need factors																		
Rate indiv in opioid tx/10,000 pop	114.2	(2.32->999.99)	0.017	2.57	(0.73-9.00)	0.14	9.68	(2.52-37.18)	0.001	1.44	(0.76-2.70)	0.215	1.42	(0.55-3.69)	0.472	1.55	(0.90-2.67)	0.118
Rate of meth progs/1M pop	6.11	(1.58-23.58)	0.009	5.89	(1.22-28.38)	0.027	6.5	(2.42-17.44)	0.0002	////////////////////////////////			////////////////////////////////			////////////////////////////////		
Rate of bupe progs/1M pop	////////////////////////////////			////////////////////////////////			////////////////////////////////			1.52	(0.78-2.95)	0.264	1.57	(0.53-4.70)	0.417	1.69	(0.92-3.11)	0.094

Figure 2A.1: Analytic Sample, Treatment Wait Time and Medicaid Coverage of Methadone

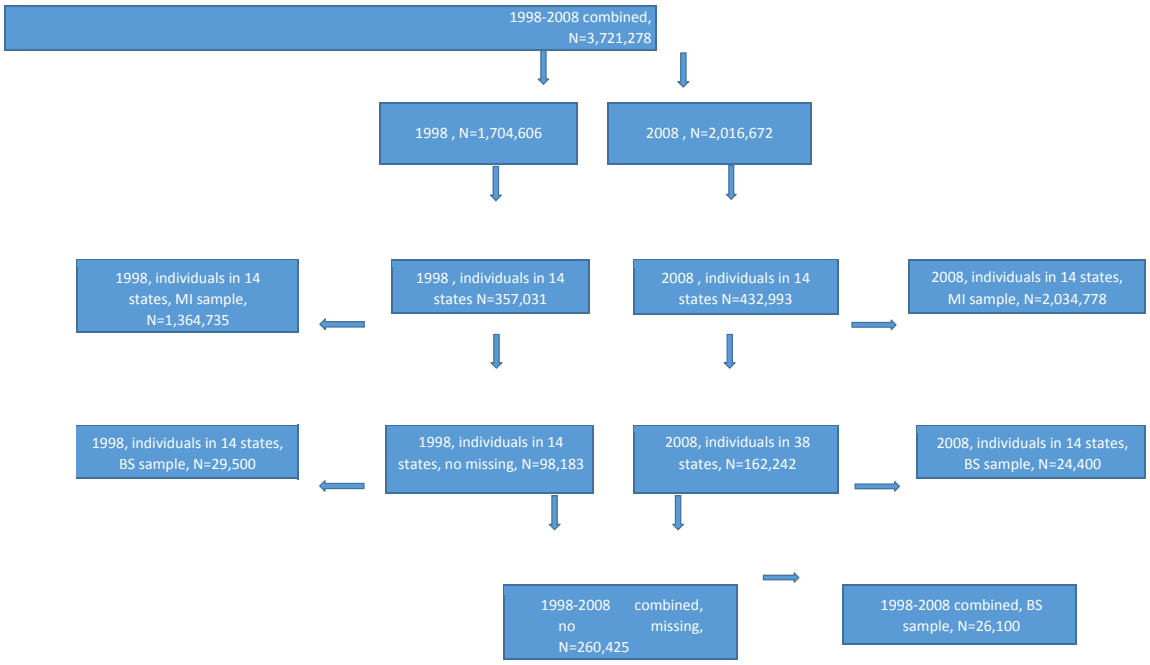


Table 2A.1 Comparison of Characteristics of Cases with Missing Data on Any Variables Compared to Cases with No Missing Data, Treatment Wait Time and Medicaid Coverage of Methadone Analysis, 2008

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
	N=270,751	N=162,242
	n (%)	n (%)
Medicaid Coverage of Methadone***	260197 (96%)	72749 (45%)
missing	n=0	n=0
Male***	175226 (65%)	113360 (70%)
missing	n=71	n=0
Race		
White***	182659 (77%)	122257 (75%)
Black***	42224 (18%)	26327 (16%)
Other Race***	13853 (6%)	13658 (8%)
missing	n=32015	n=0
Hispanic***	30456 (13%)	21725 (13%)
missing	n=30074	n=0
HS Education***	164153 (62%)	105755 (65%)
missing	n=7505	n=0
Married***	42376 (19%)	37988 (23%)
missing	n=46685	n=0
Employed***	76133 (29%)	62813 (29%)
missing	n=5325	n=0
Unstably housed***	81587 (31%)	66890 (41%)
missing	n=9355	n=0
Age		
<18*	30396 (11%)	14646 (9%)
18-24***	54197 (20%)	31165 (19%)
25-34	71340 (26%)	42935 (26%)
35-44***	57560 (21%)	35959 (22%)
≥45***	57258 (21%)	37537 (23%)
missing	n=0	n=0
Program Type		
Outpatient***	196290 (73%)	99686 (61%)
Detox***	42731 (16%)	42280 (26%)
Rehab***	31706 (12%)	20276 (13%)
missing	n=24	n=0
Patient receiving MAT***	5901 (2%)	2232 (1%)
missing	n=24875	n=0

Psych Problems***	98042 (45%)	40914 (25%)
missing	n=52097	n=0
Drug use reported at admit		
Heroin***	20136 (7%)	4219 (3%)
missing	n=0	n=0
Non prescription Methadone***	1857 (1%)	952 (1%)
missing	n=0	n=0
Synthetic opioids***	42859 (16%)	17263 (11%)
missing	n=0	n=0

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
Any opiates***	16673 (6%)	5694 (6%)
missing	n=0	n=0
Cocaine/Crack***	65011 (24%)	33899 (21%)
missing	n=0	n=0
Benzodiazepine***	8713 (3%)	4045 (2%)
missing	n=0	n=0
# of subs reported at admit		
0***	22340 (8%)	439 (<1%)
1***	127338 (47%)	78996 (49%)
2***	74163 (27%)	47490 (29%)
3***	46910 (17%)	35317 (22%)
missing	n=0	n=0
IDU***	20205 (7%)	10765 (7%)
missing	n=22771	n=0
Client Insurance Type		
Medicaid	12495 (18%)	16997 (10%)
Medicare***	3958 (6%)	11115 (7%)
No insurance***	42205 (61%)	110369 (68%)
Private Insurance***	11008 (16%)	23761 (15%)
missing	n=201085	n=0
Primary Source of Income		
Public Assistance***	7783 (3%)	7231 (4%)
Retirement/Pension***	20073 (9%)	11092 (7%)
Other Income***	38016 (16%)	17640 (11%)
No income***	95252 (41%)	52664 (32%)

Salary***	72101 (31%)	73615 (45%)
missing	n=113201	n=0
Continuous variables		
Days Waiting to Enter Treatment***	15.71 (105.5)	5.18 (18.07)
Per capita Income***	$38,753 ($3,057)	$39,302 ($4,464)
Rate of methadone programs/10K pop*	2.51 (1.49)	1.94 (1.01)
Rate of individuals in tx/1M pop***	12.89 (4.71)	9.45 (3.47)
Percent of residents rec'v Medicaid***	17.84 (3.73)	16.98 (5.65)

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.2 Comparison of Characteristics of Cases with Missing Data on Any Variables Compared to Cases with No Missing Data, Treatment Wait Time and Medicaid Coverage of Methadone Analysis, 1998

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
	N=258,848	N=98,183
	n (%)	n (%)
Medicaid Coverage of Methadone***	134191 (52%)	40577 (41%)
missing	n=0	n=0
Male***	183654 (72%)	69830 (71%)
missing	n=4646	n=0
Race		
White***	157958 (64%)	68747 (70%)
Black***	55657 (22%)	20832 (21%)
Other Race***	35064 (14%)	8604 (9%)
missing	n=10169	n=0
Hispanic***	27462 (11%)	9054 (9%)
missing	n=12213	n=0
HS Education**	136410 (59%)	58507 (60%)
missing	n=27435	n=0
Married***	59240 (25%)	26383 (27%)
missing	n=19467	n=0
Employed***	92304 (39%)	41054 (42%)
missing	n=22935	n=0
Unstably housed***	60828 (28%)	36317 (37%)
missing	n=38811	n=0

Age		
<18*	30417 (12%)	11897 (12%)
18-24***	40139 (16%)	17034 (17%)
25-34***	71268 (28%)	28282 (29%)
35-44***	78759 (30%)	28737 (29%)
≥45***	38265 (15%)	12233 (12%)
missing	n=0	n=0
Program Type		
Outpatient***	159847 (62%)	65471 (67%)
Detox***	75266 (29%)	15227 (16%)
Rehab***	23702 (9%)	17485 (18%)
missing	n=33	n=0
Patient receiving MAT	3348 (1%)	1325 (1%)
missing	n=17473	n=0
Psych Problems***	33719 (20%)	16671 (17%)
missing	n=92145	n=0
Drug use reported at admit		
Heroin***	12029 (5%)	3812 (4%)
missing	n=0	n=0
Non prescription Methadone	357 (<1%)	155 (<1%)
missing	n=0	n=0
Synthetic opioids***	5116 (2%)	2211 (2%)
missing	n=0	n=0

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
Any opiates***	16673 (6%)	5694 (6%)
missing	n=0	n=0
Cocaine/Crack***	63023 (24%)	31240 (32%)
missing	n=0	n=0
Benzodiazepine***	2109 (1%)	1000 (1%)
missing	n=0	n=0
# of subs reported at admit		
0***	17460 (7%)	1710 (2%)
1***	127932 (49%)	43679 (44%)
2***	73909 (29%)	31115 (32%)
3***	39547 (15%)	21679 (22%)
missing	n=0	n=0
IDU***	14765 (6%)	6956 (7%)

missing	n=19081	n=0
Client Insurance Type		
Medicaid	9091 (9%)	8522 (9%)
Medicare***	6494 (6%)	16368 (17%)
No insurance***	78817 (74%)	64433 (66%)
Private Insurance***	12169 (11%)	8860 (9%)
missing	n=152277	n=0
Primary Source of Income		
Public Assistance***	9588 (7%)	5244 (5%)
Retirement/Pension***	6220 (4%)	6803 (7%)
Other Income***	25521 (18%)	10001 (10%)
No income***	42658 (29%)	31226 (32%)
Salary***	61633 (42%)	44909 (46%)
missing	n=113201	n=0
Continuous variables		
Days Waiting to Enter Treatment***	3.38 (28.3)	6.03 (45.0)
Per capita Income***	$26,246 ($2,400)	$24,952 ($1,797)
Rate of methadone programs/10K pop*	1.82 (1.02)	1.43 (0.87)
Rate of individuals in tx/1M pop***	5.61 (2.34)	2.71 (0.98)
Percent of residents rec'v Medicaid***	12.00 (2.91)	13.90 (3.02)

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.3: Descriptive Characteristics of Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Methadone, Combined 19982008

	N=26,100
	n (%)
Individuals in States with Medicaid Coverage of Methadone	11235 (43%)
Male	18429 (71%)
Race	
White	19177 (73%)
Black	4680 (18%)
Other Race	2243 (9%)
Hispanic	3118 (12%)
HS Education	16455 (63%)

Married	6423 (25%)
Employed	10462 (40%)
Unstably housed	10435 (40%)
Age	
<18	2722 (10%)
18-24	4800 (19%)
25-34	7033 (27%)
35-44	6708 (26%)
≥45	4837 (19%)
Program Type	
Outpatient	16649 (64%)
Detox	5706 (22%)
Rehab	3745 (14%)
Patient receiving MAT	324 (1%)
Psych Problems	5738 (22%)
Drug use reported at admit	
Heroin	789 (3%)
Non prescription Methadone	120 (<1%)
Synthetic opioids	1534 (6%)
Any opioids	2270 (9%)
Cocaine/Crack	6628 (25%)
Benzodiazepine	511 (2%)
# of subs reported at admit	
0	245 (1%)
1	12306 (47%)
2	7858 (30%)
3	5691 (22%)
IDU	1792 (7%)
Client Insurance Type	
Medicaid	2515 (10%)
Medicare	2789 (11%)
No insurance	17568 (67%)
Private Insurance	3228 (12%)
Primary Source of Income	
Public Assistance	1223 (5%)
Retirement/Pension	1762 (7%)
Other Income	2749 (11%)
No income	8464 (32%)
Salary	11902 (46%)

Continuous variables	**Mean (SD)**
Days Waiting to Enter Treatment	5.14 (24.66)
Per Capita Income	$33,740 ($7,838)
Rate of methadone programs/10K pop	1.74 (1.00)
Rate of individuals in tx/1M pop	6.82 (4.30)
Percent of residents rec'v Medicaid	15.81 (5.05)

Table 2A.4: Comparison of Characteristics of Bootstrapped Listwise Deletion Sample by Medicaid Coverage of Methadone, Combined 1998-2008

	Medicaid Coverage	No Medicaid Coverage
	N=11,265	N=14,835
	n (%)	n (%)
Male ***	8117 (72%)	10312 (70%)
Race		
White***	8674 (77%)	10503 (71%)
Black***	1522 (14%)	3158 (21%)
Other Race***	1069 (9%)	1174 (8%)
Hispanic***	1976 (18%)	1142 (8%)
HS Education***	7466 (66%)	8989 (61%)
Married***	2502 (22%)	3921 (26%)
Employed	4566 (41%)	5896 (40%)
Unstably housed***	5182 (46%)	5253 (35%)
Age		
≤24***	3005 (27%)	4517 (30%)
25-34*	2933 (26%)	4100 (28%)
35-44*	2965 (26%)	3743 (25%)
≥45***	2362 (21%)	2475 (17%)
Program Type		
Outpatient***	6149 (55%)	10500 (71%)
Detox***	3448 (31%)	2258 (15%)
Rehab	1668 (15%)	2077 (14%)
Patient receiving MAT***	212 (2%)	112 (1%)
Psych Problems	2522 (22%)	3216 (22%)
Drug use reported at admit		
Heroin***	425 (4%)	364 (2%)
Non prescription Methadone***	15 (<1%)	105 (1%)
Any opiates***	811 (7%)	1459 (10%)
Cocaine/Crack	2797 (25%)	3831 (26%)
Synthetic opioids***	439 (4%)	1095 (7%)
Benzodiazepine***	135 (1%)	376 (3%)

# of subs reported at admit		
0***	168 (1%)	77 (1%)
1***	5894 (52%)	6412 (43%)
2*	3307 (29%)	4551 (31%)
3***	1896 (17%)	3795 (26%)
IDU***	591 (5%)	1201 (8%)
Client Insurance Type		
Medicaid***	952 (8%)	1563 (11%)
Medicare***	746 (7%)	2043 (14%)
No insurance***	7421 (66%)	10147 (68%)
Private Insurance***	2146 (19%)	1082 (7%)
Primary Source of Income		
Public Assistance	539 (5%)	684 (5%)
Retirement/Pension***	849 (8%)	913 (6%)
Other Income***	1384 (12%)	1365 (9%)
No income	3588 (32%)	4876 (33%)
Salary***	4905 (44%)	6997 (47%)
Continuous variables		
Days Waiting to Enter Treatment	4.8 (31.7)	5.4 (17.5)
Per capita Income***	$36,453 ($7,967)	$31,681 ($7,075)
Rate of methadone programs/10K pop***	1.95 (0.37)	1.58 (1.27)
Rate of individuals in tx/1M pop***	7.3 (3.8)	6.5 (4.6)
Percent of residents rec'v Medicaid***	14.2 (2.2)	17.0 (6.1)

***=p<0.0001

**=p<0.001 *=p<0.05

Table 2A.5: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Methadone, Combined 1998-2008, N=26,100

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est	Model 6 Estimate (95% CI)	% Diff Est	Model 7 Estimate (95% CI)	% Diff Est
Methadone covered	-0.12 (-0.19,-0.04)**	-11.31	-0.06 (-0.14,0.02)	-5.82	-0.16 (-0.24,-0.08)***	-14.79	-0.18 (-0.26,-0.1)***	-16.47	0.64 (0.55,0.73)***	89.65	0.8 (0.7,0.89)***	122.55	1.16 (1.03,1.29)***	218.99
Male			0.06 (-0.02,0.14)	6.18	0.16 (0.07,0.24)**	17.35	0.15 (0.07,0.23)**	16.18	0.11 (0.02,0.19)*	11.63	0.14 (0.06,0.22)**	15.03	0.14 (0.06,0.22)**	15.03
Race														
Black			0.34 (0.24,0.44)***	40.49	0.21 (0.11,0.31)***	23.37	0.2 (0.1,0.3)***	22.14	-0.03 (-0.13,0.07)	-2.96	-0.03 (-0.13,0.07)	-2.96	-0.04 (-0.14,0.06)	-3.92
Other Race			0.15 (0.02,0.29)*	16.18	0.26 (0.13,0.4)**	29.69	0.29 (0.15,0.42)***	33.64	0.16 (0.03,0.29)*	17.35	0.18 (0.05,0.31)*	19.72	0.13 (0,0.26)* ref	13.88
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	-0.31 (-0.43,-0.19)***	ref
Hispanic			-0.75 (-0.87,-0.63)***	-52.76	-0.85 (-0.97,-0.72)***	-57.26	-0.83 (-0.95,-0.71)***	-56.40	-0.43 (-0.55,-0.31)***	-34.95	-0.34 (-0.46,-0.22)***	-28.82	0 (-0.08,0.08)	-26.66
HS Education			-0.14 (-0.23,-0.06)**	-13.06	-0.09 (-0.18,-0.01)* -	-8.61	-0.08 (-0.16,0.01)	-7.69	-0.01 (-0.09,0.07)	-1.00	0 (-0.08,0.08)	0.00	-0.03 (-0.11,0.06)	0.00
Married			0.08 (-0.01,0.17)	8.33	0.03 (-0.12,0.06)	-2.96	-0.01 (-0.09,0.08)	-1.00	-0.02 (-0.11,0.07)	-1.98	-0.06 (-0.14,0.03)	-5.82	0.22 (0.1,0.33)**	-2.96
Employed			0.27 (0.19,0.35)***	31.00	0.24 (0.16,0.32)***	27.12	0.43 (0.31,0.54)***	53.73	0.28 (0.17,0.39)***	32.31	0.23 (0.12,0.35)***	25.86	0.26 (0.17,0.34)***	24.61
Unstably Housed			0.07 (-0.01,0.16)	7.25	0.13 (0.04,0.21)*	13.88	0.15 (0.07,0.24)**	16.18	0.25 (0.16,0.33)***	28.40	0.24 (0.15,0.32)***	27.12		29.69
Age													0.65 (0.49,0.82)***	
<18			0.58 (0.42,0.75)***	78.60	0.46 (0.3,0.63)***	58.41	0.48 (0.31,0.65)***	61.61	0.61 (0.45,0.78)***	84.04	0.69 (0.52,0.85)***	99.37	0.2 (0.08,0.33)*	91.55
18-24			0.36 (0.24,0.49)***	43.33	0.2 (0.07,0.32)*	22.14	0.22 (0.09,0.35)**	24.61	0.18 (0.06,0.31)*	19.72	0.21 (0.08,0.33)*	23.37	0.23 (0.12,0.34)***	22.14
25-34			0.32 (0.21,0.43)***	37.71	0.23 (0.12,0.34)***	25.86	0.24 (0.13,0.35)***	27.12	0.2 (0.09,0.31)**	22.14	0.24 (0.13,0.35)***	27.12	0.34 (0.23,0.45)*** ref	25.86
35-44			0.24 (0.13,0.35)***	27.12	0.34 (0.23,0.45)***	40.49	0.33 (0.21,0.44)***	39.10	0.28 (0.17,0.39)***	32.31	0.35 (0.24,0.46)***	41.91		40.49
>44 (ref)			ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	-0.66 (-0.78,-0.55)***	ref
Tx Program Type													-2.63 (-2.77,-2.5)*** ref	
Outpatient					-0.26 (-0.37,-0.15)***	-22.89	-0.28 (-0.4,-0.17)***	-24.42	-0.55 (-0.66,-0.44)***	-42.31	-0.65 (-0.77,-0.54)***	-47.80	-1.11 (-1.46,-0.76)***	-48.31
Detox					-2.15 (-2.28,-2.02)***	-88.35	-2.19 (-2.32,-2.06)***	-88.81	-2.47 (-2.6,-2.34)***	-91.54	-2.56 (-2.69,-2.42)***	-92.27	0.09 (-0.01,0.18)	-92.79
Rehab (ref)					ref	ref	ref	ref	ref	ref	ref	ref		ref
Enrolled in MAT					-1.13 (-1.49,-0.78)***	-67.70	-1.08 (-1.44,-0.73)***	-66.04	-1.12 (-1.47,-0.77)***	-67.37	-1.11 (-1.46,-0.76)***	-67.04	-0.09 (-0.68,0.5)	-67.04
Psych Problems					0.24 (0.14,0.33)***	27.12	0.17 (0.07,0.26)**	18.53	0.13 (0.04,0.23)*	13.88	0.09 (0,0.19)	9.42	-0.47 (-1.03,0.09)	9.42
Drug Use													-0.06 (-0.16,0.04)	
Heroin					-0.04 (-0.64,0.56)	-3.92	0.05 (-0.55,0.65)	5.13	-0.14 (-0.73,0.44)	-13.06	-0.05 (-0.64,0.54)	-4.88	-0.29 (-0.88,0.31)	-8.61
Non-rx Methadone					-0.19 (-0.78,0.39)	-17.30	-0.1 (-0.68,0.49)	-9.52	-0.33 (-0.9,0.24)	-28.11	-0.41 (-0.97,0.15)	-33.63	0.07 (-0.19,0.33)	-37.50
Cocaine					0.09 (0,0.19)	9.42	0.06 (-0.04,0.16)	6.18	-0.07 (-0.17,0.02)	-6.76	-0.02 (-0.11,0.08)	-1.98	0.53 (-0.08,1.15)	-5.82
Synthetic Opioids					0.14 (-0.46,0.74)	15.03	0.05 (-0.56,0.65)	5.13	-0.18 (-0.76,0.41)	-16.47	-0.19 (-0.79,0.4)	-17.30		-25.17
Benzodiazepines					0.47 (0.21,0.74)**	60.00	0.42 (0.16,0.68)*	52.20	-0.08 (-0.34,0.18)	-7.69	0.05 (-0.21,0.31)	5.13	-0.71 (-1.08,-0.33)**	7.25
Any Opioids					0.45 (-0.17,1.07)	56.83	0.41 (-0.22,1.03)	50.68	0.44 (-0.17,1.05)	55.27	0.48 (-0.13,1.09)	61.61	0.12 (0.01,0.23)*	69.89
Ttl # of Drugs Used													0.07 (-0.03,0.17) ref	
0					-0.18 (-0.56,0.2)	-16.47	-0.23 (-0.61,0.15)	-20.55	-0.8 (-1.18,-0.43)***	-55.07	-0.57 (-0.95,-0.2)*	-43.45	0.02 (-0.14,0.18)	-50.84
1					0.19 (0.08,0.3)**	20.92	0.13 (0.02,0.24)*	13.88	0.08 (-0.03,0.19)	8.33	0.13 (0.02,0.24)*	13.88		12.75
2					0.07 (-0.04,0.18)	7.25	0.05 (-0.06,0.15)	5.13	0.05 (-0.05,0.16)	5.13	-0.07 (-	7.25		7.25
3 (ref)					ref	ref	ref	ref	ref	ref	0.04,0.17)ref	ref		ref
IDU					-0.1 (-0.28,0.07)	-9.52	-0.1 (-0.27,0.07)	-9.52	0.03 (-0.14,0.19)	3.05	0.01 (-0.15,0.17)	1.01		2.02

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est	Model 6 Estimate (95% CI)	% Diff Est	Model 7 Estimate (95% CI)	% Diff Est
Health Insurance Type							0.49 (0.32,0.66)***	63.23			0.38 (0.21,0.55)***	46.23		36.34
Medicaid							0.05 (-0.1,0.21)	5.13	0.35 (0.19,0.52)***	41.91	0.39 (0.23,0.54)***	47.70		47.70
Medicare							0.39 (0.28,0.51)***	47.70	0.36 (0.21,0.52)***	43.33	0.47 (0.35,0.58)***	60.00	0.31 (0.14,0.48)**	56.83
No Insurance							ref	ref	0.4 (0.29,0.51)***	49.18	ref	ref	0.39 (0.24,0.55)***	ref
Private Insurance (ref)									ref	ref			0.45 (0.34,0.56)***	ref
Primary Income							0.11 (-0.09,0.3)	11.63						0.40
Public Assistance							0.54 (0.34,0.73)***	71.60	-0.02 (-0.21,0.17)	-1.98	-0.01 (-0.2,0.17)	-1.00	0.002 (-0.19,0.19)	55.27
Retirement/Pension							0.33 (0.18,0.47)***	39.10	0.45 (0.26,0.64)***	56.83	0.45 (0.26,0.64)***	56.83	0.44 (0.25,0.63)***	17.35
Other Income Source							0.06 (-0.06,0.17)	6.18	0.25 (0.1,0.39)**	28.40	0.14 (-0.01,0.28)	15.03	0.16 (0.01,0.3)*	-19.75
No Income							ref	ref	-0.19 (-0.31,-0.07)*	-17.30	-0.24 (-0.36,-0.12)***	-21.34	-0.22 (-0.34,-0.1)** ref	ref
Salary (ref)									ref	ref	ref	ref		
State Level Variables														
Per Capita Income									-0.0001 (-0.0001,-0.0001)***	-0.01	-0.0001 (-0.0001,-0.0001)***	-0.01	-0.0001 (-0.0001,-0.0001)***	-0.01
Methadone Prog Rate									-0.49 (-0.54,-0.44)***	-38.74	-0.53 (-0.57,-0.48)***	-41.14	-0.49 (-0.54,-0.45)***	-38.74
Rate of Indiv in Tx									0.1 (0.08,0.11)***	10.52	0.06 (0.04,0.07)***	6.18	0.04 (0.03,0.06)***	4.08
% of res w/Medicaid									0.18 (0.17,0.2)***	19.72	0.15 (0.14,0.17)***	16.18	0.13 (0.12,0.14)***	13.88
Time											1.22 (1.02,1.41)***	238.72	1.63 (1.41,1.85)***	410.39
Medicaid Cov * Time													-0.7 (-0.88,-0.53)***	-50.34

Model 1: Unadjusted association between Medicaid coverage of methadone and wait time for substance use treatment

Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

Model 6: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level variables and time

Model 7: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level variables, time and interaction term

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.6: Model Building Summary Using Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Methadone, Combined 1998-2008, N=260,425

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est	Model 6 Estimate (95% CI)	% Diff Est	Model 7 Estimate (95% CI)	% Diff Est
Methadone covered	-0.03 (-0.06,-0.10)*	-2.96	0.02 (-0.01,0.04)	2.02	-0.14 (-0.16,-0.11)***	-13.06	-0.13 (-0.15,-0.1)***	-12.19	0.72 (0.69,0.75)***	105.44	0.9 (0.87,0.93)***	145.96	1.42 (1.38,1.46)***	313.71
Male			-0.01 (-0.04,0.01)	-1.00	0.07 (0.04,0.1)***	7.25	0.08 (0.06,0.11)***	8.33	0.04 (0.02,0.07)**	4.08	0.05 (0.02,0.07)**	5.13	0.06 (0.03,0.08)***	6.18
Race														
Black			0.22 (0.19,0.26)***	24.61	0.17 (0.14,0.2)***	18.53		17.35	-0.05 (-0.08,-0.02)**	-4.88	-0.05 (-0.08,-0.02)*	-4.88	-0.04 (-0.07,-0.01)*	-3.92
Other Race			0.01 (-0.03,0.06)	1.01	0.2 (0.15,0.24)***	22.14	0.16 (0.13,0.19)***	25.86	0.09 (0.05,0.13)***	9.42	0.09 (0.04,0.13)***	9.42	0.02 (-0.02,0.06)	2.02
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref	ref	ref		
Hispanic			-0.61 (-0.65,-0.57)***	-45.66	-0.7 (-0.74,-0.66)***	-50.34	0.23 (0.18,0.27)***	-50.34	-0.25 (-0.29,-0.21)***	-22.12	-0.15 (-0.19,-0.11)***	-13.93	-0.11 (-0.15,-0.07)***	-10.42
HS Education			-0.14 (-0.17,-0.11)***	-13.06	-0.14 (-0.16,-0.11)***	-13.06	ref	-11.31	-0.07 (-0.1,-0.04)***	-6.76	-0.06 (-0.09,-0.03)***	-5.82	-0.05 (-0.08,-0.03)***	-4.88
Married			0.02 (-0.01,0.05)	2.02	-0.07 (-0.1,-0.04)***	-6.76	-0.7 (-0.74,-0.66)***	-4.88	-0.07 (-0.1,-0.04)***	-3.92	-0.06 (-0.08,-0.03)***	-5.82	-0.01 (-0.04,0.02)	-1.00
Employed			0.19 (0.17,0.22)***	20.92	0.15 (0.12,0.18)***	-6.76	-0.12 (-0.15,-0.1)***	18.53	-0.04 (-0.07,-0.01)*	5.13	0.01 (-0.03,0.04)	1.01	0.01 (-0.03,0.05)	1.01
Unstably Housed			0 (-0.03,0.03)	0.00	-0.02 (-0.05,0)	16.18	-0.05 (-0.08,-0.02)**	-1.00	0.05 (0.02,0.09)*	11.63	0.08 (0.05,0.1)***	8.33	0.12 (0.1,0.15)***	12.75
Age									0.11 (0.08,0.13)***					
<18			0.47 (0.42,0.52)***	60.00	0.27 (0.22,0.32)***	31.00	0.17 (0.14,0.21)***	39.10		47.70	0.47 (0.42,0.52)***	60.00	0.44 (0.39,0.49)***	55.27
18-24			0.3 (0.26,0.34)***	34.99	0.15 (0.11,0.18)***	16.18	-0.01 (-0.04,0.02)	17.35	0.39 (0.33,0.44)***	10.52	0.11 (0.07,0.15)***	11.63	0.1 (0.06,0.13)***	10.52
25-34			0.25 (0.22,0.29)***	28.40	0.21 (0.17,0.24)***	23.37	0.33 (0.28,0.39)***	22.14	0.1 (0.06,0.13)***	15.03	0.17 (0.13,0.2)***	18.53	0.16 (0.12,0.19)***	17.35
35-44			0.19 (0.15,0.22)***	20.92	0.17 (0.13,0.2)***	18.53	0.16 (0.12,0.2)***	-25.92	0.14 (0.11,0.18)***	9.42	0.13 (0.09,0.16)***	13.88	0.12 (0.09,0.16)***	12.75
>44 (ref)			ref	ref	ref	ref	0.2 (0.17,0.24)***	-89.56	0.09 (0.05,0.12)***	ref	ref	ref		
Tx Program Type							0.16 (0.12,0.19)***	-57.26	ref	-46.21				
Outpatient					-0.3 (-0.33,-0.26)***	-25.92	ref	-13.06	-2.52 (-2.56,-2.47)***	-91.95	-0.74 (-0.78,-0.7)***	-52.29	-0.76 (-0.8,-0.73)***	-53.23
Detox					-2.26 (-2.3,-2.22)***	-89.56	-0.3 (-0.34,-0.26)***	-15.63	ref	ref	-2.62 (-2.66,-2.58)***	-92.72	-2.68 (-2.72,-2.64)***	-93.14
Rehab (ref)					ref	ref	-2.26 (-2.3,-2.21)***	16.18	-0.62 (-0.65,-0.58)***	-57.26	-0.78 (-0.88,-0.67)***	-54.16	-0.72 (-0.83,-0.62)***	-51.32
Enrolled in MAT					-0.82 (-0.93,-0.71)***	-55.96	ref	-7.69	-2.52 (-2.56,-2.47)***	20.92	0.15 (0.13,0.18)***	16.18	0.14 (0.11,0.17)***	15.03
Psych problems					0.25 (0.22,0.28)***	28.40	-0.85 (-0.93,-0.75)***	13.88	ref	ref				
Drug Use							0.24 (0.21,0.27)***	49.18	-0.85 (-0.96,-0.74)***	-24.42	-0.18 (-0.34,-0.02)*	-16.47	-0.18 (-0.34,-0.01)*	-16.47
Heroin					-0.12 (-0.29,0.04)	-11.31		78.60	0.19 (0.16,0.22)***	-39.35	-0.49 (-0.68,-0.29)***	-38.74	-0.48 (-0.67,-0.29)***	-38.12
Non-rx Methadone					-0.19 (-0.39,0.01)	-17.30	-0.14 (-0.31,0.03)	32.31		-4.88	-0.02 (-0.05,0.01)	-1.98	-0.06 (-0.09,-0.03)**	-5.82
Cocaine					0.16 (0.13,0.19)***	17.35	-0.17 (-0.37,0.03)		-0.28 (-0.44,-0.12)**	-25.17	-0.25 (-0.41,-0.09)*	-22.12	-0.29 (-0.45,-0.13)**	-25.17
Synthetic Opioids					-0.06 (-0.22,0.11)	-5.82	0.15 (0.12,0.18)***		-0.5 (-0.7,-0.3)***	-26.66	-0.26 (-0.35,-0.18)***	-22.89	-0.25 (-0.33,-0.17)***	-22.12
Benzodiazepines					0.13 (0.04,0.21)*	13.88	-0.08 (-0.25,0.09)		-0.05 (-0.08,-0.03)**	40.49	0.28 (0.12,0.45)**	32.31	0.27 (0.1,0.44)*	31.00
Any Opioids					0.39 (0.21,0.56)***	47.70	0.13 (0.04,0.21)*		-0.29 (-0.45,-0.13)**					
Ttl # of Drugs Used							0.4 (0.22,0.57)***		-0.31 (-0.4,-0.23)***	-16.47	-0.02 (-0.14,0.11)	-1.98	-0.26 (-0.39,-0.14)***	-22.89
0					0.56 (0.43,0.69)***	75.07			0.34 (0.17,0.51)***	13.88	0.16 (0.13,0.2)***	17.35	0.13 (0.1,0.17)***	13.88
1					0.29 (0.25,0.32)***	33.64	0.58 (0.45,0.7)***							
							0.28 (0.24,0.32)***		-0.18 (-0.3,-0.06)*					
									0.13 (0.1,0.16)***					

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est	Model 6 Estimate (95% CI)	% Diff Est	Model 7 Estimate (95% CI)	% Diff Est

2			0.13 (0.09,0.16)***	13.88	0.12	12.75	0.09	9.42	0.08 (0.05,0.12)***	8.33	0.08 (0.05,0.11)***	8.33
3 (ref)			ref	ref	(0.08,0.15	ref	(0.06,0.1	ref	0 (0,0)	0.00	0 (0,0)	0.00
IDU			0.01 (-0.05,0.06)	1.01	)*** ref	2.02	2)*** ref	25.86	0.22 (0.17,0.27)***	24.61	0.23 (0.18,0.28)***	25.86
Health Insurance Type					0.02 (-0.04,0.07)	39.10	0.23 (0.18,0.28)***	20.92	0.19 (0.14,0.24)***	20.92	0.08 (0.02,0.13)*	8.33
Medicaid					0.33	9.42	0.19 (0.14,0.24)***	41.91	0.36 (0.31,0.41)***	43.33	0.34 (0.29,0.39)***	40.49
Medicare					(0.28,0.38)***	37.71	0.35 (0.3,0.4)***	33.64	0.32	37.71	0.29 (0.26,0.33)*** ref	33.64
No insurance					0.09 (0.04,0.14)**	ref	0.29	ref	(0.29,0.3	ref		ref
Private Insurance (ref)					0.32		(0.25,0.3		6)*** ref		0.01 (-0.05,0.07)	
Primary Income					(0.29,0.36	4.08	2)*** ref	-6.76		-5.82	0.02 (-0.04,0.07)	1.01
Public Asstistance					)*** ref	13.88		3.05	-0.06 (-0.12,0)*	0.00	0.09 (-0.14,-0.05)***	2.02
Retirement/Pension						11.63	-0.07 (-0.13,-0.01)*	1.01	0 (-0.05,0.06)	-11.31	-0.32 (-0.35,-0.28)*** ref	-8.61
Other Income Source					0.04 (-0.02,0.11)	-8.61	0.03 (-0.02,0.09)	-25.92	-0.12 (-0.17,-0.08)***	-30.23		-27.39
No Income					0.13	ref	0.01 (-0.04,0.05)	ref	-0.36 (-0.39,-	ref	'-0.0001 (-0.0001,-0.0001)***	ref
Salary (ref)					(0.07,0.19)***		-0.3 (-0.34,-		0.32)***		-0.51 (-0.52,-0.49)***	
State Level Variables					0.11		0.27)***	-0.01	ref	-0.01	0.02 (0.02,0.03)***	-0.01
Per Capita Income					(0.06,0.15)***		ref	-41.14		-43.45	0.14 (0.13,0.14)***	-39.95
Methadone Prog Rate					-0.09 (-0.12,-			9.42	-0.0001 (-0.0001,-	5.13	1.86 (1.79,1.92)***	2.02
Rate of Indiv in Tx					0.05)***		'-0.0001 (-0.0001,-	22.14	0.0001)***	18.53	-1.05 (-1.1,-0.99)***	15.03
% of res w/Medicaid					ref		0.0001)***		-0.57 (-0.58,-0.55)***	238.72		542.37
Time							-0.53 (-0.54,-0.51)***		0.05 (0.04,0.05)***			-65.01
Medicaid Cov * Time							0.09 (0.08,0.09)***		0.17 (0.17,0.17)***			
							0.2 (0.2,0.2)***		1.22 (1.15,1.28)***			

Model 1: Unadjusted association between Medicaid coverage of methadone and wait time for substance use treatment

Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

Model 6: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level variables and time

Model 7: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level variables, time and interaction term

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.7: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Methadone, 2008, N=24,400

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est

Methadone Covered	-0.68 (-0.75,-0.60)***	-49.09	-0.61 (-0.69,-0.53)***	-45.66	-0.96 (-1.04,-0.88)***	-61.71	-0.98 (-1.06,-0.9)***	-62.47	1.34 (1.19,1.49)***	281.90
Male			-0.07 (-0.15,0.01)	-6.76	-0.04 (-0.12,0.04)	-3.92	-0.03 (-0.1,0.05)	-2.96	-0.11 (-0.19,-0.04)*	-10.42
Race										
Black			0.17 (0.07,0.27)**	18.53	0.06 (-0.03,0.16)	6.18	0.07 (-0.03,0.17)	7.25	0.1 (0.004,0.2)*	10.52
Other Race			-0.24 (-0.38,-0.11)**	-	0 (-0.12,0.13)ref	0.00	-0.13 (-0.26,0.005)*	-12.19	-0.61 (-0.74,-0.48)***	-45.66
White (ref)			21.34 ref		-0.65 (-0.76,-0.54)***	ref	ref	ref	ref	ref
Hispanic			ref		-0.1 (-0.18,-0.03)*	-47.80	-0.65 (-0.75,-0.54)***	-47.80	-0.1 (-0.22,0.01)	-9.52
HS Education			-0.62 (-0.73,-0.51)***	-46.21	0.1 (0.01,0.18)*	-9.52	-0.1 (-0.17,-0.02)*	-9.52	-0.14 (-0.22,-0.07)**	-13.06
Married			-0.07 (-0.15,0.02)	-6.76	0.13 (0.05,0.2)*	10.52	0.12 (0.03,0.2)*	12.75	0.06 (-0.02,0.15)	6.18
Employed			0.1 (0.01,0.19)*	10.52	0.18 (0.1,0.26)***	13.88	0.16 (0.05,0.28)*	17.35	-0.02 (-0.13,0.09)	-1.98
Unstably Housed			0.19 (0.11,0.27)***	20.92		19.72	0.19 (0.11,0.27)***	20.92	0.2 (0.12,0.28)***	22.14
Age			0.15 (0.07,0.24)**	16.18	-0.15 (-0.31,0.01)					
<18					0.09 (-0.02,0.2)	-13.93	-0.16 (-0.32,0.01)	-14.79	-0.16 (-0.33,0)*	-14.79
18-24			0.27 (0.11,0.43)*	31.00	0.1 (-0.001,0.2)*	9.42	0.1 (-0.01,0.21)	10.52	0.02 (-0.09,0.13)	2.02
25-34			0.25 (0.14,0.37)***	28.40	0.1 (-0.01,0.2)	10.52	0.1 (0.001,0.21)*	10.52	0.16 (0.06,0.26)*	17.35
35-44			0.2 (0.1,0.3)**	22.14	ref	10.52	0.1 (-0.001,0.2)* ref	10.52	0.15 (0.05,0.25)* ref	16.18
>44 (ref)			0.17 (0.06,0.27)*			ref		ref		ref
Tx Program Type			18.53 ref		-0.27 (-0.38,-0.16)***		-0.33 (-0.44,-0.22)***		-1.12 (-1.23,-1)***	
Outpatient			ref		-2.75 (-2.87,-2.62)***	-23.66	-2.78 (-2.91,-2.66)***	-28.11	-3.43 (-3.56,-3.3)***	-67.37
Detox					ref	-93.61	ref	-93.80	ref	-96.76
Rehab (ref)					-0.73 (-1.02,-0.44)***	ref	-0.8 (-1.1,-0.51)***	ref	-0.71 (-1.01,-0.41)***	ref
Enrolled in MAT					0.33 (0.25,0.42)***	-51.81	0.31 (0.23,0.4)***	-55.07	0.01 (-0.07,0.09)	-50.84
Psych Problems						39.10		36.34		1.01
Drug Use					-0.79 (-1.37,-0.22)*		-0.76 (-1.32,-0.19)*		-0.19 (-0.75,0.36)	
Heroin					-0.62 (-1.11,-0.12)*	-54.62	-0.58 (-1.08,-0.07)*	-53.23	-0.41 (-0.91,0.08)	-17.30
Non-rx Methadone					0.11 (0.01,0.2)*	-46.21	0.09 (-0.01,0.18)	-44.01	0.18 (0.09,0.27)***	-33.63
Cocaine					-0.71 (-1.28,-0.15)*	11.63	-0.66 (-1.22,-0.1)*	9.42	-0.51 (-1.06,0.04)	19.72
Synthetic Opioids					0.01 (-0.21,0.23)	-50.84	0.04 (-0.18,0.26)	-48.31	0.07 (-0.14,0.29)	-39.95
Benzodiazepines					0.56 (-0.02,1.14)	1.01	0.52 (-0.05,1.1)	4.08	0.34 (-0.22,0.91)	7.25
Any Opioids						75.07		68.20		40.49
Ttl # of Drugs Used					0.71 (-0.01,1.43)*		0.65 (-0.06,1.37)		0.8 (0.12,1.48)*	
0					-0.07 (-0.18,0.03)	103.40	-0.12 (-0.23,-0.02)*	91.55	0.22 (0.12,0.32)***	122.55
1					0.06 (-0.04,0.16) ref	-6.76	0.01 (-0.09,0.11) ref	-11.31	0.25 (0.15,0.35)***	24.61
2					0.29 (0.13,0.45)**	6.18	0.3 (0.14,0.46)**	1.01	ref	28.40
3 (ref)						ref		ref	0.23 (0.08,0.38)*	ref
IDU						33.64	0.11 (-0.04,0.26)	34.99		25.86
Health Insurance Type							0.82 (0.67,0.98)***		-0.03 (-0.18,0.11)	
Medicaid							0.27 (0.17,0.38)***	11.63	0.54 (0.39,0.69)***	-2.96
Medicare							ref	127.05	0.16 (0.06,0.26)* ref	71.60
No Insurance								31.00		17.35
Private Insurance (ref)							0.14 (-0.05,0.34)	ref	-0.2 (-0.38,-0.01)*	ref
Primary Income							0.03 (-0.14,0.21)		-0.3 (-0.46,-0.13)**	
Public Assistance							0.28 (0.15,0.42)***	15.03	-0.24 (-0.38,-0.1)**	-18.13
Retirement/Pension							-0.09 (-0.21,0.02) ref	3.05	-0.52 (-0.64,-0.4)***	-25.92
Other Income Source								32.31	ref	-21.34
No Income								-8.61		-40.55
Salary (ref)								ref	-0.0002 (-0.0002,-0.0001)***	ref
State Level Variables									-0.04 (-0.11,0.03)	
Per Capita Income									0.22 (0.2,0.25)***	-0.02
Methadone Prog Rate									0.08 (0.07,0.09)***	-3.92
Rate of Indiv in Tx									-0.08 (-0.08,-0.07)***	24.61
% of res w/Medicaid										8.33
SABG										-7.69

Model 1: Unadjusted association between Medicaid coverage of methadone and wait time for substance use treatment

Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.8: Model Building Summary Using Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Methadone, 2008, N=162,242

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est

Methadone Covered	-0.64 (-0.67,-0.61)***	-47.32	-0.62 (-0.65,-0.59)***	-46.21	-0.94 (-0.97,-0.91)***	-60.94	-0.95 (-0.98,-0.92)***	-61.33	1.27 (1.22,1.33)***	256.09
Male			-0.03 (-0.06,-0.005)*	-2.96	0.04 (0.01,0.07)*	4.08	0.05 (0.02,0.07)*	5.13	-0.03 (-0.06,-0.001)*	-2.96
Race										
Black			0.09 (0.06,0.13)***	9.42	0.04 (0,0.08)*	4.08	0.05 (0.02,0.09)*	5.13	0.09 (0.05,0.12)***	9.42
Other Race			-0.06 (-0.11,-0.01)*	-5.82	0.16 (0.11,0.21)***	17.35	0.05 (0.001,0.1)*	5.13	-0.39 (-0.44,-0.34)***	-32.29
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			-0.77 (-0.81,-0.73)***	-53.70	-0.78 (-0.82,-0.74)***	-54.16	-0.76 (-0.8,-0.72)***	-53.23	-0.16 (-0.2,-0.12)***	-14.79
HS Education			-0.13 (-0.16,-0.1)***	-12.19	-0.14 (-0.17,-0.11)***	-13.06	-0.14 (-0.17,-0.11)***	-13.06	-0.14 (-0.16,-0.11)***	-13.06
Married			0.16 (0.13,0.2)***	17.35	0.09 (0.05,0.12)***	9.42	0.08 (0.05,0.11)***	8.33	0.04 (0.01,0.07)*	4.08
Employed			0.18 (0.15,0.21)***	19.72	0.1 (0.07,0.13)***	10.52	0.09 (0.04,0.13)**	9.42	-0.16 (-0.2,-0.11)***	-14.79
Unstably Housed			0.19 (0.15,0.22)***	20.92	0.14 (0.11,0.17)***	15.03	0.16 (0.13,0.19)***	17.35	0.16 (0.13,0.19)***	17.35
Age										
<18			0.26 (0.2,0.32)***	29.69	-0.15 (-0.21,-0.09)***	-13.93	-0.2 (-0.26,-0.14)***	-18.13	-0.18 (-0.24,-0.12)***	-16.47
18-24			0.38 (0.33,0.42)***	46.23	0.15 (0.11,0.19)***	16.18	0.14 (0.1,0.19)***	15.03	0.04 (0,0.08)*	4.08
25-34			0.31 (0.28,0.35)***	36.34	0.14 (0.1,0.18)***	15.03	0.14 (0.1,0.18)***	15.03	0.13 (0.09,0.17)***	13.88
35-44			0.2 (0.16,0.24)***	22.14	0.1 (0.07,0.14)***	10.52	0.1 (0.06,0.14)***	10.52	0.09 (0.05,0.12)***	9.42
>44 (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Tx Program Type										
Outpatient					-0.33 (-0.37,-0.29)***	-28.11	-0.38 (-0.42,-0.34)***	-31.61	-1.07 (-1.11,-1.02)***	-65.70
Detox					-2.75 (-2.8,-2.7)***	-93.61	-2.79 (-2.84,-2.74)***	-93.86	-3.36 (-3.41,-3.31)***	-96.53
Rehab (ref)					ref	ref	ref	ref	ref	ref
Enrolled in MAT					-0.75 (-0.87,-0.64)***	-52.76	-0.76 (-0.88,-0.65)***	-53.23	-0.61 (-0.72,-0.49)***	-45.66
Psych Problems					0.33 (0.3,0.36)***	39.10	0.32 (0.29,0.35)***	37.71	0.04 (0.01,0.07)*	4.08
Drug Use										
Heroin					-0.44 (-0.62,-0.26)***	-35.60	-0.44 (-0.62,-0.27)***	-35.60	-0.13 (-0.3,0.04)	-12.19
Non-rx Methadone					-0.23 (-0.43,-0.04)*	-20.55	-0.23 (-0.42,-0.03)*	-20.55	-0.26 (-0.45,-0.07)*	-22.89
Cocaine					-0.04 (-0.08,0)*	-3.92	-0.04 (-0.08,-0.01)*	-3.92	0.13 (0.09,0.16)***	13.88
Synthetic Opioids					-0.28 (-0.46,-0.1)*	-24.42	-0.32 (-0.5,-0.14)**	-27.39	-0.21 (-0.39,-0.04)*	-18.94
Benzodiazepines					-0.08 (-0.17,0)	-7.69	-0.04 (-0.12,0.05)	-3.92	0.06 (-0.02,0.14)	6.18
Any Opioids					0.25 (0.06,0.44)	28.40	0.29 (0.1,0.47)*	33.64	0.14 (-0.04,0.32)	15.03
	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-0.38 (-0.62,-0.14)*	-31.61	-0.33 (-0.57,-0.09)*	-28.11	-0.3 (-0.53,-0.07)*	
0					-0.16 (-0.2,-0.12)***	-14.79	-0.17 (-0.21,-0.13)***	-15.63	0.11 (0.07,0.15)***	-25.92
1					0.02 (-0.02,0.05)	2.02	0 (-	0.00	0.11 (0.08,0.15)***	11.63
2					ref	ref	0.04,0.04)ref	ref	ref	11.63
3 (ref)					0.25 (0.19,0.31)***	28.40	0.25 (0.19,0.31)***	28.40	0.27 (0.21,0.32)***	ref
IDU										31.00
Health Insurance Type							0.2 (0.14,0.26)***	22.14	0.12 (0.07,0.18)***	
Medicaid							0.76 (0.7,0.82)***	113.83	0.57 (0.51,0.62)***	12.75
Medicare							0.31 (0.27,0.35)***	36.34	0.28 (0.24,0.32)***	76.83
No Insurance							ref	ref	ref	32.31
Private Insurance (ref)										ref
Primary Income							0 (-0.07,0.07)	0.00	-0.34 (-0.41,-0.27)***	
Public Assistance							-0.08 (-0.15,-0.01)*	-7.69	-0.38 (-0.44,-0.32)***	-28.82
Retirement/Pension							0.22 (0.17,0.28)***	24.61	-0.24 (-0.29,-0.19)***	-31.61
Other Income Source							-0.17 (-0.22,-0.13)***	-15.63	-0.58 (-0.63,-0.54)***	-21.34
No Income							ref	ref	ref	-44.01
Salary (ref)										ref
State Level Variables									'-0.0002 (-0.0002,-	
Per Capita Income									0.0002)***	-0.02
Methadone Prog Rate									-0.07 (-0.1,-0.05)***	-6.76
Rate of Indiv in Tx									0.21 (0.2,0.22)***	23.37
% of res w/Medicaid									0.08 (0.07,0.08)***	8.33
SABG									-0.07 (-0.08,-0.07)***	-6.76

Model 1: Unadjusted association between Medicaid coverage of methadone and wait time for substance use treatment

Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.9: Model Building Summary Using Multiple Imputation Sample for Treatment Wait Time and Medicaid Coverage of Methadone, 2008, N=2,034,778

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est

Methadone Covered	1.03 (1.02,1.04)***	179.13	0.94 (0.93,0.95)***	156.00	0.72 (0.71,0.74)***	105.44	0.7 (0.69,0.71)***	101.38	0.41 (0.39,0.42)***	50.68
Male			-0.04 (-0.05,-0.03)***	-3.92	0.08 (0.07,0.1)***	8.33	0.03 (0.02,0.04)***	3.05	0.05 (0.04,0.06)***	5.13
Race										
Black			0.16 (0.15,0.18)***	17.35	0.13 (0.11,0.14)***	13.88	0.11 (0.09,0.12)***	11.63	-0.03 (-0.04,-0.01)**	-2.96
Other Race			-0.19 (-0.21,-0.17)***	-17.30	-0.17 (-0.2,-0.15)***	-15.63	-0.23 (-0.25,-0.21)***	-20.55	-0.09 (-0.11,-0.07)*** ref	-8.61
White (ref) Hispanic			ref	ref	ref	ref	ref	ref	-0.28 (-0.29,-0.26)***	ref
HS Education			-0.31 (-0.32,-0.29)***	-26.66	-0.33 (-0.35,-0.31)***	-28.11	-0.4 (-0.42,-0.39)***	-32.97	0.003 (-0.01,0.01)	-24.42
Married			-0.08 (-0.09,-0.07)***	-7.69	-0.07 (-0.08,-0.06)***	-6.76	-0.02 (-0.04,-0.01)***	-1.98	0.08 (0.07,0.09)***	0.30
Employed			0.02 (0.004,0.03)*	2.02	-0.01 (-0.02,0.01)	-1.00	0.02 (0.01,0.04)**	2.02	0.07 (0.05,0.09)***	8.33
Unstably Housed			-0.01 (-0.02,0.003)	-1.00	0.04 (0.02,0.05)***	4.08	0.08 (0.06,0.1)***	8.33	-0.03 (-0.04,-0.01)***	7.25
Age			-0.16 (-0.17,-0.14)	-14.79	-0.18 (-0.19,-0.17)***	-16.47	-0.22 (-0.24,-0.21)***	-19.75		-2.96
<18									0.6 (0.58,0.63)***	
18-24			0.77 (0.75,0.79)***	115.98	0.54 (0.51,0.56)***	71.60	0.72 (0.7,0.74)***	105.44	0.17 (0.15,0.18)***	82.21
25-34			0.21 (0.19,0.23)***	23.37	0.18 (0.16,0.2)***	19.72	0.19 (0.18,0.21)***	20.92	0.05 (0.04,0.07)***	18.53
35-44			0.1 (0.09,0.12)***	10.52	0.08 (0.07,0.1)***	8.33	0.07 (0.05,0.08)***	7.25	-0.01 (-0.02,0.01) ref	5.13
>44 (ref)			0.04 (0.02,0.05)***	4.08	0.01 (0,0.03) ref	1.01	0.01 (-0.004,0.03) ref	1.01		-1.00
Tx Program Type			ref	ref		ref		ref	-0.2 (-0.22,-0.19)***	ref
Outpatient					-0.01 (-0.02,0.01)		0.005 (-0.01,0.02)		-0.18 (-0.2,-0.16)*** ref	
Detox					-0.32 (-0.34,-0.31)***	-1.00	-0.24 (-0.26,-0.22)***	0.50	-0.75 (-0.79,-0.71)***	-18.13
Rehab (ref)					ref	-27.39	ref	-21.34	0.48 (0.47,0.49)***	-16.47
Enrolled in MAT					-0.99 (-1.03,-0.96)***	ref	-0.89 (-0.93,-0.86)***	ref		ref
Psych Problems					0.73 (0.72,0.74)***	-62.84	0.5 (0.49,0.51)***	-58.93	0.01 (-0.04,0.06)	-52.76
Drug Use						107.51		64.87	0.08 (0.01,0.14)*	61.61
Heroin					0.19 (0.13,0.24)***		0.12 (0.06,0.17)***		-0.06 (-0.07,-0.04)***	
Non-rx Methadone					0.3 (0.24,0.37)***	20.92	0.19 (0.12,0.25)***	12.75	0.02 (-0.03,0.07)	1.01
Cocaine					0.12 (0.11,0.14)***	34.99	0.08 (0.06,0.09)***	20.92	-0.03 (-0.06,-0.01)*	8.33
Synthetic Opioids					0.15 (0.1,0.2)***	12.75	0.03 (-0.03,0.08)	8.33	-0.04 (-0.09,0.02)	-5.82
Benzodiazepines					0.08 (0.05,0.11)***	16.18	0.06 (0.03,0.08)**	3.05		2.02
Any Opioids					-0.03 (-0.08,0.03)	8.33	0.09 (0.03,0.14)*	6.18		-2.96
						-2.96		9.42		-3.92

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					0.25 (0.22,0.28)***	28.40	0.21 (0.18,0.24)***	23.37		
0					0.25 (0.24,0.27)***	28.40	0.23 (0.22,0.25)***	25.86		3.05
1					0.06 (0.04,0.07)***		0.07 (0.05,0.08)***	7.25		17.35
2						6.18 ref	ref	ref		1.01
3 (ref)					-0.05 (-0.07,-0.02)**	-4.88	-0.07 (-0.09,-0.04)***	-6.76	0.03 (-0.002,0.06)	ref
IDU									0.16 (0.14,0.18)***	-1.00
Health Insurance Type							0.78 (0.76,0.8)***	118.15	0.01 (-0.003,0.03) ref	
Medicaid							1.18 (1.15,1.2)***	225.44	-0.01 (-0.04,0.01)	122.55
Medicare							1.15 (1.14,1.16)***	215.82		222.20
No Insurance							ref	ref	0.8 (0.78,0.82)***	225.44
Private Insurance (ref)									1.17 (1.15,1.19)***	ref
Primary Income							-0.1 (-0.13,-0.07)***	-9.52	1.18 (1.17,1.2)*** ref	
Public Assistance							0.01 (-0.01,0.04)	1.01		-8.61
Retirement/Pension							-0.03 (-0.05,-0.01)*	-2.96	-0.09 (-0.12,-0.06)***	-6.76
Other Income Source							-0.06 (-0.08,-0.04)***	-5.82	-0.07 (-0.1,-0.05)***	-12.19
No Income							ref	ref	-0.13 (-0.15,-0.11)***	-21.34
Salary (ref)									-0.24 (-0.25,-0.22)*** ref	ref
State Level Variables										
Per Capita Income									-0.0001 (0.0001,0.0001)***	-0.01
Methadone Prog Rate									-0.04 (-0.04,-0.03)***	-3.92
Rate of Indiv in Tx									0.06 (0.06,0.06)***	6.18
% of res w/Medicaid									-0.01 (-0.01,-0.01)***	-1.00
SABG									0.01 (0.01,0.01)***	1.01

Model 1: Unadjusted association between Medicaid coverage of methadone and wait time for substance use treatment

Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.10: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Methadone, 1998, N=29,500

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est

Methadone Covered	0.8 (0.72,0.88)***	123.36	0.86 (0.78,0.94)***	136.32	0.78 (0.7,0.869)***	118.15	0.72 (0.63,0.81)***	105.44	-0.91 (-1.23,-0.59)***	-59.75
Male			0.03 (-0.06,0.12)	3.05	0.1 (0.01,0.1903)*	10.52	0.19 (0.1,0.28)***	20.92	0.1 (0.01,0.19)*	10.52
Race										
Black			0.23 (0.13,0.33)***	25.86	0.37 (0.27,0.4749)***	44.77	0.36 (0.26,0.47)***	43.33	0.02 (-0.08,0.12)	2.02
Other Race			-0.41 (-0.57,-0.25)***	-33.63	-0.43 (-0.59,-0.2737)***	-34.95	-0.44 (-0.61,-0.28)***	-35.60	-0.51 (-0.68,-0.35)***	-39.95
White (ref)			ref	ref	ref	ref	ref	ref	0 (0,0)	0.00
Hispanic			-0.34 (-0.5,-0.18)***	-28.82	-0.39 (-0.55,-0.2383)***	-32.29	-0.34 (-0.49,-0.18)***	-28.82	-0.16 (-0.33,0)*	-14.79
HS Education			-0.18 (-0.27,-0.09)**	-16.47	-0.21 (-0.3,-0.1222)***	-18.94	-0.18 (-0.27,-0.09)***	-16.47	-0.18 (-0.27,-0.09)***	-16.47
Married			0.01 (-0.08,0.11)	1.01	0.01 (-0.08,0.1089)	1.01	0.05 (-0.05,0.14)	5.13	0.08 (-0.01,0.17)	8.33
Employed			0.33 (0.24,0.42)***	39.10	0.23 (0.13,0.3188)***	25.86	0.43 (0.3,0.56)***	53.73	0.37 (0.24,0.49)***	44.77
Unstably Housed			-0.05 (-0.14,0.04)	-4.88	-0.13 (-0.22,-0.035)*	-12.19	-0.11 (-0.2,-0.01)***	-10.42	0.04 (-0.06,0.13)	4.08
Age										
<18			0.79 (0.61,0.97)***	120.34	0.85 (0.67,1.0403)***	133.96	0.99 (0.79,1.19)***	169.12	1.63 (1.43,1.82)***	410.39
18-24			0.08 (-0.08,0.23)	8.33	0.03 (-0.13,0.1855)	3.05	0.11 (-0.05,0.27)	11.63	0.34 (0.19,0.5)***	40.49
25-34			0.15 (0.01,0.29)*	16.18	0.13 (-0.01,0.2728)	13.88	0.17 (0.03,0.31)*	18.53	0.21 (0.07,0.35)*	23.37
35-44			0.18 (0.05,0.32)* ref	19.72	0.17 (0.03,0.3031)* ref	18.53	0.19 (0.06,0.33)* ref	20.92	0.24 (0.11,0.37)**	27.12
>44 (ref)				ref		ref		ref	0 (0,0)	0.00
Tx Program Type					-0.43 (-0.55,-0.315)***		-0.42 (-0.54,-0.3)***			
Outpatient					-2.2 (-2.35,-2.0486)***	-34.95	-2.18 (-2.33,-2.03)***	-34.30	-0.55 (-0.66,-0.43)***	-42.31
Detox					ref	-88.92	ref	-88.70	-2.31 (-2.46,-2.16)***	-90.07
Rehab (ref)					-1.06 (-1.48,-0.6426)***	ref	-1.06 (-1.48,-0.65)***	ref	0 (0,0)	0.00
Enrolled in MAT					-0.08 (-0.19,0.0266)	-65.35	-0.16 (-0.27,-0.04)*	-65.35	-0.84 (-1.23,-0.45)***	-56.83
Psych Problems						-7.69		-14.79	-0.03 (-0.14,0.08)	-2.96
Drug Use					-0.61 (-1.36,0.1459)		-0.56 (-1.3,0.19)			
Heroin					-0.17 (-1.23,0.9006)	-45.66	-0.21 (-1.27,0.84)	-42.88	-1.12 (-1.85,-0.39)* -0.2	-67.37
Non-rx Methadone					0.14 (0.04,0.2525)*	-15.63	0.2 (0.09,0.31)**	-18.94	(-1.21,0.81)	-18.13
Cocaine					-0.32 (-1.02,0.381)	15.03	-0.25 (-0.95,0.44)	22.14	-0.1 (-0.2,0)	-9.52
Synthetic Opioids					-0.06 (-0.46,0.3368)	-27.39	-0.05 (-0.44,0.34)	-22.12	-0.35 (-1.03,0.32)	-29.53
Benzodiazepines					1.17 (0.42,1.9265)*	-5.82	1.05 (0.3,1.79)*	-4.88	-0.43 (-0.81,-0.04)*	-34.95
Any Opioids						222.20		185.77	1.06 (0.33,1.79)*	188.64
	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-0.85 (-1.18,-0.5224)***	-57.26	-0.72 (-1.05,-0.39)***	-51.32		
0					0.68 (0.56,0.807)***	97.39	0.71 (0.58,0.83)***	103.40		-65.35
1					0.22 (0.1,0.3327)**		0.24 (0.13,0.36)***	27.12	-1.06 (-1.38,-0.74)***	22.14
2						24.61 ref	ref	ref	0.2 (0.07,0.32)*	9.42
3 (ref)					-0.53 (-0.73,-0.3384)***	-41.14	-0.54 (-0.74,-0.34)***	-41.73	0.09 (-0.02,0.2) ref	ref
IDU									-0.34 (-0.53,-0.15)**	-28.82
Health Insurance Type							0.08 (-0.12,0.29)	8.33		
Medicaid							-0.79 (-0.96,-0.63)***	-54.62	0.07 (-0.13,0.27)	7.25
Medicare							0.06 (-0.08,0.2) ref	6.18	-0.09 (-0.28,0.1)	-8.61
No Insurance								ref	0.5 (0.36,0.64)***	64.87
Private Insurance (ref)							0.45 (0.24,0.67)***		ref	ref
Primary Income							0.57 (0.36,0.78)***	56.83		
Public Assistance							0.37 (0.21,0.53)***	76.83	0.43 (0.22,0.63)***	53.73
Retirement/Pension							0.23 (0.1,0.37)**	44.77	0.8 (0.59,1)***	122.55
Other Income Source							ref	25.86	0.43 (0.28,0.59)***	53.73
No Income								ref	0.27 (0.14,0.4)***	31.00
Salary (ref)									ref	ref
State Level Variables										
Per Capita Income									0.0005 (0.0004,0.0006)*** -	0.05
Methadone Prog Rate									0.75 (-0.85,-0.66)***	-52.76
Rate of Indiv in Tx									0.13 (0.01,0.25)*	13.88
% of res w/Medicaid									0.61 (0.57,0.64)***	84.04

Model 1: Unadjusted association between Medicaid coverage of methadone and wait time for substance use treatment

Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.11: Model Building Summary Using Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Methadone, 1998, N=98,183

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est

Methadone Covered	0.79 (0.74,0.83)***	119.66	0.87 (0.82,0.92)***	138.69	0.84 (0.79,0.89)***	131.64	0.81 (0.76,0.86)***	124.79	-0.26 (-0.43,-0.08)*	-22.89
Male			0.09 (0.04,0.14)**	9.42	0.15 (0.1,0.2)***	16.18	0.22 (0.17,0.27)***	24.61	0.13 (0.08,0.18)***	13.88
Race										
Black			0.24 (0.18,0.29)***	27.12	0.2 (0.14,0.25)***	22.14	0.2 (0.14,0.25)***	22.14	-0.09 (-0.14,-0.03)*	-8.61
Other Race			-0.17 (-0.26,-0.09)***	-15.63	-0.25 (-0.34,-0.16)***	-22.12	-0.23 (-0.32,-0.15)***	-20.55	-0.31 (-0.4,-0.22)*** ref	-26.66
White (ref)			ref	ref	ref	ref	ref	ref	0.16 (0.07,0.25)**	ref
Hispanic			-0.16 (-0.24,-0.07)**	-14.79	-0.14 (-0.23,-0.06)**	-13.06	-0.09 (-0.18,-0.01)*	-8.61	-0.01 (-0.06,0.04)	17.35
HS Education			-0.08 (-0.13,-0.03)*	-7.69	-0.06 (-0.11,-0.01)*	-5.82	-0.03 (-0.08,0.02)	-2.96	-0.03 (-0.08,0.02)	-1.00
Married			0.02 (-0.03,0.08)	2.02	-0.04 (-0.09,0.01)	-3.92	-0.01 (-0.06,0.04)	-1.00	0.19 (0.12,0.26)***	-2.96
Employed			0.27 (0.22,0.32)***	31.00	0.15 (0.1,0.2)***	16.18	0.21 (0.14,0.28)***	23.37	0.14 (0.09,0.2)***	20.92
Unstably Housed			0 (-0.05,0.05)	0.00	0.04 (-0.01,0.09)	4.08	0.06 (0.01,0.11)*	6.18		15.03
Age									1.52 (1.42,1.63)***	
<18			0.6 (0.5,0.7)***	82.21	0.67 (0.56,0.77)***	95.42	0.77 (0.66,0.88)***	115.98	0.51 (0.42,0.59)***	357.22
18-24			0.07 (-0.02,0.15)	7.25	0.07 (-0.02,0.15)	7.25	0.13 (0.04,0.21)*	13.88	0.39 (0.32,0.47)***	66.53
25-34			0.03 (-0.05,0.11)	3.05	0.15 (0.07,0.23)**	16.18	0.15 (0.08,0.23)***	16.18	0.3 (0.22,0.37)*** ref	47.70
35-44			0.01 (-0.06,0.09) ref	1.01	0.1 (0.02,0.17)* ref	10.52	0.08 (0.01,0.16)* ref	8.33		34.99
>44 (ref)				ref		ref		ref	-0.39 (-0.45,-0.33)***	ref
Tx Program Type					-0.28 (-0.35,-0.22)***		-0.22 (-0.29,-0.16)***		-1.73 (-1.81,-1.65)*** ref	
Outpatient					-1.87 (-1.95,-1.79)***	-24.42	-1.79 (-1.87,-1.71)***	-19.75	-0.77 (-0.98,-0.57)***	-32.29
Detox					ref	-84.59	ref	-83.30	-0.14 (-0.2,-0.08)***	-82.27
Rehab (ref)					-0.87 (-1.09,-0.65)***	ref	-0.97 (-1.19,-0.76)***	ref		ref
Enrolled in MAT					-0.18 (-0.24,-0.12)***	-58.10	-0.23 (-0.29,-0.17)***	-62.09	0.29 (-0.07,0.64)	-53.70
Psych Problems						-16.47		-20.55	-0.33 (-0.87,0.21)	-13.06
Drug Use					0.44 (0.07,0.81)*		0.57 (0.2,0.94)*		-0.18 (-0.24,-0.12)***	
Heroin					-0.11 (-0.67,0.45)	55.27	-0.11 (-0.67,0.45)	76.83	0.08 (-0.26,0.42)	33.64
Non-rx Methadone					0.11 (0.05,0.16)**	-10.42	0.11 (0.05,0.17)**	-10.42	-0.18 (-0.4,0.03)	-28.11
Cocaine					0.1 (-0.25,0.45)	11.63	0.13 (-0.22,0.48)	11.63		-16.47
Synthetic Opioids					0.25 (0.03,0.48)	10.52	0.19 (-0.03,0.41)	13.88		8.33
Benzodiazepines						28.40		20.92		-16.47
	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est
Any Opioids					0.32 (-0.05,0.7)	37.71	0.21 (-0.16,0.58)	23.37	0.01 (-0.35,0.37)	1.01
Ttl # of Drugs Used										
0					0.25 (0.08,0.43)*	28.40	0.32 (0.15,0.5)**	37.71	-0.21 (-0.38,-0.04)*	-18.94
1					0.79 (0.72,0.86)***	120.34	0.79 (0.72,0.86)***	120.34	0.26 (0.2,0.33)***	29.69
2					0.31 (0.25,0.37)***	36.34	0.32 (0.26,0.39)***	37.71	0.13 (0.06,0.19)*** ref	13.88
3 (ref)					ref	ref	ref	ref	-0.28 (-0.39,-0.18)***	ref
IDU					-0.6 (-0.71,-0.49)***	-45.12	-0.61 (-0.72,-0.5)***	-45.66		-24.42
Health Insurance Type									0.06 (-0.05,0.16)	
Medicaid							0.08 (-0.04,0.19)	8.33	0.02 (-0.09,0.13)	6.18
Medicare							-0.71 (-0.81,-0.62)***	-50.84	0.52 (0.44,0.59)*** ref	2.02
No Insurance							0.15 (0.07,0.23)**	16.18		68.20
Private Insurance (ref)							ref	ref	0.32 (0.2,0.43)***	ref
Primary Income									0.68 (0.57,0.79)***	
Public Assistance							0.24 (0.12,0.36)***	27.12	0.21 (0.12,0.29)***	37.71
Retirement/Pension							0.51 (0.4,0.62)***	66.53	0.2 (0.13,0.27)*** ref	97.39
Other Income Source							0.14 (0.05,0.23)	15.03		23.37
No Income							0.09 (0.01,0.16)* ref	9.42	0.0003 (0.0003,0.0004)***	22.14
Salary (ref)								ref	-0.8 (-0.85,-0.75)***	ref
State Level Variables									0.16 (0.09,0.22)***	
Per Capita Income									0.51 (0.49,0.53)***	0.03
Methadone Prog Rate										-55.07
Rate of Indiv in Tx										17.35
% of res w/Medicaid										66.53

Model 1: Unadjusted association between Medicaid coverage of methadone and wait time for substance use treatment Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2A.12: Model Building Summary Using Multiple Imputation Sample for Treatment Wait Time and Medicaid Coverage of Methadone, 1998, N=1,364,735

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est

Methadone Covered	0.70 (0.69,0.71)***	101.23	0.7 (0.69,0.72)***	101.38	0.51 (0.5,0.52)***	66.53	0.45 (0.44,0.47)***	56.83	0.35 (0.33,0.37)***	41.91
Male			0.15 (0.13,0.16)***	16.18	0.19 (0.18,0.21)***	20.92	0.17 (0.16,0.19)***	18.53	0.21 (0.2,0.23)***	23.37
Race										
Black			0.04 (0.02,0.06)***	4.08	0.01 (-0.01,0.02)	1.01	-0.03 (-0.04,-0.01)**	-2.96	-0.14 (-0.16,-0.13)***	-13.06
Other Race			-0.33 (-0.35,-0.31)***	-28.11	-0.14 (-0.16,-0.12)***	-13.06	-0.15 (-0.17,-0.13)***	-13.93	0.08 (0.06,0.1)***	8.33
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			-0.17 (-0.2,-0.15)***	-15.63	-0.36 (-0.39,-0.34)***	-30.23	-0.36 (-0.38,-0.34)*** -	-30.23	-0.39 (-0.41,-0.36)***	-32.29
HS Education			-0.08 (-0.09,-0.07)***	-7.69	-0.09 (-0.1,-0.08)***	-8.61	0.09 (-0.1,-0.07)***	-8.61	-0.06 (-0.08,-0.05)***	-5.82
Married			0.09 (0.08,0.11)***	9.42	0.02 (0.01,0.04)*	2.02	0.02 (0,0.03)*	2.02	-0.06 (-0.07,-0.04)***	-5.82
Employed			0.11 (0.1,0.13)***	11.63	0.1 (0.09,0.12)***	10.52	0.22 (0.2,0.24)***	24.61	0.14 (0.12,0.16)***	15.03
Unstably Housed			0.13 (0.12,0.15)***	13.88	0.04 (0.02,0.05)***	4.08	0.01 (-0.01,0.02)	1.01	-0.03 (-0.05,-0.02)***	-2.96
Age										
<18			0.65 (0.63,0.68)***	91.55	0.57 (0.54,0.6)***	76.83	0.62 (0.59,0.65)***	85.89	0.53 (0.51,0.56)***	69.89
18-24			0.43 (0.41,0.45)***	53.73	0.37 (0.34,0.39)***	44.77	0.4 (0.38,0.42)***	49.18	0.4 (0.37,0.42)***	49.18
25-34			0.38 (0.36,0.4)***	46.23	0.38 (0.36,0.4)***	46.23	0.41 (0.39,0.43)***	50.68	0.38 (0.36,0.4)***	46.23
35-44			0.22 (0.2,0.24)***	24.61	0.23 (0.21,0.25)***	25.86	0.26 (0.24,0.28)***	29.69	0.23 (0.21,0.25)*** ref	25.86
>44 (ref)			ref	ref	ref	ref	ref	ref		ref
Tx Program Type									-0.99 (-1.01,-0.97)***	
Outpatient					-0.64 (-0.66,-0.62)***	-47.27	-0.69 (-0.71,-0.67)*** -	-49.84	-2.03 (-2.05,-2.01)***	-62.84
Detox					-1.84 (-1.86,-1.82)***	-84.12	1.9 (-1.93,-1.88)***	-85.04	0 (0,0)	-86.87
Rehab (ref)					0 (0,0)	0.00	0 (0,0)	0.00	-0.1 (-0.16,-0.05)**	0.00
Enrolled in MAT					-0.1 (-0.15,-0.05)**	-9.52	-0.09 (-0.14,-0.03)*	-8.61	-0.02 (-0.04,-0.01)*	-9.52
Psych Problems					-0.13 (-0.15,-0.12)***	-12.19	-0.18 (-0.2,-0.16)***	-16.47		-1.98
Drug Use									0.11 (0,0.22)*	
Heroin						-13.06	-0.03 (-0.13,0.08)	-2.96	-0.2 (-0.38,-0.03)*	11.63
Non-rx Methadone					-0.14 (-0.25,-0.03)*	-13.06	-0.08 (-0.25,0.09)	-7.69	-0.03 (-0.05,-0.02)**	-18.13
Cocaine					0.14 (-0.31,0.04)	9.42	0.08 (0.07,0.1)***	8.33	0.14 (0.04,0.24)*	-2.96
Synthetic Opioids						23.37	0.25 (0.15,0.35)***	28.40	-0.14 (-0.2,-0.07)***	15.03
Benzodiazepines					0.09 (0.07,0.11)***	12.75	-0.09 (0.03,0.16)*	9.42	-0.01 (-0.12,0.1)	-13.06
Any Opioids					0.21 (0.1,0.31)***	13.88	0.02 (-0.09,0.13)	2.02		-1.00
					0.12 (0.05,0.18)**					
					0.13 (0.02,0.24)*					
	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					0.07 (0.04,0.11)**	7.25	0.05 (0.02,0.09)*	5.13		
0					0.16 (0.14,0.18)***	17.35	0.17 (0.15,0.19)***	18.53		8.33
1					-0.03 (-0.05,-0.02)**	-2.96	-0.03 (-0.05,-0.02)**	-2.96		9.42
2					ref	ref	ref	ref		-5.82
3 (ref)					0.12 (0.09,0.15)***	12.75	0.11 (0.08,0.14)***	11.63	0.08 (0.04,0.12)***	ref
IDU									0.09 (0.07,0.11)***	18.53
Health Insurance Type							0.27 (0.24,0.3)***	31.00	-0.06 (-0.07,-0.04)*** ref	
Medicaid							0.25 (0.22,0.28)***	28.40	0.17 (0.14,0.2)***	2.02
Medicare							0.04 (0.02,0.06)***	4.08		-6.76
No Insurance							ref	ref	0.02 (-0.01,0.05)	-1.00
Private Insurance (ref)									-0.07 (-0.1,-0.04)***	ref
Primary Income							-0.25 (-0.28,-0.22)***	-22.12	-0.01 (-0.03,0.01) ref	
Public Assistance							0.36 (0.33,0.39)***	43.33		9.42
Retirement/Pension							-0.13 (-0.15,-0.1)***	-12.19	0.09 (0.06,0.12)***	11.63
Other Income Source							0.21 (0.19,0.23)***	23.37	0.11 (0.08,0.15)***	8.33
No Income							ref	ref	0.08 (0.05,0.1)***	-5.82
Salary (ref)									-0.06 (-0.08,-0.03)*** ref	ref
State Level Variables										
Per Capita Income									-0.0001 (-0.0001,-0.0001)*	-0.01
Methadone Prog Rate									-0.13 (-0.13,-0.12)***	-12.19
Rate of Indiv in Tx									-0.13 (-0.14,-0.13)***	-12.19
% of res w/Medicaid									0.11 (0.11,0.12)***	11.63

Model 1: Unadjusted association between Medicaid coverage of methadone and wait time for substance use treatment Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates

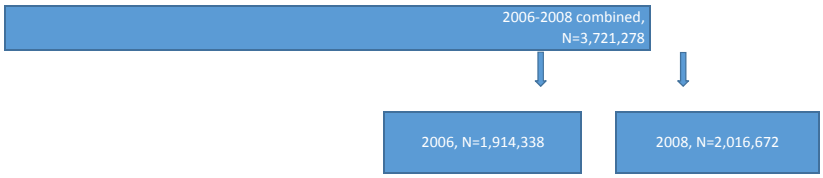
Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Figure 2B.1: Analytic Sample, Treatment Wait Time and Medicaid Coverage of Buprenorphine



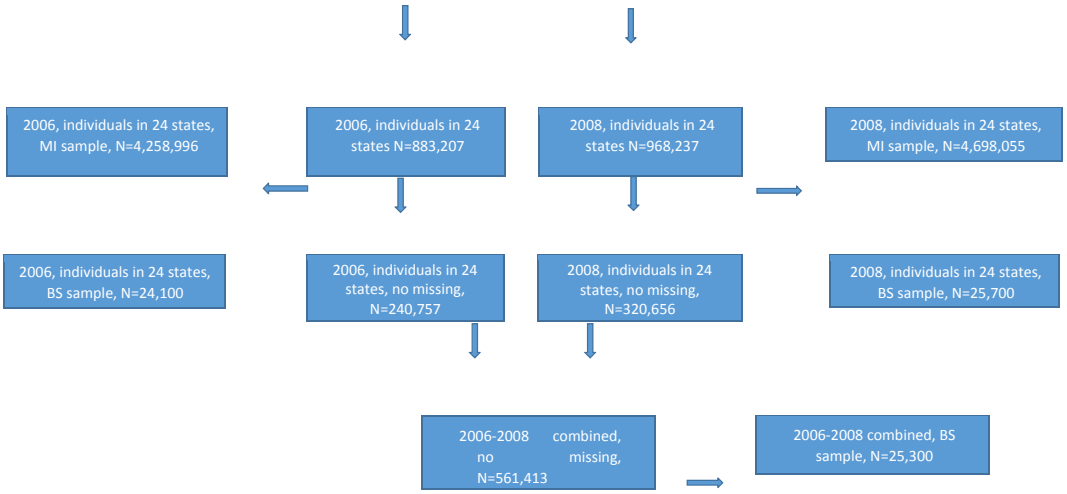

2006, individuals in 24 states, MI sample, N=4,258,996
2006, individuals in 24 states N=883,207
2008, individuals in 24 states N=968,237
2008, individuals in 24 states, MI sample, N=4,698,055
2006, individuals in 24 states, BS sample, N=24,100
2006, individuals in 24 states, no missing, N=240,757
2008, individuals in 24 states, no missing, N=320,656
2008, individuals in 24 states, BS sample, N=25,700
2006-2008 combined, no missing, N=561,413
2006-2008 combined, BS sample, N=25,300

Table 2B.1 Comparison of Characteristics of Cases with Missing Data on Any Variables Compared to Cases with No Missing Data, Treatment Wait Time and Medicaid Coverage of Buprenorphine Analysis, 2008

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
	N=649,612	N=320,694
	n (%)	n (%)
Medicaid Coverage of Buprenorphine**	644921 (99%)	250675 (78%)
missing	n=0	n=0
Male***	422089 (65%)	219679 (69%)
missing	n=203	n=0
Race		
White***	396201 (64%)	215265 (67%)
Black***	124540 (20%)	72914 (23%)
Other Race***	95713 (16%)	32515 (10%)
missing	n=33158	n=0
Hispanic***	117021 (19%)	34008 (11%)
missing	n=31598	n=0
HS Education***	389981 (61%)	210126 (66%)
missing	n=11805	n=0
Married***	73956 (19%)	67037 (21%)
missing	n=253124	n=0
Employed***	155065 (24%)	104298 (33%)
missing	n=8980	n=0
Unstably housed***	259992 (41%)	143422 (45%)
missing	n=11604	n=0
Age		
<18***	67587 (10%)	26259 (8%)
18-24***	120578 (19%)	62089 (19%)
25-34	166420 (26%)	81816 (26%)
35-44***	147584 (23%)	74996 (23%)
≥45***	147442 (23%)	75534 (24%)
missing	n=1	n=0
Program Type		
Outpatient***	439175 (68%)	188000 (59%)
Detox***	108337 (17%)	77886 (24%)
Rehab***	102008 (16%)	54808 (17%)
missing	n=92	n=0
Patient receiving MAT***	46070 (7%)	16254 (5%)
missing	n=31758	n=0

Psych Problems***	146690 (26%)	73249 (23%)
missing	n=91483	n=0
Drug use reported at admit		
Heroin***	101536 (16%)	40347 (13%)
missing	n=0	n=0
Non prescription Methadone***	4684 (1%)	1836 (1%)
missing	n=0	n=0
Synthetic opioids***	56031 (9%)	28286 (8%)
missing	n=0	n=0

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
Any opiates***	148021 (23%)	63890 (20%)
missing	n=0	n=0
Cocaine/Crack***	151756 (23%)	78415 (24%)
missing	n=0	n=0
Benzodiazepine	16211 (3%)	7947 (2%)
missing	n=0	n=0
# of subs reported at admit		
1***	292681 (45%)	152040 (47%)
2***	249214 (38%)	103316 (32%)
3***	83256 (13%)	65336 (20%)
missing	n=0	n=0
IDU***	85288 (14%)	32155 (10%)
missing	n=24452	n=0
Client Insurance Type		
Medicaid	27822 (17%)	47002 (15%)
Medicare***	8401 (5%)	19701 (6%)
No insurance***	103905 (62%)	213149 (66%)
Private Insurance***	27331 (16%)	40842 (13%)
missing	n=201085	n=0
Primary Source of Income		
Public Assistance***	8645 (3%)	17863 (6%)
Retirement/Pension*	21426 (8%)	26258 (8%)
Other Income***	41029 (16%)	31787 (10%)
No income***	102646 (40%)	118490 (37%)
Salary***	81587 (32%)	126296 (39%)

missing	n=394279	n=0
Continuous variables		
Days Waiting to Enter Treatment***	8.74 (65.48)	6.29 (22.66)
Per capita Income***	$41,746 ($5,144)	$41,470 ($4,853)
Rate of bupe programs/10K pop***	7.22 (3.08)	7.57 (6.26)
Rate of individuals in tx/1M pop***	17.55 (10.65)	18.94 (14.91)
Percent of residents rec'v Medicaid***	21.17 (6.53)	17.8 (5.24)
SABG***	141.1 (111.2)	42.36 (29.73)

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2B.2 Comparison of Characteristics of Cases with Missing Data on Any Variables Compared to Cases with No Missing Data, Treatment Wait Time and Medicaid Coverage of Buprenorphine Analysis, 2006

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
	N=643,460	N=240,769
	n (%)	n (%)
Medicaid Coverage of Buprenorphine**	562599 (87%)	120297 (50%)
missing	n=0	n=0
Male***	421756 (66%)	165786 (69%)
missing	n=247	n=0
Race		
White***	410625 (65%)	157930 (66%)
Black***	125140 (20%)	60977 (25%)
Other Race***	100594 (16%)	21862 (9%)
missing	n=7101	n=0
Hispanic***	110260 (17%)	28788 (12%)
missing	n=31598	n=0
HS Education***	387201 (61%)	154228 (64%)
missing	n=11152	n=0
Married***	81091 (20%)	53924 (22%)
missing	n=241524	n=0
Employed***	176582 (28%)	86187 (36%)
missing	n=9344	n=0
Unstably housed***	258626 (42%)	108643 (45%)
missing	n=21471	n=0

Age		
<18***	60925 (9%)	18416 (8%)
18-24***	122551 (19%)	44871 (19%)
25-34**	161976 (25%)	59751 (25%)
35-44***	164008 (25%)	62825 (26%)
≥45***	134000 (21%)	54906 (23%)
missing	n=0	n=0
Program Type		
Outpatient***	431927 (67%)	140729 (58%)
Detox***	108712 (17%)	60553 (25%)
Rehab***	102765 (16%)	39487 (16%)
missing	n=92	n=0
Patient receiving MAT***	40406 (7%)	14459 (6%)
missing	n=46243	n=0
Psych Problems***	126746 (25%)	50654 (21%)
missing	n=144268	n=0
Drug use reported at admit		
Heroin***	96815 (15%)	34283 (14%)
missing	n=0	n=0
Non prescription Methadone	3541 (1%)	1371 (1%)
missing	n=0	n=0
Synthetic opioids***	38095 (6%)	14831 (6%)
missing	n=0	n=0

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
Any opiates***	128273 (20%)	47089 (20%)
missing	n=0	n=0
Cocaine/Crack***	164331 (26%)	66898 (28%)
missing	n=0	n=0
Benzodiazepine***	10867 (2%)	4658 (2%)
missing	n=0	n=0
# of subs reported at admit		
1***	276960 (43%)	116408 (48%)
2***	259462 (40%)	79896 (33%)
3***	82470 (13%)	44465 (18%)
missing	n=0	n=0
IDU***	84036 (14%)	24133 (10%)
missing	n=24551	n=0

Client Insurance Type		
Medicaid	38141 (18%)	36277 (15%)
Medicare***	11934 (6%)	10503 (4%)
No insurance***	134063 (63%)	161765 (67%)
Private Insurance	28811 (14%)	32224 (13%)
missing	n=430511	n=0
Primary Source of Income		
Public Assistance***	10634 (4%)	14773 (6%)
Retirement/Pension***	18455 (8%)	19472 (8%)
Other Income***	38623 (16%)	24009 (10%)
No income***	84673 (35%)	78022 (32%)
Salary***	90401 (37%)	104493 (43%)
missing	n=400674	n=0
Continuous variables		
Days Waiting to Enter Treatment***	8.39 (59.05)	6.75 (28.4)
Per capita Income***	$38,791 ($4,585)	$38,625 ($4,792)
Rate of bupe programs/10K pop***	5.31 (2.12)	6.49 (4.05)
Rate of individuals in tx/1M pop***	14.41 (10.41)	18.41 (16.32)
Percent of residents rec'v Medicaid***	19.9 (6.54)	16.38 (4.85)
SABG***	138.5 (119.3)	45.33 (29.74)

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2B.3: Descriptive Characteristics of Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Methadone, Combined 1998-2008

	N=25,300
	n (%)
Individuals in States with Medicaid Coverage of Buprenorphine	16607 (66%)
Male	17405 (69%)
Race	
White	16744 (66%)
Black	6031 (24%)
Other Race	2525 (10%)
Hispanic	2845 (11%)
HS Education	16307 (64%)
Married	5463 (22%)

Employed	8748 (35%)
Unstably housed	11322 (45%)
Age	
<18	2006 (8%)
18-24	4838 (19%)
25-34	6304 (25%)
35-44	6292 (25%)
≥45	5860 (23%)
Program Type	
Outpatient	14803 (59%)
Detox	6130 (24%)
Rehab	4367 (17%)
Patient receiving MAT	1341 (5%)
Psych Problems	5564 (22%)
Drug use reported at admit	
Heroin	3348 (13%)
Non prescription Methadone	130 (1%)
Cocaine/Crack	6562 (26%)
Synthetic opioids	1788 (7%)
Benzodiazepine	533 (2%)
Any Opioids	4937 (20%)
# of subs reported at admit	
1	12168 (48%)
2	8185 (32%)
3	4947 (20%)
IDU	2534 (10%)
Client Insurance Type	
Medicaid	3746 (15%)
Medicare	1428 (6%)
No insurance	16779 (66%)
Private Insurance	3347 (13%)
Primary Source of Income	
Public Assistance	1406 (6%)
Retirement/Pension	2108 (8%)
Other Income	2458 (10%)
No income	8741 (35%)
Salary	10587 (42%)
Continuous variables	**Mean (SD)**
Days Waiting to Enter Treatment	6.39 (25.2)

Per Capita Income	$40,255 ($5,027)
Rate of buprenorphine programs/10K pop	7.11 (5.46)
Rate of individuals in tx/1M pop	18.75 (15.55)
Percent of residents rec'v Medicaid	17.19 (5.10)
SABG	43.86 (29.77)

Table 2B.4: Comparison of Characteristics of Bootstrapped Listwise Deletion Sample by Medicaid Coverage of Buprenorphine, Combined 2006-2008

	Medicaid Coverage	No Medicaid Coverage
	N=16,607	N=8,693
	n (%)	n (%)
Male	11411 (69%)	5994 (69%)
Race		
White***	10226 (62%)	6518 (75%)
Black***	4466 (27%)	1565 (18%)
Other Race***	1915 (12%)	610 (7%)
Hispanic***	1766 (11%)	1079 (12%)
HS Education*	10624 (64%)	5683 (65%)
Married***	3367 (20%)	2096 (24%)
Employed	5744 (35%)	3004 (35%)
Unstably housed***	7634 (46%)	3688 (42%)
Age		
<18***	1413 (9%)	593 (7%)
18-24*	3114 (19%)	1724 (20%)
25-34***	3825 (23%)	2479 (29%)
35-44*	4210 (25%)	2082 (24%)
≥45***	4045 (24%)	1815 (21%)
Program Type		
Rehab***	2413 (15%)	1954 (22%)
Outpatient***	10924 (66%)	3879 (45%)
Detox***	3270 (20%)	2860 (33%)
Patient receiving MAT***	1149 (7%)	192 (2%)
Psych Problems**	3548 (21%)	2016 (23%)
Drug use reported at admit		
Heroin***	2996 (18%)	352 (4%)
Non prescription Methadone	78 (<1%)	52 (1%)
Any opiates***	3816 (23%)	1121 (13%)
Cocaine/Crack*	4398 (26%)	2164 (25%)
Synthetic opioids***	971 (6%)	817 (9%)
Benzodiazepine***	240 (1%)	293 (3%)

# of subs reported at admit		
1**	8113 (49%)	4055 (47%)
2***	5641 (34%)	2544 (29%)
3***	2853 (17%)	2094 (24%)
IDU*	1606 (10%)	928 (11%)
Client Insurance Type		
Medicaid***	2997 (18%)	749 (9%)
Medicare***	1053 (6%)	375 (4%)
No insurance***	10221 (62%)	6558 (75%)
Private Insurance***	2336 (14%)	1011 (12%)
Primary Source of Income		
Public Assistance***	1097 (7%)	309 (4%)
Retirement/Pension***	1610 (10%)	498 (6%)
Other Income***	1739 (10%)	719 (8%)
No income***	4918 (30%)	3823 (44%)
Salary***	7243 (44%)	3344 (38%)
Continuous variables		
Days Waiting to Enter Treatment***	7.5 (27.2)	4.3 (20.7)
Per capita Income***	$42,582 ($3,831)	$35,810 ($3,925)
Rate of buprenorphine programs/10K pop***	8.2 (6.0)	5.1 (3.3)
Rate of individuals in tx/1M pop***	22.7 (17.6)	11.1 (4.8)
Percent of residents rec'v Medicaid***	16.3 (3.4)	18.9 (7.0)

***p=<0.0001

**p=<0.001 *p=<0.05

Table 2B.5: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Buprenorphine, Combined 2006-2008 Analysis, N=25,300

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est

Bupe covered	0.56 (0.48,0.65)***	75.07	0.6 (0.52,0.68)***	82.21	0.51 (0.43,0.6)***	66.53	0.49 (0.41,0.58)***	63.23	1.28 (1.16,1.41)***	259.66	1.3 (1.17,1.43)***	266.93	1.49 (1.34,1.64)***	343.71
Male			-0.05 (-0.13,0.03)	-4.88	-0.06 (-0.15,0.02)	-5.82	-0.08 (-0.17,0.002)*	-7.69	0.1 (-0.19,-0.02)*	-9.52	-0.1 (-0.19,-0.02)*	-9.52	-0.1 (-0.19,-0.02)*	-9.52
Race														
Black			-0.04 (-0.13,0.06)	-3.92	-0.07 (-0.18,0.03)	-6.76	-0.07 (-0.17,0.03)	-6.76	-0.19 (-0.3,-0.09)**	-17.30	-0.19 (-0.3,-0.09)**	-17.30	-0.2 (-0.3,-0.09)**	-18.13
Other Race			-0.63 (-0.78,-0.49)	-46.74	0.14 (-0.01,0.29)	15.03	0.11 (-0.04,0.26)	11.63	0.04 (-0.1,0.18)	4.08	0.04 (-0.1,0.18)	4.08	0.03 (-0.11,0.17)	3.05
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			0.18 (0.03,0.33)***	19.72	-0.68 (-0.83,-0.54)***	-49.34	-0.67 (-0.81,-0.52)***	-48.83	-0.29 (-0.43,-0.15)***	-25.17	-0.29 (-0.43,-0.15)***	-25.17	-0.3 (-0.44,-0.16)***	-25.92
HS Education			0.04 (-0.05,0.13)	4.08	0.09 (0,0.17)	9.42	0.09 (0,0.18)*	9.42	0.15 (0.06,0.23)**	16.18	0.15 (0.06,0.23)**	16.18	0.16 (0.07,0.25)**	17.35
Married			0.05 (-0.05,0.15)	5.13	-0.03 (-0.13,0.07)	-2.96	0.01 (-0.09,0.1)	1.01	-0.02 (-0.12,0.07)	-1.98	-0.03 (-0.12,0.07)	-2.96	-0.02 (-0.12,0.07)	-1.98
Employed			-0.19 (-0.27,-0.1)***	-17.30	-0.3 (-0.38,-0.21)***	-25.92	-0.44 (-0.56,-0.31)***	-35.60	-0.5 (-0.62,-0.38)***	-39.35	-0.49 (-0.61,-0.38)***	-38.74	-0.49 (-0.61,-0.37)***	-38.74
Unstably Housed			-0.08 (-0.16,0.01)	-7.69	-0.04 (-0.12,0.04)	-3.92	-0.05 (-0.13,0.04)	-4.88	-0.09 (-0.17,0)*	-8.61	-0.09 (-0.17,0)*	-8.61	-0.07 (-0.16,0.02)	-6.76
Age														
<18				80.40		44.77		43.33	0.24 (0.05,0.43)*	27.12	0.24 (0.05,0.43)*	27.12	0.24 (0.05,0.43)*	27.12
18-24			0.59 (0.41,0.77)***	64.87	0.37 (0.19,0.55)***	43.33	0.36 (0.16,0.55)**	41.91	0.35 (0.22,0.47)***	41.91	0.34 (0.22,0.47)***	40.49	0.37 (0.24,0.49)***	44.77
25-34			0.5 (0.38,0.63)***	56.83	0.36 (0.23,0.48)***	49.18	0.35 (0.22,0.48)***	47.70	0.39 (0.27,0.5)***	47.70	0.39 (0.27,0.5)***	47.70	0.4 (0.28,0.51)***	49.18
35-44			0.45 (0.34,0.57)***	23.37	0.4 (0.29,0.52)***	24.61	0.39 (0.27,0.5)***	20.92	0.2 (0.09,0.31)**	22.14	0.2 (0.09,0.31)**	22.14	0.21 (0.1,0.32)**	23.37
>44 (ref)			0.21 (0.1,0.32)**	ref	0.22 (0.11,0.33)**	ref	0.19 (0.08,0.31)**	ref	ref	ref	ref	ref	ref	ref
Tx Program Type			ref		ref		ref							
Outpatient						0.07		-1.00	-0.2 (-0.31,-0.09)**	-18.13	-0.2 (-0.31,-0.09)**	-18.13	-0.19 (-0.3,-0.08)**	-17.30
Detox					-0.001 (-0.109,0.108)	-69.88	-0.01 (-0.12,0.1)	-70.48	-1.71 (-1.84,-1.58)***	-81.91	-1.7 (-1.83,-1.57)***	-81.73	-1.68 (-1.81,-1.55)***	-81.36
Rehab (ref)					-1.2 (-1.32,-1.07)***	ref	-1.22 (-1.34,-1.1)***	ref	ref	ref	ref	ref	ref	ref
Enrolled in MAT					ref	8.33	0.03 (-0.18,0.24)	3.05	-0.11 (-0.31,0.1)	-10.42	-0.11 (-0.31,0.09)	-10.42	-0.13 (-0.33,0.07)	-12.19
Psych problems					0.08 (-0.12,0.29)	12.75	0.14 (0.04,0.23)*	15.03	0.17 (0.08,0.26)**	18.53	0.17 (0.08,0.26)**	18.53	0.19 (0.09,0.28)***	20.92
Drug Use					0.12 (0.03,0.22)*	19.72	0.26 (-0.2,0.72)	29.69	0.51 (0.05,0.96)*	66.53	0.51 (0.05,0.96)*	66.53	0.54 (0.09,0.99)*	71.60
Heroin					0.18 (-0.28,0.63)	-43.45	-0.54 (-1.07,-0.01)*	-41.73	-0.42 (-0.95,0.1)	-34.30	-0.43 (-0.95,0.1)	-34.95	-0.42 (-0.95,0.1)	-34.30
Non-rx Methadone					-0.57 (-1.1,-0.03)*	6.18	0.07 (-0.03,0.17)	7.25	-0.07 (-0.17,0.04)	-6.76	-0.07 (-0.18,0.03)	-6.76	-0.06 (-0.16,0.04)	-5.82
Cocaine					0.06 (-0.04,0.16)	4.08	0.14 (-0.31,0.59)	15.03	0.25 (-0.19,0.7)	28.40	0.26 (-0.19,0.7)	29.69	0.28 (-0.17,0.72)	32.31
Synthetic Opioids					0.04 (-0.4,0.49)	0.00	0.03 (-0.24,0.31)	3.05	-0.14 (-0.4,0.13)	-13.06	-0.15 (-0.41,0.12)	-13.93	-0.17 (-0.44,0.1)	-15.63
Benzodiazepines					0 (-0.27,0.27)	-6.76	-0.13 (-0.6,0.35)	-12.19	-0.48 (-0.95,-0.01)*	-38.12	-0.48 (-0.95,-0.01)*	-38.12	-0.5 (-0.97,-0.04)*	-39.35
Any Opioids					-0.07 (-0.54,0.41)	-12.19	-0.12 (-0.24,0)	-11.31	-0.2 (-0.32,-0.08)*	-18.13	-0.21 (-0.33,-0.08)*	-18.94	-0.2 (-0.32,-0.08)*	-18.13
Ttl # of Drugs Used					-0.13 (-0.26,-0.01)*	5.13	0.06 (-0.05,0.18)	6.18	0.03 (-0.09,0.14)	3.05	0.03 (-0.09,0.14)	3.05	0.03 (-0.08,0.15)	3.05
1					0.05 (-0.06,0.17)	ref	ref	ref	ref	ref	ref	ref	ref	ref
2					ref	-9.52	-0.11 (-0.25,0.03)	-10.42	0.05 (-0.08,0.19)	5.13	0.06 (-0.08,0.2)	6.18	0.04 (-0.1,0.17)	4.08
3 (ref)					-0.1 (-0.24,0.04)									
IDU														
Health Insurance Type														
	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est	Model 6 Estimate (95% CI)	% Diff Est	Model 7 Estimate (95% CI)	% Diff Est
Medicaid							0.4 (0.24,0.56)***	49.18	0.11 (-0.06,0.27)	11.63	0.1 (-0.06,0.27)	10.52	0.1 (-0.07,0.26)	10.52
Medicare							0.43 (0.24,0.63)***	53.73	0.58 (0.39,0.77)***	78.60	0.58 (0.39,0.77)***	78.60	0.6 (0.41,0.79)***	82.21
No insurance							0.34 (0.22,0.46)***	40.49	0.29 (0.16,0.41)***	33.64	0.28 (0.16,0.41)***	32.31	0.27 (0.15,0.4)***	31.00
Private Insurance (ref)							ref	ref	ref	ref	ref	ref	ref	ref
Primary Income								-42.31	-0.52 (-0.72,-0.33)***	-40.55	-0.52 (-0.71,-0.33)***	-40.55	-0.52 (-0.71,-0.33)***	-40.55
Public Asstistance							-0.55 (-0.75,-0.35)***	-18.13	-0.28 (-0.45,-0.1)*	-24.42	-0.27 (-0.44,-0.1)*	-23.66	-0.24 (-0.41,-0.07)*	-21.34
Retirement/Pension							-0.2 (-0.38,-0.02)*	-31.61	-0.42 (-0.58,-0.27)***	-34.30	-0.42 (-0.57,-0.26)***	-34.30	-0.39 (-0.54,-0.23)***	-32.29
Other Income Source							-0.38 (-0.54,-0.23)***	-20.55	-0.41 (-0.53,-0.29)***	-33.63	-0.4 (-0.52,-0.27)***	-32.97	-0.39 (-0.52,-0.27)***	-32.29
No Income							-0.23 (-0.36,-0.11)**	ref	ref	ref	ref	ref	ref	ref
Salary (ref)							ref							
State Level Variables									-0.0001 (-0.0001,-0.0001)***	0.01	-0.0001 (-0.0001,-0.0001)***	0.01	-0.0001 (-0.0001,-0.0001)***	0.01
Per Capita Income									0.06 (0.04,0.08)***	6.18	0.06 (0.05,0.08)***	6.18	0.06 (0.05,0.08)***	0.42
Bupe Prog Rate									0.01 (0,0.01)**	1.01	0.01 (0,0.01)*	1.01	0.004 (-0.002,0.01)	10.52
Rate of Indiv in Tx									0.1 (0.09,0.11)***	10.52	0.1 (0.09,0.11)***	1.01	0.1 (0.09,0.11)***	1.01
% of res w/Medicaid									0.01 (0.01,0.01)***	1.01	0.01 (0.01,0.01)***	-5.82	0.01 (0.01,0.01)***	28.40
SABG											-0.06 (-0.15,0.04)		0.25 (0.1,0.39)*	-38.74
Time													-0.49 (-0.67,-0.31)***	
Medicaid Cov * Time														

Model 1: Unadjusted association between Medicaid coverage of buprenorphine and wait time for substance use treatment

Model 2: Medicaid coverage of buprenorphine and demographic covariates

Model 3: Medicaid coverage of buprenorphine, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

Model 6: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level variables and time

Model 7: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level variables, time and interaction term

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2B.6: Model Building Summary Using Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Buprenorphine, Combined 2006-2008, N=561,413

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est	Model 6 Estimate (95% CI)	% Diff Est	Model 7 Estimate (95% CI)	% Diff Est

Bupe covered	0.56 (0.54,0.58)***	75.33	0.59 (0.58,0.61)***	80.40	0.45 (0.43,0.46)***	56.83	0.44 (0.43,0.46)***	55.27	1.35 (1.33,1.38)***	285.74	1.37 (1.34,1.4)***	293.54	1.54 (1.51,1.57)***	366.46
Male			-0.08 (-0.1,-0.06)***	-7.69	-0.07 (-0.09,-0.06)***	-6.76	-0.06 (-0.08,-0.05)***	-5.82	-0.06 (-0.08,-0.05)***	-5.82	-0.06 (-0.08,-0.05)***	-5.82	-0.06 (-0.08,-0.05)***	-5.82
Race														
Black				-6.76		-5.82		-7.69	-0.21 (-0.23,-0.19)***	-18.94	-0.21 (-0.24,-0.19)***	-18.94	-0.21 (-0.23,-0.19)***	-18.94
Other Race				-46.74		16.18		13.88	0.07 (0.04,0.09)***	7.25	0.07 (0.04,0.1)***	7.25	0.07 (0.04,0.09)***	7.25
White (ref)			-0.07 (-0.09,-0.05)***	ref	-0.06 (-0.08,-0.04)***	ref	-0.08 (-0.1,-0.05)***	ref	ref	ref	ref	ref	ref	ref
Hispanic			-0.63 (-0.66,-0.6)***	16.18	0.15 (0.12,0.18)***	-50.84	0.13 (0.1,0.16)***	-50.84	-0.39 (-0.42,-0.36)***	-32.29	-0.39 (-0.42,-0.36)***	-32.29	-0.4 (-0.43,-0.37)***	-32.97
HS Education			ref	-8.61	ref	-7.69	ref	-4.88	-0.01 (-0.03,0.01)	-1.00	-0.01 (-0.03,0.01)	-1.00	-0.01 (-0.03,0.01)	-1.00
Married			0.15 (0.12,0.18)***	3.05	-0.71 (-0.73,-0.68)***	2.02	-0.71 (-0.74,-0.68)***	4.08	0.04 (0.02,0.06)**	4.08	0.03 (0.02,0.05)**	3.05	0.04 (0.02,0.06)**	4.08
Employed			-0.09 (-0.1,-0.07)***	0.00	-0.08 (-0.1,-0.06)***	-10.42	-0.05 (-0.07,-0.04)***	-15.63	-0.23 (-0.25,-0.2)***	-20.55	-0.22 (-0.25,-0.2)***	-19.75	-0.21 (-0.24,-0.19)***	-18.94
Unstably Housed			0.03 (0.01,0.05)*	-1.98	0.02 (-0.003,0.04)	2.02	0.04 (0.02,0.06)***	0.00	-0.02 (-0.04,-0.004)*	-1.98	-0.02 (-0.04,0)*	-1.98	-0.01 (-0.02,0.01)	-1.00
Age			-0.001 (-0.02,0.02)	49.18	-0.11 (-0.13,-0.09)***	16.18	-0.17 (-0.2,-0.14)***	16.18	0.03 (-0.01,0.06)	3.05	0.03 (-0.01,0.06)	3.05	0.01 (-0.03,0.05)	1.01
<18			-0.02 (-0.04,-0.001)*	40.49	0.02 (0.001,0.04)*	23.37	0.004 (-0.01,0.02)	22.14	0.17 (0.15,0.2)***	18.53	0.17 (0.15,0.2)***	18.53	0.18 (0.15,0.2)***	19.72
18-24				31.00		22.14		18.53	0.14 (0.12,0.17)***	15.03	0.14 (0.12,0.17)***	15.03	0.14 (0.12,0.17)***	15.03
25-34			0.4 (0.36,0.43)***	13.88	0.15 (0.11,0.19)***	11.63	0.15 (0.11,0.19)***	9.42	0.09 (0.07,0.11)***	9.42	0.09 (0.07,0.11)***	9.42	0.09 (0.07,0.11)***	9.42
35-44			0.34 (0.31,0.36)***	ref	0.21 (0.19,0.24)***	ref	0.2 (0.18,0.23)***	ref	ref	ref	ref	ref	ref	ref
>44 (ref)			0.27 (0.25,0.3)***		0.2 (0.18,0.23)***	-4.88	0.17 (0.15,0.2)***	-5.82	-0.31 (-0.33,-0.29)***	-26.66	-0.31 (-0.33,-0.28)***	-26.66	-0.29 (-0.32,-0.27)***	-25.17
Tx Program Type			0.13 (0.11,0.16)***		0.11 (0.09,0.14)***	-75.09	0.09 (0.07,0.12)***	-75.34	-1.93 (-1.96,-1.91)***	-85.49	-1.93 (-1.95,-1.9)***	-85.49	-1.9 (-1.92,-1.87)***	-85.04
Outpatient			ref		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Detox						5.13		4.08	-0.08 (-0.12,-0.04)**	-7.69	-0.08 (-0.12,-0.04)***	-7.69	-0.1 (-0.14,-0.05)***	-9.52
Rehab (ref)						3.05		5.13	0.12 (0.1,0.14)***	12.75	0.13 (0.11,0.15)***	13.88	0.13 (0.11,0.15)***	13.88
Enrolled in MAT						-38.12		-34.95	-0.24 (-0.33,-0.15)***	-21.34	-0.24 (-0.33,-0.15)***	-21.34	-0.23 (-0.32,-0.14)***	-20.55
Psych problems						-36.87		-36.24	-0.38 (-0.48,-0.27)***	-31.61	-0.38 (-0.48,-0.28)***	-31.61	-0.38 (-0.48,-0.27)***	-31.61
Drug Use						-1.00		-1.98	-0.1 (-0.12,-0.07)***	-9.52	-0.1 (-0.12,-0.08)***	-9.52	-0.1 (-0.12,-0.08)***	-9.52
Heroin						-40.55		-37.50	-0.42 (-0.5,-0.33)***	-34.30	-0.42 (-0.51,-0.33)***	-34.30	-0.41 (-0.5,-0.32)***	-33.63
Non-rx Methadone						9.42		13.88	-0.09 (-0.15,-0.04)**	-8.61	-0.1 (-0.15,-0.04)***	-9.52	-0.12 (-0.17,-0.06)***	-11.31
Cocaine						71.60		64.87	0.25 (0.16,0.34)***	28.40	0.26 (0.16,0.35)***	29.69	0.24 (0.14,0.33)***	27.12
Synthetic Opioids														
Benzodiazepines														
Any Opioids														

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-0.29 (-0.32,-0.27)***	-25.17	-0.28 (-0.31,-0.26)***	-24.42	-0.35 (-0.37,-0.32)***	-29.53				
1					-0.01 (-0.03,0.01)	-1.00	-0.01 (-0.03,0.02)	-1.00	-0.05 (-0.07,-0.02)***	-4.88	-0.35 (-0.37,-0.32)***	-29.53	-0.35 (-0.38,-0.33)***	-29.53
2					ref	ref	ref	ref	ref	ref	ref	-4.88	ref	-4.88
3 (ref)					0.06 (0.03,0.09)***	6.18	0.05 (0.02,0.07)*	5.13	0.11 (0.08,0.14)***	11.63	0.11 (0.08,0.14)***	ref	0.11 (0.08,0.14)***	ref
IDU							0.58 (0.54,0.61)***	78.60	0.32 (0.28,0.35)***	37.71	0.31 (0.28,0.35)***	11.63	0.3 (0.27,0.33)***	11.63
Health Insurance Type							0.47 (0.43,0.52)***	60.00	0.57 (0.53,0.61)***	76.83	0.57 (0.53,0.61)***	36.34	0.58 (0.54,0.62)***	34.99
Medicaid							0.43 (0.41,0.46)***	53.73	0.36 (0.34,0.39)***	43.33	0.36 (0.34,0.39)***	76.83	0.35 (0.32,0.37)***	78.60
Medicare							ref	ref	ref	ref	ref	43.33	ref	41.91
No insurance								-24.42	-0.38 (-0.42,-0.34)***	-31.61	-0.38 (-0.42,-0.34)***	ref	-0.38 (-0.42,-0.34)***	ref
Private Insurance (ref)								-15.63	-0.31 (-0.35,-0.27)***	-26.66	-0.3 (-0.34,-0.27)***	-31.61	-0.28 (-0.32,-0.25)***	-31.61
Primary Income								-22.89	-0.26 (-0.29,-0.23)***	-22.89	-0.26 (-0.29,-0.22)***	-25.92	-0.23 (-0.26,-0.2)***	-24.42
Public Asstistance								-13.06	-0.36 (-0.39,-0.34)***	-30.23	-0.35 (-0.38,-0.33)***	-22.89	-0.34 (-0.37,-0.32)***	-20.55
Retirement/Pension								ref	ref	ref	ref	-29.53	ref	-28.82
Other Income Source							-0.28 (-0.32,-0.24)***		-0.0001 (-0.0001,-0.0001)***	0.01	-0.0001 (-0.0001,-0.0001)***	ref	-0.0001 (-0.0001,-0.0001)***	ref
No Income							-0.17 (-0.21,-0.14)***		0.06 (0.05,0.06)***	6.18	0.06 (0.06,0.06)***	0.01	0.06 (0.06,0.06)***	0.01
Salary (ref)							-0.26 (-0.29,-0.22)***		0.01 (0.01,0.01)***	1.01	0.01 (0.01,0.01)***	6.18	0.004 (0.002,0.005)***	6.18
State Level Variables							-0.14 (-0.17,-0.12)***		0.1 (0.1,0.1)***	10.52	0.11 (0.1,0.11)***	1.01	0.1 (0.1,0.11)***	0.50
Per Capita Income							ref		0.01 (0.01,0.01)***	1.01	0.01 (0.01,0.01)***	11.63	0.01 (0.01,0.01)***	10.52
Bupe Prog Rate											0.11 (0.1,0.11)***	1.01	0.22 (0.19,0.25)***	1.01
Rate of Indiv in Tx											0.01 (0.01,0.01)***	-5.82	24.61	
% of res w/Medicaid											-0.06 (-0.08,-0.04)***		-0.45 (-0.49,-0.41)***	-36.24
SABG														
Time														
Medicaid Cov * Time														

Model 1: Unadjusted association between Medicaid coverage of buprenorphine and wait time for substance use treatment

Model 2: Medicaid coverage of buprenorphine and demographic covariates

Model 3: Medicaid coverage of buprenorphine, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

Model 6: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level variables and time

Model 7: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level variables, time and interaction term

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2B.7: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Buprenorphine, 2008, N=25,700

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est
Bupe Covered	0.11 (0.03,0.20)*	11.63	0.11 (0.03,0.2)*	11.63	-0.17 (-0.26,-0.07)**	-15.63	-0.17 (-0.26,-0.08)**	-15.63	1.82 (1.59,2.04)***	517.19
Male			-0.06 (-0.14,0.02)	-5.82	-0.01 (-0.09,0.07)	-1.00	-0.01 (-0.09,0.07)	-1.00	-0.03 (-0.11,0.05)	-2.96
Race										
Black			-0.06 (-0.15,0.04)	-5.82	-0.09 (-0.19,0.01)	-8.61	-0.1 (-0.19,-0.001)*	-9.52	-0.24 (-0.33,-0.14)***	-21.34
Other Race			-0.64 (-0.78,-0.51)*	-47.27	0.17 (0.03,0.3)* ref	18.53	0.11 (-0.03,0.24) ref	11.63	0.13 (-0.002,0.26)* ref	13.88
White (ref)			ref	ref	-0.74 (-0.87,-0.61)***	ref	-0.77 (-0.9,-0.64)***	ref	-0.49 (-0.61,-0.36)***	ref
Hispanic			0.22 (0.09,0.36)***	24.61	-0.14 (-0.22,-0.05)*	-52.29	-0.12 (-0.21,-0.04)*	-53.70	-0.08 (-0.16,-0.0003)*	-38.74
HS Education			-0.15 (-0.24,-0.07)*	-13.93	-0.04 (-0.13,0.05)	-13.06	-0.03 (-0.12,0.06)	-11.31	0.01 (-0.08,0.1)	-7.69
Married			0.02 (-0.07,0.12)	2.02	-0.21 (-0.3,-0.12)***	-3.92	-0.38 (-0.5,-0.27)***	-2.96	-0.43 (-0.54,-0.31)***	1.01
Employed			-0.06 (-0.14,0.03)	-5.82	0.11 (0.03,0.19)*	-18.94	0.09 (0.01,0.17)*	-31.61	-0.1 (-0.18,-0.02)*	-34.95
Unstably Housed			0.07 (-0.01,0.15)	7.25		11.63		9.42		-9.52
Age					-0.27 (-0.44,-0.1)*		-0.27 (-0.45,-0.09)*		-0.05 (-0.23,0.12)	
<18			0.04 (-0.12,0.21)	4.08	0.09 (-0.03,0.21)	-23.66	0.07 (-0.06,0.19)	-23.66	0.07 (-0.05,0.19)	-4.88
18-24			0.19 (0.07,0.3)*	20.92	0.15 (0.04,0.26)*	9.42	0.12 (0.01,0.23)*	7.25	0.12 (0.02,0.23)*	7.25
25-34			0.19 (0.08,0.29)**	20.92	0.06 (-0.05,0.16)***	16.18	0.03 (-0.08,0.14) ref	12.75	0.05 (-0.05,0.16) ref	12.75
35-44			0.11 (0.01,0.22)*	11.63	ref	6.18		3.05		5.13
>44 (ref)			ref	ref		ref	0.22 (0.12,0.33)***	ref	-0.08 (-0.18,0.02)	ref
Tx Program Type					0.22 (0.12,0.33)***		-1.23 (-1.35,-1.12) ref		-1.63 (-1.75,-1.51)*** ref	
Outpatient					-1.23 (-1.35,-1.11)***	24.61	-0.18 (-0.37,0.01)	24.61	-0.15 (-0.34,0.04)	-7.69
Detox					ref	-70.77	0.09 (0,0.18)*	-70.77	0.22 (0.13,0.31)***	-80.41
Rehab (ref)					-0.18 (-0.37,0.02)	ref		ref		ref
Enrolled in MAT					0.06 (-0.03,0.15)	-16.47	-0.25 (-0.67,0.18)	-16.47	-0.57 (-0.98,-0.16)*	-13.93
Psych Problems						6.18	-0.86 (-1.34,-0.37)**	9.42	-0.88 (-1.35,-0.41)**	24.61
Drug Use					-0.21 (-0.64,0.22)		-0.01 (-0.11,0.09)		-0.13 (-0.23,-0.04)*	
Heroin					-0.93 (-1.41,-0.44)**	-18.94	-0.66 (-1.07,-0.25)*	-22.12	-0.77 (-1.17,-0.37)**	-43.45
Non-rx Methadone					-0.02 (-0.12,0.08)	-60.54	-0.09 (-0.33,0.15)	-57.68	-0.31 (-0.54,-0.08)*	-58.52
Cocaine					-0.62 (-1.03,-0.2)*	-1.98	0.66 (0.23,1.1)*	-1.00	0.68 (0.26,1.1)*	-12.19
Synthetic Opioids					-0.14 (-0.38,0.1)	-46.21		-48.31		-53.70
Benzodiazepines					0.6 (0.17,1.04)*	-13.06		-8.61		-26.66
Any Opioids						82.21		93.48		97.39

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-0.36 (-0.47,-0.24)***	-30.23	-0.34 (-0.46,-0.23)***	-28.82		
1					-0.05 (-0.16,0.05)	-	-0.06 (-0.16,0.05) ref	-5.82		
2					4.88 ref	ref	-0.1 (-0.24,0.04)	ref		-40.55
3 (ref)					-0.08 (-0.22,0.06)	-7.69		-9.52		-17.30
IDU							0.48 (0.34,0.63)***			ref
Health Insurance Type							0.61 (0.42,0.79)***	61.61	-0.52 (-0.63,-0.41)***	0.00
Medicaid							0.4 (0.28,0.52)*** ref	84.04	-0.19 (-0.3,-0.09)** ref	
Medicare								49.18	0.002 (-0.13,0.13)	23.37
No Insurance							-0.35 (-0.54,-0.17)**	ref		113.83
Private Insurance (ref)							-0.42 (-0.59,-0.24)***		0.21 (0.06,0.36)*	43.33
Primary Income							-0.49 (-0.64,-0.34)***	-29.53	0.76 (0.58,0.94)***	ref
Public Assistance							-0.28 (-0.4,-0.16)***	-34.30	0.36 (0.24,0.48)*** ref	
Retirement/Pension							ref	-38.74		-42.88
Other Income Source								-24.42	-0.56 (-0.75,-0.38)***	-44.01
No Income								ref	-0.58 (-0.75,-0.41)***	-43.45
Salary (ref)									-0.57 (-0.72,-0.42)***	-31.61
State Level Variables									-0.38 (-0.5,-0.27)*** ref	ref
Per Capita Income										
Bupe Prog Rate									-0.0002 (-0.0002,-0.0002)***	-0.02
Rate of Indiv in Tx									0.16 (0.14,0.19)***	17.35
% of res w/Medicaid									-0.02 (-0.03,-0.02)***	-1.98
SABG									0.17 (0.16,0.19)***	18.53
									0.01 (0.01,0.01)***	1.01

Model 1: Unadjusted association between Medicaid coverage of buprenorphine and wait time for substance use treatment

Model 2: Medicaid coverage of buprenorphine and demographic covariates

Model 3: Medicaid coverage of buprenorphine, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 28.8: Model Building Summary Using Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Buprenorphine, 2008, N=320,656

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est

Bupe Covered	0.03 (0.003,0.05)*	3.04	0.04 (0.02,0.07)**	4.08	-0.13 (-0.15,-0.1)***	-12.19	-0.14 (-0.16,-0.11)***	-13.06	1.6 (1.54,1.66)***	395.30
Male			-0.06 (-0.09,-0.04)***	-5.82	-0.06 (-0.08,-0.04)***	-5.82	-0.06 (-0.08,-0.03)***	-5.82	-0.06 (-0.09,-0.04)***	-5.82
Race										
Black			0.001 (-0.03,0.03)	0.10	0.01 (-0.02,0.04)	1.01	-0.002 (-0.03,0.03)	-0.2	-0.15 (-0.18,-0.12)***	-13.93
Other Race			-0.58 (-0.62,-0.54)***	-44.01	0.2 (0.16,0.24)***	22.14	0.18 (0.14,0.22)***	19.72	0.21 (0.17,0.24)***	23.37
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			0.16 (0.13,0.2)***	17.35	-0.65 (-0.69,-0.61)***	-47.80	-0.66 (-0.7,-0.62)***	-48.31	-0.42 (-0.46,-0.39)***	-34.30
HS Education			-0.12 (-0.14,-0.09)***	-11.31	-0.1 (-0.12,-0.08)***	-9.52	-0.08 (-0.11,-0.06)***	-7.69	-0.06 (-0.08,-0.04)***	-5.82
Married			0.01 (-0.02,0.04)	1.01	0.01 (-0.04,0.01)	-1.00	0.01 (-0.02,0.03)	1.01	0.002(-0.02,0.03)	0.00
Employed			0.01 (-0.01,0.04)	1.01	-0.1 (-0.12,-0.07)***	-9.52	-0.22 (-0.25,-0.18)***	-19.75	-0.27 (-0.31,-0.24)***	-23.66
Unstably Housed			0.07 (0.05,0.1)***	7.25	0.12 (0.09,0.14)***	12.75	0.12 (0.09,0.14)***	12.75	-0.04 (-0.06,-0.02)*	-3.92
Age										
<18			0.24 (0.19,0.29)***	27.12	-0.01 (-0.06,0.04)	-1.00	-0.01 (-0.06,0.04)	-1.00	0.02 (-0.03,0.07)	2.02
18-24			0.32 (0.28,0.35)***	37.71	0.2 (0.16,0.23)***	22.14	0.19 (0.16,0.23)***	20.92	0.14 (0.11,0.17)***	15.03
25-34			0.26 (0.23,0.29)***	29.69	0.18 (0.15,0.21)***	19.72	0.16 (0.13,0.19)***	17.35	0.14 (0.11,0.17)***	15.03
35-44			0.15 (0.12,0.18)***	16.18	0.11 (0.08,0.14)***	11.63	0.1 (0.07,0.13)***	10.52	0.08 (0.05,0.11)***	8.33
>44 (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Tx Program Type										
Outpatient					0.1 (0.07,0.12)***	10.52	0.09 (0.06,0.12)***	9.42	-0.19 (-0.22,-0.16)***	-17.30
Detox					-1.27 (-1.31,-1.24)***	-71.92	-1.27 (-1.3,-1.24)***	-71.92	-1.64 (-1.67,-1.6)***	-80.60
Rehab (ref)					ref	ref	ref	ref	ref	ref
Enrolled in MAT					-0.29 (-0.35,-0.24)***	-25.17	-0.29 (-0.35,-0.24)***	-25.17	-0.23 (-0.28,-0.18)***	-20.55
Psych Problems					0.07 (0.05,0.1)***	7.25	0.1 (0.07,0.12)***	10.52	0.21 (0.18,0.23)***	23.37
Drug Use										
Heroin					-0.18 (-0.3,-0.06)*	-16.47	-0.12 (-0.24,0)*	-11.31	-0.28 (-0.4,-0.17)***	-24.42
Non-rx Methadone					-0.35 (-0.49,-0.21)***	-29.53	-0.34 (-0.47,-0.2)***	-28.82	-0.48 (-0.61,-0.35)***	-38.12
Cocaine					0.07 (0.05,0.1)***	7.25	0.07 (0.04,0.1)***	7.25	-0.08 (-0.11,-0.05)***	-7.69
Synthetic Opioids					-0.51 (-0.63,-0.4)***	-39.95	-0.46 (-0.58,-0.35)***	-36.87	-0.5 (-0.61,-0.39)***	-39.35
Benzodiazepines					0.04 (-0.03,0.11)	4.08	0.05 (-0.02,0.12)	5.13	-0.19 (-0.26,-0.13)***	-17.30
Any Opioids					0.55 (0.43,0.67)***	73.33	0.5 (0.38,0.62)***	64.87	0.37 (0.25,0.49)***	44.77

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-1.57 (-5.67,2.54)	-79.20	-1.53 (-5.63,2.56)	-78.35		
0					-0.2 (-0.23,-0.17)***	-18.13	-0.19 (-0.22,-0.16)***	-17.30		-89.14
1					0.03 (0.001,0.06)*		0.03 (0.004,0.07)***	3.05	-2.22 (-6.2,1.76)	-32.29
2					3.05 ref		ref	ref	-0.39 (-0.42,-0.35)***	-6.76
3 (ref)					ref		-0.03 (-0.07,0.01)	-2.96	-0.07 (-0.1,-0.04)***	ref
IDU					-0.02 (-0.06,0.02)	-1.98			ref	13.88
Health Insurance Type							0.48 (0.43,0.52)***	61.61	0.13 (0.09,0.17)***	
Medicaid							0.34 (0.29,0.39)***	40.49		28.40
Medicare							0.39 (0.35,0.42)***	47.70	0.25 (0.2,0.29)***	63.23
No Insurance							ref	ref	0.49 (0.44,0.54)***	47.70
Private Insurance (ref)									0.39 (0.36,0.42)***	ref
Primary Income							-0.31 (-0.36,-0.25)***	-26.66	ref	
Public Assistance							-0.2 (-0.25,-0.15)***	-18.13		-36.87
Retirement/Pension							-0.33 (-0.37,-0.29)***	-28.11	-0.46 (-0.51,-0.4)***	-28.11
Other Income Source							-0.24 (-0.27,-0.2)***	-21.34	-0.33 (-0.38,-0.28)***	-33.63
No Income							ref	ref	-0.41 (-0.45,-0.36)***	-31.61
Salary (ref)									-0.38 (-0.42,-0.35)*** ref	ref
State Level Variables										
Per Capita Income									-0.0002 (-0.0002,-0.0002)***	-0.2
Bupe Prog Rate									0.15 (0.14,0.16)***	16.18
Rate of Indiv in Tx									-0.02 (-0.02,-0.02)***	-1.98
% of res w/Medicaid									0.16 (0.15,0.16)***	17.35
SABG									0.01 (0.01,0.01)***	1.01

Model 1: Unadjusted association between Medicaid coverage of buprenorphine and wait time for substance use treatment

Model 2: Medicaid coverage of buprenorphine and demographic covariates

Model 3: Medicaid coverage of buprenorphine, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 28.9: Model Building Summary Using Multiple Imputation Sample for Treatment Wait Time and Medicaid Coverage of Buprenorphine, 2008, N=4,698,055

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est

Bupe Covered	0.44 (0.43,0.45)***	54.94	0.48 (0.47,0.49)***	61.61	0.36 (0.35,0.37)***	43.33	0.45 (0.44,0.46)***	56.83	0.35 (0.34,0.36)***	41.91
Male			-0.01 (-0.02,-0.01)**	-1.00	0.08 (0.07,0.08)***	8.33	0.002 (-0.004,0.01)	0.20	0.01 (0.01,0.02)***	1.01
Race										
Black			-0.11 (-0.11,-0.1)***	-10.42	-0.07 (-0.08,-0.06)***	-6.76	-0.11 (-0.12,-0.11)***	-10.42	-0.14 (-0.15,-0.13)***	-13.06
Other Race			-0.3 (-0.31,-0.29)***	-25.92	-0.27 (-0.28,-0.27)***	-23.66	-0.23 (-0.24,-0.23)***	-20.55	-0.12 (-0.13,-0.12)*** ref	-11.31
White (ref)			ref	ref	ref	ref	ref	ref	-0.17 (-0.18,-0.17)***	ref
Hispanic			-0.4 (-0.4,-0.39)***	-32.97	-0.26 (-0.27,-0.25)***	-22.89	-0.26 (-0.27,-0.26)***	-22.89	-0.01 (-0.02,-0.003)*	-15.63
HS Education Married			-0.05 (-0.06,-0.04)***	-4.88	-0.04 (-0.05,-0.04)***	-3.92	-0.01 (-0.02,-0.01)***	-1.00	0.07 (0.07,0.08)***	-1.00
Employed			0.05 (0.04,0.05)***	5.13	0.01 (0.001,0.02)*	1.01	0.07 (0.06,0.07)***	7.25	0.03 (0.02,0.04)***	7.25
Unstably Housed			-0.002 (-0.01,0.005)	-0.20	0.02 (0.02,0.03)***	2.02	0.01 (0.003,0.02)*	1.01	-0.04 (-0.04,-0.03)***	3.05
Age			-0.15 (-0.15,-0.14)***	-13.93	-0.13 (-0.13,-0.12)***	-12.19	-0.13 (-0.14,-0.12)***	-12.19		-3.92
<18									0.33 (0.31,0.34)***	
18-24			0.69 (0.67,0.7)***	99.37	0.27 (0.26,0.28)***	31.00	0.47 (0.46,0.49)***	60.00	0.15 (0.14,0.16)***	39.10
25-34			0.3 (0.29,0.3)***	34.99	0.2 (0.19,0.21)***	22.14	0.21 (0.2,0.22)***	23.37	0.07 (0.07,0.08)***	16.18
35-44			0.21 (0.2,0.22)***	23.37	0.14 (0.13,0.15)***	15.03	0.12 (0.11,0.13)***	12.75	0.02 (0.01,0.03)*** ref	7.25
>44 (ref)			0.09 (0.09,0.1)***	9.42	0.05 (0.04,0.05)***	5.13	0.04 (0.03,0.05)***	4.08		2.02
Tx Program Type			ref	ref	ref	ref	ref	ref	-0.34 (-0.35,-0.34)***	ref
Outpatient									-0.88 (-0.89,-0.87)*** ref	
Detox					-0.2 (-0.21,-0.2)***	-18.13	-0.27 (-0.28,-0.26)***	-23.66	-0.47 (-0.48,-0.46)***	-28.82
Rehab (ref)					-0.67 (-0.67,-0.66)***	-48.83	-0.75 (-0.76,-0.74)***	-52.76	0.62 (0.61,0.63)***	-58.52
Enrolled in MAT					ref	ref	ref	ref		ref
Psych Problems					-0.54 (-0.55,-0.53)***	-41.73	-0.54 (-0.55,-0.53)***	-41.73	-0.04 (-0.06,-0.01)*	-37.50
Drug Use					0.83 (0.82,0.83)***	129.33	0.65 (0.65,0.66)***	91.55	-0.02 (-0.05,0.02)	85.89
Heroin									-0.04 (-0.04,-0.03)***	
Non-rx Methadone					0.03 (0.005,0.06)*	3.05	-0.002 (-0.03,0.03)	-0.20	-0.04 (-0.07,-0.02)**	-3.92
Cocaine					0 (-0.03,0.04)	0.00	-0.03 (-0.06,0.003)	-2.96	0.01 (-0.01,0.03)	-1.98
Synthetic Opioids					0.04 (0.03,0.05)***	4.08	-0.001 (-0.01,0.01)	-0.10	0.05 (0.02,0.07)**	-3.92
Benzodiazepines					0.05 (-0.07,-0.02)**	-4.88	-0.04 (-0.06,-0.01)*	-3.92		-3.92
Any Opioids					0.02 (-0.001,0.04)	2.02	0.03 (0.01,0.05)*	3.05		1.01
					0.05 (0.02,0.07)*	5.13	0.05 (0.02,0.08)**	5.13		5.13

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-0.04 (-0.05,-0.03)***	-3.92	-0.03 (-0.04,-0.02)***	-2.96		
1					-0.11 (-0.12,-0.1)***	-	-0.06 (-0.07,-0.05)***	-5.82		-1.00
2					10.42 ref	ref	ref	ref		-1.98
3 (ref)					-0.18 (-0.19,-0.17)***	-16.47	-0.17 (-0.18,-0.16)***	-15.63		ref
IDU									-0.01 (-0.02,-0.001)*	-12.19
Health Insurance Type							0.44 (0.43,0.45)***	55.27	-0.02 (-0.03,-0.01)** ref	
Medicaid							0.87 (0.86,0.89)***	138.69	-0.13 (-0.14,-0.12)***	78.60
Medicare							0.92 (0.91,0.93)***	150.93		107.51
No Insurance							ref	ref	0.58 (0.57,0.6)***	148.43
Private Insurance (ref)									0.73 (0.71,0.74)***	ref
Primary Income							-0.06 (-0.07,-0.04)***	-5.82	0.91 (0.91,0.92)*** ref	
Public Assistance							0.09 (0.07,0.1)***	9.42		-5.82
Retirement/Pension							-0.13 (-0.14,-0.12)***	-12.19	-0.06 (-0.07,-0.04)***	1.01
Other Income Source							-0.18 (-0.19,-0.17)***	-16.47	0.01 (-0.01,0.02)	-16.47
No Income							ref	ref	-0.18 (-0.2,-0.17)***	-12.19
Salary (ref)									-0.13 (-0.14,-0.12)*** ref	ref
State Level Variables										
Per Capita Income									-0.0001 (-0.0001,-0.0001)***	-0.01
Bupe Prog Rate									-0.08 (-0.08,-0.08)***	-7.69
Rate of Indiv in Tx									0.04 (0.03,0.04)***	4.08
% of res w/Medicaid									-0.06 (-0.06,-0.06)***	-5.82
SABG									0.002 (0.002,0.002)***	0.20

Model 1: Unadjusted association between Medicaid coverage of buprenorphine and wait time for substance use treatment

Model 2: Medicaid coverage of buprenorphine and demographic covariates

Model 3: Medicaid coverage of buprenorphine, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2B.10: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Buprenorphine, 2006, N=24,100

	Model 1 Estimate (95% CI)	% Diff Est	Model 2 Estimate (95% CI)	% Diff Est	Model 3 Estimate (95% CI)	% Diff Est	Model 4 Estimate (95% CI)	% Diff Est	Model 5 Estimate (95% CI)	% Diff Est

Bupe Covered	1.13 (1.05,1.21)***	209.57	1.2 (1.12,1.28)***	232.01	1.13 (1.04,1.21)*** -	209.57	1.14 (1.05,1.23)***	212.68	2.23 (2.09,2.36)***	829.99
Male			-0.1 (-0.19,-0.01)*	-9.52	0.08 (-0.16,0.01)	-7.69	-0.06 (-0.15,0.02)	-5.82	-0.07 (-0.15,0.02)	-6.76
Race										
Black			-0.28 (-0.38,-0.18)***	-24.42	-0.2 (-0.31,-0.09)**	-18.13	-0.23 (-0.34,-0.12)***	-20.55	-0.35 (-0.45,-0.24)***	-29.53
Other Race			-0.72 (-0.86,-0.57)*	-51.32	0.12 (-0.04,0.28) ref	12.75	0.12 (-0.03,0.28) ref	12.75	-0.24 (-0.39,-0.09)* ref	-21.34
White (ref)			ref	ref	-0.72 (-0.87,-0.58)***	ref	-0.75 (-0.9,-0.61)***	ref	-0.13 (-0.27,0.01)	ref
Hispanic			0.18 (0.02,0.34)***	19.72	-0.03 (-0.12,0.06)	-51.32	-0.01 (-0.09,0.08)	-52.76	0.02 (-0.07,0.11)	-12.19
HS Education Married			-0.03 (-0.12,0.06)	-2.96	0.15 (0.06,0.25)*	-2.96	0.2 (0.1,0.3)***	-1.00	0.15 (0.06,0.25)*	2.02
Employed			0.21 (0.11,0.31)*** -	23.37 -	-0.16 (-0.25,-0.07)**	16.18	-0.17 (-0.3,-0.04)*	22.14	-0.22 (-0.34,-0.09)**	16.18
Unstably Housed			0.07 (-0.15,0.02)	6.76	-0.03 (-0.11,0.06)	-14.79	-0.03 (-0.12,0.05)	-15.63	0.004 (-0.08,0.09)	-19.75
Age			-0.05 (-0.13,0.04)	-4.88		-2.96		-2.96		0.36
<18					0.16 (-0.03,0.34)		0.17 (-0.04,0.37)		-0.05 (-0.25,0.14)	
18-24			0.51 (0.33,0.69)***	66.53	0.21 (0.07,0.34)*	17.35	0.21 (0.07,0.34)*	18.53	0.11 (-0.02,0.25)	-4.88
25-34			0.38 (0.25,0.52)***	46.23	0.12 (0,0.24)*	23.37	0.08 (-0.04,0.21)	23.37	0.09 (-0.03,0.21)	11.63
35-44			0.23 (0.11,0.35)**	25.86	0.19 (0.08,0.31)**	12.75	0.16 (0.05,0.28)* ref	8.33	0.17 (0.06,0.29)* ref	9.42
>44 (ref)			0.18 (0.07,0.3)* ref	19.72	ref	20.92		17.35		18.53
Tx Program Type				ref		ref	-0.22 (-0.34,-0.11)***	ref	-0.65 (-0.77,-0.53)***	ref
Outpatient					-0.23 (-0.34,-0.12)***		-1.53 (-1.65,-1.4)***		-2.38 (-2.52,-2.25)*** ref	
Detox					-1.52 (-1.64,-1.39)***	-20.55	ref	-19.75	0.42 (0.21,0.63)**	-47.80
Rehab (ref)					ref	-78.13	0.7 (0.49,0.92)***	-78.35	0.09 (-0.01,0.18)	-90.74
Enrolled in MAT					0.76 (0.54,0.97)***	ref	0.11 (0.01,0.21)*	ref		ref
Psych Problems					0.11 (0.01,0.21)*	113.83		101.38	-0.77 (-1.24,-0.31)*	52.20
Drug Use						11.63	-1.35 (-1.84,-0.87)***	11.63	0.37 (-0.11,0.86)	9.42
Heroin					-1.54 (-2.02,-1.05)***		-0.03 (-0.53,0.46)		-0.23 (-0.33,-0.13)***	
Non-rx Methadone					-0.02 (-0.51,0.48)	-78.56	-0.2 (-0.3,-0.1)***	-74.08	-0.77 (-1.22,-0.32)**	-53.70
Cocaine					-0.22 (-0.32,-0.12)***	-1.98	-0.88 (-1.35,-0.41)**	-2.96	0.25 (-0.02,0.53)	44.77
Synthetic Opioids					-1.04 (-1.5,-0.57)***	-19.75	0.21 (-0.07,0.49)	-18.13	0.39 (-0.09,0.87)	-20.55
Benzodiazepines					0.1 (-0.18,0.38)	-64.65	0.69 (0.2,1.19)*	-58.52		-53.70
Any Opioids					0.85 (0.36,1.35)**	10.52		23.37		28.40
						133.96		99.37		47.70

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-0.56 (-0.68,-0.43)***	-42.88	-0.53 (-0.65,-0.41)***	-41.14		
1					-0.17 (-0.29,-0.05)*	-	-0.14 (-0.26,-0.02)*	-13.06		-34.30
2					15.63 ref		ref	ref		-11.31
3 (ref)					ref		0.19 (0.04,0.34)*	20.92		ref
IDU					0.23 (0.08,0.37)*	25.86			-0.42 (-0.54,-0.29)***	12.75
Health Insurance Type							0.54 (0.38,0.7)***	71.60	-0.12 (-0.24,-0.01)* ref	
Medicaid							0.64 (0.43,0.86)***	89.65	0.12 (-0.03,0.26)	16.18
Medicare							0.43 (0.31,0.55)***	53.73		80.40
No Insurance							ref	ref	0.15 (-0.01,0.3)	31.00
Private Insurance (ref)									0.59 (0.38,0.8)***	ref
Primary Income							-0.2 (-0.4,0)*	-18.13	0.27 (0.15,0.39)*** ref	
Public Assistance							-0.14 (-0.33,0.05)	-13.06		-21.34
Retirement/Pension							-0.23 (-0.39,-0.07)*	-20.55	-0.24 (-0.43,-0.05)*	-22.89
Other Income Source							-0.03 (-0.16,0.11) ref	-2.96	-0.26 (-0.44,-0.09)*	-8.61
No Income								ref	-0.09 (-0.25,0.07)	-28.11
Salary (ref)									-0.33 (-0.46,-0.2)*** ref	ref
State Level Variables										
Per Capita Income									-0.0002 (-0.0002,-0.0002)***	-0.02
Bupe Prog Rate									-0.1 (-0.12,-0.07)***	-9.52
Rate of Indiv in Tx									0.03 (0.03,0.04)***	3.05
% of res w/Medicaid									0.04 (0.03,0.06)***	4.08
SABG									0.0009 (-0.001,0.003)	0.09

Model 1: Unadjusted association between Medicaid coverage of buprenorphine and wait time for substance use treatment

Model 2: Medicaid coverage of buprenorphine and demographic covariates

Model 3: Medicaid coverage of buprenorphine, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2B.11: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Treatment Wait Time and Medicaid Coverage of Buprenorphine, 2006, N=240,757

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est

Bupe Covered	1.14 (1.11,1.17)***	212.68	1.19 (1.17,1.22)***	228.71	1.08 (1.05,1.11)***	194.47	1.09 (1.07,1.12)***	197.43	2.2 (2.16,2.24)***	802.50
Male			-0.1 (-0.13,-0.07)***	-9.52	-0.09 (-0.12,-0.06)***	-8.61	-0.08 (-0.11,-0.05)***	-7.69	-0.07 (-0.1,-0.05)***	-6.76
Race										
Black			-0.22 (-0.25,-0.19)***	-19.75	-0.17 (-0.2,-0.13)***	-15.63	-0.18 (-0.22,-0.15)	-16.47	-0.26 (-0.3,-0.23)***	-22.89
Other Race			-0.63 (-0.67,-0.59)*	-46.74	0.002 (-0.05,0.05)	0.00	-0.03 (-0.08,0.02)***	-2.96	-0.34 (-0.38,-0.29)*** ref	-28.82
White (ref)			ref	ref	ref	ref	ref	ref	-0.16 (-0.21,-0.12)***	ref
Hispanic			0.05 (0,0.1)***	5.13	-0.7 (-0.74,-0.65)***	-50.34	-0.7 (-0.75,-0.66)***	-50.34	0.05 (0.02,0.08)**	-14.79
HS Education Married			-0.03 (-0.06,0)*	-2.96	-0.04 (-0.07,-0.01)*	-3.92	-0.01 (-0.04,0.02)	-1.00	0.08 (0.05,0.11)***	5.13
Employed			0.08 (0.05,0.11)***	8.33	0.07 (0.04,0.1)***	7.25	0.1 (0.07,0.13)***	10.52	-0.11 (-0.15,-0.07)***	8.33
Unstably Housed			-0.02 (-0.05,0.01)	-1.98	-0.13 (-0.16,-0.1)***	-12.19	-0.11 (-0.16,-0.07)***	-10.42	0.01 (-0.01,0.04)	-10.42
Age			-0.05 (-0.08,-0.03)**	-4.88	-0.03 (-0.06,-0.01)***	-2.96	-0.05 (-0.08,-0.02)**	-4.88		1.01
<18									0.1 (0.04,0.16)*	
18-24			0.54 (0.48,0.6)***	71.60	0.25 (0.19,0.31)***	28.40	0.28 (0.22,0.34)***	32.31	0.21 (0.17,0.25)***	10.52
25-34			0.4 (0.36,0.44)***	49.18	0.25 (0.21,0.29)***	28.40	0.24 (0.2,0.28)***	27.12	0.16 (0.12,0.19)***	23.37
35-44			0.32 (0.28,0.36)***	37.71	0.23 (0.2,0.27)***	25.86	0.2 (0.16,0.24)***	22.14	0.11 (0.08,0.15)*** ref	17.35
>44 (ref)			0.13 (0.1,0.17)***	13.88	0.12 (0.09,0.16)***	12.75	0.1 (0.06,0.13)***	10.52		11.63
Tx Program Type			ref	ref	ref	ref	ref	ref	-0.59 (-0.63,-0.55)***	ref
Outpatient									-2.34 (-2.38,-2.3)*** ref	
Detox					-0.17 (-0.2,-0.13)***	-15.63	-0.17 (-0.21,-0.14)***	-15.63	0.32 (0.26,0.39)***	-44.57
Rehab (ref)					-1.51 (-1.55,-1.47)***	-77.91	-1.52 (-1.56,-1.48)***	-78.13	0.1 (0.07,0.14)***	-90.37
Enrolled in MAT					ref	ref	ref	ref		ref
Psych Problems					0.52 (0.46,0.59)***	68.20	0.5 (0.43,0.56)***	64.87	-0.41 (-0.56,-0.27)***	37.71
Drug Use					0.04 (0.01,0.07)*	4.08	0.05 (0.02,0.08)*	5.13	-0.25 (-0.41,-0.09)*	10.52
Heroin									-0.12 (-0.15,-0.08)***	
Non-rx Methadone					-0.96 (-1.11,-0.81)***	-61.71	-0.94 (-1.09,-0.79)***	-60.94	-0.23 (-0.37,-0.1)**	-33.63
Cocaine					-0.6 (-0.77,-0.44)***	-45.12	-0.6 (-0.77,-0.43)***	-45.12	-0.003 (-0.09,0.09)	-22.12
Synthetic Opioids					-0.14 (-0.17,-0.11)***	-13.06	-0.15 (-0.18,-0.12)***	-13.93	0.05 (-0.1,0.19)	-11.31
Benzodiazepines					-0.46 (-0.6,-0.31)***	-36.87	-0.44 (-0.58,-0.29)***	-35.60		-20.55
Any Opioids					0.06 (-0.03,0.16)	6.18	0.14 (0.04,0.23)**	15.03		-0.30
					0.42 (0.27,0.57)***	52.20	0.41 (0.26,0.56)***	50.68		5.13

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-0.43 (-0.47,-0.39)***	-34.95	-0.42 (-0.46,-0.38)***	-34.30		
1					-0.09 (-0.13,-0.05)***	-	-0.09 (-0.13,-0.05)***	-8.61		-25.92
2					8.61 ref		ref	ref		-3.92
3 (ref)					ref		0.19 (0.14,0.24)***	20.92		ref
IDU					0.21 (0.16,0.25)***	23.37			-0.3 (-0.34,-0.26)***	19.72
Health Insurance Type							0.66 (0.61,0.71)***	93.48	-0.04 (-0.08,-0.01)* ref	
Medicaid							0.76 (0.7,0.83)***	113.83	0.18 (0.13,0.23)***	32.31
Medicare							0.52 (0.48,0.56)***	68.20		93.48
No Insurance							ref	ref	0.28 (0.23,0.33)***	29.69
Private Insurance (ref)									0.66 (0.59,0.73)***	ref
Primary Income							-0.23 (-0.29,-0.17)***	-20.55	0.26 (0.22,0.3)*** ref	
Public Assistance							-0.13 (-0.19,-0.07)***	-12.19		-19.75
Retirement/Pension							-0.13 (-0.19,-0.08)***	-12.19	-0.22 (-0.28,-0.16)*** -0.2	-18.13
Other Income Source							-0.05 (-0.09,-0.01)*	-4.88	(-0.26,-0.15)***	-4.88
No Income							ref	ref	-0.05 (-0.1,0)*	-22.89
Salary (ref)									-0.26 (-0.3,-0.22)*** ref	ref
State Level Variables										
Per Capita Income									-0.0002 (-0.0002,-0.0001)***	-0.20
Bupe Prog Rate									-0.11 (-0.12,-0.1)***	-10.42
Rate of Indiv in Tx									0.03 (0.03,0.03)***	3.05
% of res w/Medicaid									0.04 (0.04,0.05)***	4.08
SABG									-0.002 (-0.002,-0.001)***	-0.02

Model 1: Unadjusted association between Medicaid coverage of buprenorphine and wait time for substance use treatment

Model 2: Medicaid coverage of buprenorphine and demographic covariates

Model 3: Medicaid coverage of buprenorphine, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates and health insurance and income covariates

Model 5: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Table 2B.12: Model Building Summary Using Multiple Imputation Sample for Treatment Wait Time and Medicaid Coverage of Buprenorphine, 2006, N=4,258,996

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est

Bupe Covered	0.68 (0.67,0.68)***	97.39	0.7 (0.69,0.7)***	101.38	0.56 (0.56,0.57)***	75.07	0.58 (0.57,0.59)***	78.60	0.97 (0.96,0.98)***	163.79
Male			0.02 (0.02,0.03)***	2.02	0.08 (0.07,0.08)***	8.33	0.05 (0.05,0.06)***	5.13	0.02 (0.01,0.02)***	2.02
Race										
Black			-0.14 (-0.15,-0.14)***	-13.06	-0.11 (-0.11,-0.1)***	-10.42	-0.14 (-0.14,-0.13)***	-13.06	-0.1 (-0.11,-0.09)***	-9.52
Other Race			-0.26 (-0.27,-0.25)***	-22.89	-0.09 (-0.1,-0.08)***	-8.61	-0.11 (-0.12,-0.1)***	-10.42	0.04 (0.03,0.05)*** ref	4.08
White (ref)			ref	ref	ref	ref	ref	ref	-0.21 (-0.22,-0.2)***	ref
Hispanic			-0.25 (-0.26,-0.24)***	-22.12	-0.31 (-0.32,-0.31)***	-26.66	-0.33 (-0.34,-0.32)***	-28.11	0.03 (0.02,0.04)***	-18.94
HS Education			0.001 (-0.01,0.01)	0.00	0.005 (-0.002,0.01)	0.50	0.02 (0.02,0.03)***	2.02	0.03 (0.03,0.04)***	3.05
Married			-0.02 (-0.02,-0.01)***	-1.98	-0.03 (-0.04,-0.02)***	-2.96	0.01 (0,0.02)*	1.01	0.13 (0.12,0.14)***	3.05
Employed			-0.01 (-0.01,-0.0002)*	-1.00	0.04 (0.03,0.04)***	4.08	0.08 (0.07,0.09)***	8.33	0.02 (0.01,0.02)***	13.88
Unstably Housed			0.03 (0.02,0.04)***	3.05	-0.02 (-0.03,-0.01)***	-1.98	-0.04 (-0.05,-0.03)***	-3.92		2.02
Age									0.25 (0.23,0.26)***	
<18			0.59 (0.58,0.61)***	80.40	0.28 (0.27,0.29)***	32.31	0.39 (0.38,0.4)***	47.70	0.09 (0.08,0.1)***	28.40
18-24			0.23 (0.22,0.24)***	25.86	0.14 (0.13,0.15)***	15.03	0.15 (0.14,0.16)***	16.18	0.05 (0.04,0.06)***	9.42
25-34			0.19 (0.18,0.2)***	20.92	0.11 (0.1,0.12)***	11.63	0.09 (0.09,0.1)***	9.42	0.02 (0.01,0.03)*** ref	5.13
35-44			0.09 (0.08,0.1)***	9.42	0.05 (0.04,0.05)***	5.13	0.04 (0.03,0.05)***	4.08		2.02
>44 (ref)			ref	ref	ref	ref	ref	ref	-0.51 (-0.52,-0.5)***	ref
Tx Program Type									-0.81 (-0.82,-0.8)***	
Outpatient					-0.39 (-0.4,-0.38)***	-32.29	-0.4 (-0.41,-0.39)***	-32.97	ref	-39.95
Detox					-0.69 (-0.7,-0.68)***	-49.84	-0.7 (-0.71,-0.69)***	-50.34	-0.06 (-0.08,-0.05)***	-55.51
Rehab (ref)					ref	ref	ref	ref	0.37 (0.36,0.37)***	ref
Enrolled in MAT					-0.16 (-0.17,-0.15)***	-14.79	-0.16 (-0.18,-0.15)***	-14.79		-5.82
Psych Problems					0.58 (0.57,0.58)***	78.60	0.53 (0.52,0.54)***	69.89	-0.29 (-0.32,-0.26)***	44.77
Drug Use									-0.24 (-0.28,-0.2)***	
Heroin					-0.19 (-0.23,-0.16)***	-17.30	-0.2 (-0.23,-0.16)***	-18.13	-0.11 (-0.12,-0.1)***	-25.17
Non-rx Methadone					-0.28 (-0.32,-0.25)***	-24.42	-0.28 (-0.32,-0.25)***	-24.42	-0.25 (-0.28,-0.22)***	-21.34
Cocaine					-0.04 (-0.05,-0.03)***	-3.92	-0.05 (-0.06,-0.05)***	-4.88	0.19 (0.17,0.21)***	-10.42
Synthetic Opioids					-0.31 (-0.34,-0.28)***	-26.66	-0.29 (-0.32,-0.26)***	-25.17	0.11 (0.08,0.14)***	-22.12
Benzodiazepines					0.17 (0.15,0.2)***	18.53	0.19 (0.17,0.22)***	20.92		20.92
Any Opioids					0.1 (0.07,0.14)***	10.52	0.1 (0.07,0.14)***	10.52		11.63
	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est	Estimate (95% CI)	% Diff Est
Ttl # of Drugs Used					-0.23 (-0.24,-0.21)***	-20.55	-0.22 (-0.23,-0.21)***	-19.75		
1					-0.23 (-0.24,-0.22)***	-	-0.22 (-0.23,-0.21)***	-19.75		-16.47
2					20.55 ref		ref	ref	-0.18 (-0.19,-0.17)***	-9.52
3 (ref)					ref		-0.13 (-0.14,-0.12)***	-12.19	-0.1 (-0.11,-0.09)***	ref
IDU					-0.11 (-0.12,-0.1)***	-10.42			ref	1.01
Health Insurance Type							0.37 (0.36,0.38)***	44.77	0.01 (0,0.02)*	
Medicaid							0.7 (0.69,0.72)***	101.38		53.73
Medicare							0.5 (0.5,0.51)***	64.87	0.43 (0.42,0.45)***	34.99
No Insurance							ref	ref	0.3 (0.29,0.31)***	58.41
Private Insurance (ref)									0.46 (0.45,0.47)*** ref	ref
Primary Income							-0.003 (-0.02,0.01)	-0.30		
Public Assistance							0.04 (0.02,0.05)***	4.08	-0.09 (-0.1,-0.07)***	-8.61
Retirement/Pension							-0.08 (-0.09,-0.07)***	-7.69	0.01 (-0.01,0.02)	1.01
Other Income Source							-0.01 (-0.02,-0.002)***	-1.00	-0.09 (-0.1,-0.08)***	-8.61
No Income							ref	ref	0.11 (0.1,0.12)***	11.63
Salary (ref)									ref	ref
State Level Variables										
Per Capita Income									-0.0001 (-0.0001,-0.0001)***	-0.01
Bupe Prog Rate									-0.1 (-0.1,-0.1)***	-9.52
Rate of Indiv in Tx									-0.003 (-0.003,-0.002)***	-0.30
% of res w/Medicaid									-0.04 (-0.04,-0.04)***	-3.92
SABG									-0.002 (-0.002,-0.002)***	-0.20

Model 1: Unadjusted association between Medicaid coverage of buprenorphine and wait time for substance use treatment

Model 2: Medicaid coverage of buprenorphine and demographic covariates

Model 3: Medicaid coverage of buprenorphine, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates and health insurance and income covariates

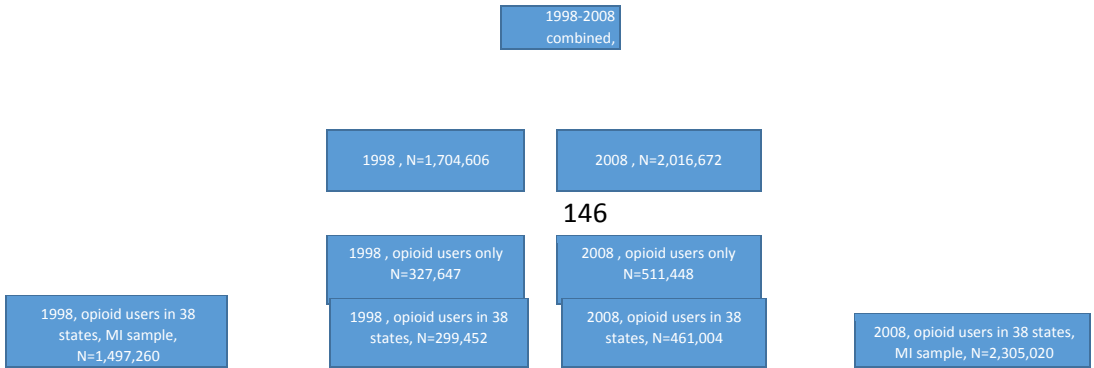
Model 5: Medicaid coverage of buprenorphine, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level variables

***=p<0.0001

**=p<0.001

*=p<0.05

Figure 3.1: Analytic Sample for Aim 3, Utilization of MAT and Medicaid Coverage of Methadone



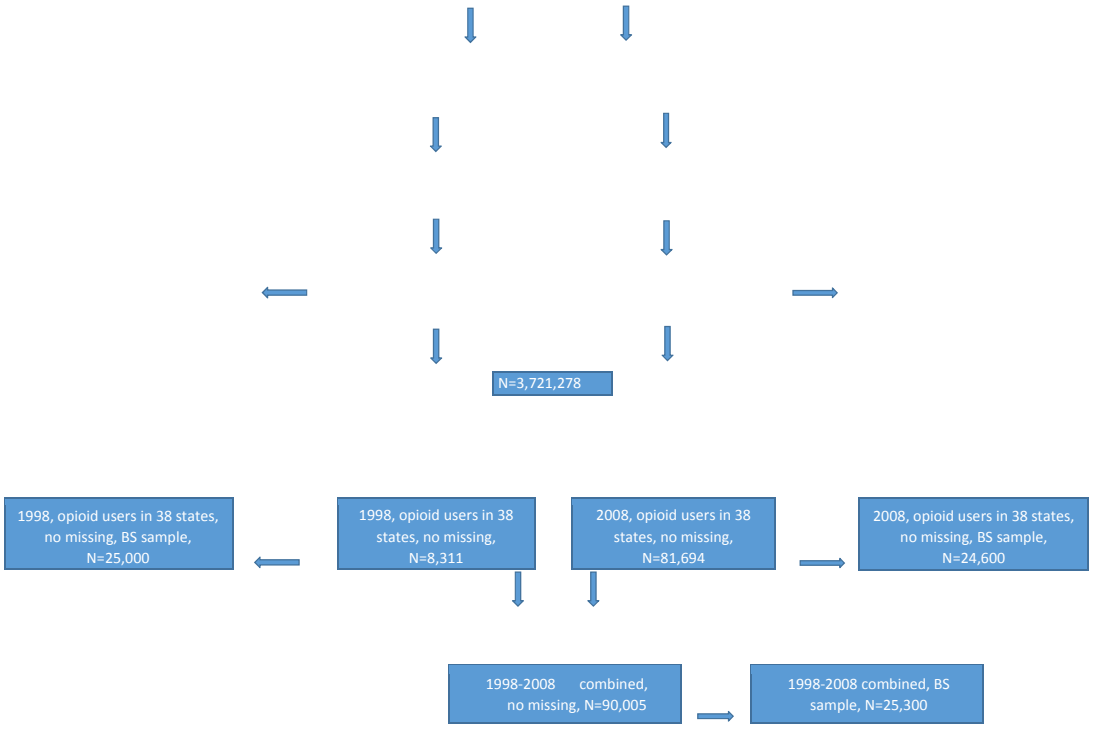

N=3,721,278
1998, opioid users in 38 states, no missing, BS sample, N=25,000
1998, opioid users in 38 states, no missing, N=8,311
2008, opioid users in 38 states, no missing, N=81,694
2008, opioid users in 38 states, no missing, BS sample, N=24,600
1998-2008 combined, no missing, N=90,005
1998-2008 combined, BS sample, N=25,300

Table 3.1 Comparison of Characteristics of Cases with Missing Data on Any Variables Compared to Cases with No Missing Data, Utilization of MAT and Medicaid Coverage of Methadone, 2008

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
	N=378828	N=81584
	n (%)	n (%)
Medicaid Coverage of Methadone***	367225 (97%)	69986 (86%)
missing	n=0	n=0
Male***	244451 (65%)	48852 (60%)
missing	n=62	n=0
Race		
White***	263753 (71%)	53958 (66%)
Black***	53366 (14%)	22521 (28%)
Other Race***	54961 (15%)	5105 (6%)
missing	n=6748	n=0
Hispanic***	61206 (17%)	5544 (7%)
missing	n=12087	n=0
HS Education	251892 (67%)	54849 (67%)
missing	n=4272	n=0
Married	53888 (20%)	15920 (20%)
missing	n=106634	n=0
Employed	69389 (19%)	15205 (19%)
missing	n=6057	n=0
Unstably housed***	105404 (30%)	33116 (41%)
missing	n=33060	n=0
Age		
<24***	84384 (22%)	17409 (21%)
25-34***	117639 (31%)	24730 (30%)
35-44***	90639 (24%)	20967 (26%)
≥45	86166 (23%)	18478 (23%)
missing	n=0	n=0
Program Type		
Rehab	73860 (20%)	15677 (19%)
Non-Rehab Outpatient/Detox	304877 (81%)	65907 (81%)
missing	n=91	n=0
Patient receiving MAT***	83094 (22%)	15360 (19%)
missing	n=2693	n=0
Psych Problems***	79806 (32%)	22614 (28%)
missing	n=133120	n=0

Drug use reported at admit		
Heroin***	259003 (68%)	57719 (71%)
missing	n=0	n=0
Non prescription Methadone***	11268 (3%)	1917 (2%)
missing	n=0	n=0
Synthetic opioids***	142610 (38%)	27424 (34%)
missing	n=0	n=0
Cocaine/Crack***	120412 (32%)	27939 (34%)
missing	n=0	n=0

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
Benzodiazepine***	28724 (8%)	6569 (8%)
missing	n=0	n=0
# of subs reported at admit		
1***	106509 (28%)	25642 (31%)
2***	133427 (35%)	27121 (33%)
3***	138892 (37%)	28821 (35%)
missing	n=0	n=0
IDU***	175659 (46%)	344448 (42%)
missing	n=0	n=0
Client Insurance Type		
Medicaid***	31961 (24%)	25225 (31%)
Medicare***	18147 (14%)	6210 (8%)
No insurance	70196 (53%)	42969 (53%)
Private Insurance**	12161 (9%)	7180 (9%)
missing	n=201085	n=0
Primary Source of Income		
Public Assistance***	21449 (10%)	6384 (8%)
Retirement/Pension***	8943 (4%)	10069 (12%)
Other Income***	52081 (24%)	10155 (12%)
No income***	94022 (43%)	35891 (44%)
Salary***	41892 (19%)	19085 (23%)
missing	n=113201	n=0
Continuous variables		
Rate of methadone programs/10K pop*	6.01 (3.08)	6.16 (3.19)
Rate of individuals in tx/1M pop***	36.09 (21.02)	37.97 (25.0)

Percent of residents rec'v Medicaid***	21.53 (5.48)	19.89 (4.42)

***=p<0.0001

**=p<0.001

*=p<0.05

Table 3.2 Comparison of Characteristics of Cases with Missing Data on Any Variables Compared to Cases with No Missing Data, Utilization of MAT and Medicaid Coverage of Methadone, 1998

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
	N=291141	N=8311
	n (%)	n (%)
Medicaid Coverage of Methadone***	270503 (93%)	6417 (77%)
missing	n=0	n=0
Male***	193509 (67%)	5062 (61%)
missing	n=235	n=0
Race		
White***	152899 (53%)	5739 (69%)
Black**	71073 (25%)	1911 (23%)
Other Race***	65235 (23%)	661 (8%)
missing	n=1934	n=0
Hispanic***	67199 (23%)	781 (9%)
missing	n=3077	n=0
HS Education***	179228 (62%)	5750 (69%)
missing	n=1879	n=0
Married*	44319 (25%)	2158 (26%)
missing	n=111391	n=0
Employed***	60065 (21%)	2725 (33%)
missing	n=5122	n=0
Unstably housed***	59681 (31%)	3439 (41%)
missing	n=95744	n=0
Age		
<24***	37365 (13%)	1298 (16%%)
25-34**	91907 (32%)	2475 (30%)
35-44	110603 (38%)	3241 (39%)
≥45***	51266 (18%)	1297 (16%)
missing	n=0	n=0
Program Type* **		
Rehab	43247 (15%)	1754 (21%)
Non-Rehab Outpatient/Detox	247806 (85%)	6557 (79%)
missing	n=88	n=0

Patient receiving MAT***	91660 (32%)	2085 (25%)
missing	n=606	n=0
Psych Problems***	28858 (14%)	1962 (24%)
missing	n=87644	n=0
Drug use reported at admit		
Heroin***	267149 (92%)	6242 (75%)
missing	n=0	n=0
Non prescription Methadone**	5375 (2%)	195 (2%)
missing	n=0	n=0
Synthetic opioids***	29552 (10%)	2466 (30%)
missing	n=0	n=0
Cocaine/Crack***	113053 (39%)	3501 (42%)
missing	n=0	n=0

	Missing Data on Any Predictor Variable	No Missing Data on Any Predictor Variable
Benzodiazepine***	8609 (3%)	398 (5%)
missing	n=0	n=0
# of subs reported at admit		
1***	96160 (33%)	1872 (23%)
2	97206 (33%)	2793 (34%)
3***	97775 (34%)	3646 (44%)
missing	n=0	n=0
IDU	154895 (53%)	4335 (52%)
missing	n=0	n=0
Client Insurance Type		
Medicaid***	24913 (18%)	1239 (15%)
Medicare***	13780 (10%)	730 (9%)
No insurance**	82278 (61%)	5225 (63%)
Private Insurance***	13997 (10%)	1117 (13%)
missing	n=201085	n=0
Primary Source of Income		
Public Assistance***	25144 (23%)	775 (9%)
Retirement/Pension***	3557 (3%)	845 (10%)
Other Income***	30459 (27%)	1308 (16%)
No income*	29250 (26%)	2306 (28%)
Salary***	22534 (20%)	3077 (37%)
missing	n=180197	n=0

Continuous variables		
Rate of methadone programs/10K pop*	5.33 (2.85)	3.37 (2.59)
Rate of individuals in tx/1M pop***	29.84 (17.04)	12.82 (14.89)
Percent of residents rec'v Medicaid***	15.85 (3.80)	13.67 (2.82)

***=p<0.0001

**=p<0.001

*=p<0.05

Table 3.3: Descriptive Characteristics of Bootstrapped Listwise Deletion Sample for Utilization of MAT and Medicaid Coverage of Methadone, Combined 1998-2008, N=25,300

	n (%)
Individuals in States with Medicaid Coverage of Methadone	21584 (85%)
Male	15172 (60%)
Race	
White	16787 (66%)
Black	6910 (27%)
Other Race	1603 (6%)
Hispanic	1738 (7%)
HS Education	16929 (67%)
Married	5124 (20%)
Employed	5061 (20%)
Unstably housed	10303 (41%)
Age	
<18	520 (2%)
18-24	4841 (19%)
25-34	7469 (30%)
35-44	6901 (27%)
≥45	5569 (22%)
Program Type	
Rehabilitation	4854 (19%)
Non-Rehabiltation (Outpatient and Detoxification)	20,446 (81%)
Patient receiving MAT	4883 (19%)
Psych Problems	6995 (28%)
Drug use reported at admit	
Heroin	18004 (71%)

Non prescription Methadone	630 (2%)
Cocaine/Crack	8869 (35%)
Synthetic opioids	8384 (33%)
Benzodiazepine	1926 (8%)
# of subs reported at admit	
1	7735 (31%)
2	8452 (33%)
3	9113 (36%)
IDU	10797 (43%)
Client Insurance Type	
Medicaid	7369 (29%)
Medicare	2044 (8%)
No insurance	13426 (53%)
Private Insurance	2461 (10%)
Primary Source of Income	
Public Assistance	1967 (8%)
Retirement/Pension	3087 (12%)
Other Income	3206 (13%)
No income	10770 (43%)
Salary	6270 (25%)
Continuous variables	**Mean (SD)**
Rate of methadone programs/10K pop	5.89 (3.24)
Rate of individuals in tx/1M pop	35.59 (25.33)
Percent of residents rec'v Medicaid	19.26 (4.65)

Table 3.4: Comparison of Characteristics of Bootstrapped Listwise Deletion Sample by Medicaid Coverage of Methadone, Combined 1998-2008

	Medicaid Coverage	No Medicaid Coverage
	N=21,584	N=3,716
	n (%)	n (%)
Male*	13049 (60%)	2123 (57%)
Race		
White***	13575 (63%)	3212 (86%)
Black***	6548 (30%)	362 (10%)
Other Race***	1461 (7%)	142 (4%)

Hispanic	1463 (7%)	275 (7%)
HS Education*	14529 (67%)	2400 (65%)
Married***	4080 (19%)	1044 (28%)
Employed***	4207 (19%)	854 (23%)
Unstably housed***	9021 (42%)	1282 (35%)
Age		
≤24***	4439 (21%)	922 (25%)
25-34***	6127 (28%)	1342 (36%)
35-44***	6012 (28%)	889 (24%)
≥45***	5006 (23%)	563 (15%)
Program Type		
Rehab***	3833 (18%)	1021 (27%)
Non-Rehab (Outpatient/Detox)***	17751 (82%)	2695 (73%)
Patient receiving MAT***	4680 (22%)	203 (5%)
Psych Problems***	5625 (26%)	1370 (37%)
Drug use reported at admit		
Heroin***	17058 (79%)	946 (25%)
Non prescription Methadone***	384 (2%)	246 (7%)
Cocaine/Crack***	7811 (36%)	1058 (28%)
Synthetic opioids***	5618 (26%)	2766 (74%)
Benzodiazepine***	1510 (7%)	416 (11%)
# of subs reported at admit		
1***	7160 (33%)	575 (15%)
2***	7343 (34%)	1109 (30%)
3***	7081 (33%)	2032 (55%)
IDU***	9716 (45%)	1081 (29%)
Client Insurance Type		
Medicaid***	6842 (32%)	527 (14%)
Medicare	1742 (8%)	302 (8%)
No insurance***	10761 (50%)	2665 (71%)
Private Insurance***	2239 (10%)	222 (6%)
Primary Source of Income		
Public Assistance***	1753 (8%)	214 (6%)
Retirement/Pension***	2851 (13%)	236 (6%)
Other Income***	2896 (13%)	310 (8%)
No income***	8906 (41%)	1864 (50%)
Salary***	5178 (24%)	1092 (29%)
	Medicaid Coverage	No Medicaid Coverage

	N=21,584	N=3,716
Continuous variables		
Rate of methadone programs/10K pop***	6.56	1.99
Rate of individuals in tx/1M pop***	40.15	9.11
Percent of residents rec'v Medicaid***	18.9	21.32

***p=<.0001

**p=<.001

*p<.05

Table 3.5: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Utilization of MAT and Medicaid Coverage of Methadone, Combined 1998-2008, N=25,300

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Methadone covered	4.79***	4.14-5.54	4.48***	3.87-5.21	3.03***	2.58-3.56	3.16***	2.69-3.73	6.11***	5.03-7.40	6.42***	5.26-7.78	5.37***	3.72-7.76
Male			0.66***	0.62-0.71	0.64***	0.59-0.68	0.65***	0.60-0.70	0.73***	0.68-0.79	0.733***	0.68-0.79	0.73***	0.68-0.79
Race														
Black			1.54***	1.42-1.67	1.26***	1.13-1.39	1.19*	1.07-1.31	0.88*	0.79-0.98	0.88*	0.79-0.98	0.88*	0.79-0.98
Other Race			0.59***	0.50-0.71	0.52***	0.43-0.62	0.53***	0.44-0.64	0.57***	0.47-0.68	0.55***	0.46-0.67	0.55***	0.46-0.68
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			1.85***	1.59-2.15	1.68***	1.44-1.97	1.73***	1.48-2.04	1.57***	1.33-1.85	1.57***	1.34-1.85	1.57***	1.34-1.86
HS Education			0.90*	0.84-0.97	0.87**	0.81-0.94	0.90**	0.83-0.97	0.93	0.87-1.01	0.94	0.85-1.01	0.94	0.87-1.02
Married			1.22***	1.13-1.32	1.27***	1.17-1.39	1.26***	1.15-1.37	1.19**	1.09-1.30	1.19**	1.09-1.30	1.19**	1.09-1.30
Employed			1.90***	1.76-2.06	1.88***	1.72-2.05	1.48***	1.30-1.69	1.30**	1.13-1.50	1.27**	1.11-1.47	1.28**	1.11-1.47
Unstably Housed			1.03	0.96-1.10	1.16***	1.08-1.25	1.15**	1.07-1.25	0.91*	0.85-1.00	0.92	0.85-1.00	0.92	0.85-1.00
Age agelt24														
age2534			0.32***	0.28-0.36	0.33***	0.29-0.38	0.33***	0.29-0.38	0.37***	0.32-0.42	0.37***	0.32-0.42	0.37***	0.32-0.42
age3544			0.53***	0.49-0.59	0.57***	0.51-0.62	0.54***	0.49-0.60	0.63***	0.56-0.70	0.62***	0.56-0.69	0.62***	0.56-0.69
age45ov (ref)			0.70***	0.65-0.77	0.74***	0.68-0.81	0.72***	0.65-0.78	0.76***	0.70-0.84	0.76***	0.69-0.83	0.76***	0.69-0.83
Rehab			ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Psych problems					0.17***	0.14-0.20	0.16***	0.14-0.19	0.16***	0.14-0.19	0.16***	0.14-0.19	0.16***	0.14-0.19
Drug Use					0.76***	0.69-0.83	0.76***	0.70-0.84	0.89*	0.80-0.97	0.90*	0.81-0.98	0.90*	0.81-0.98
Heroin														
Non-rx Methadone					5.64***	4.77-6.62	5.75***	4.88-6.80	6.44***	5.41-7.66	6.42***	5.37-7.61	6.36***	5.36-7.60
Cocaine					8.94***	7.17-11.08	8.25***	6.64-10.31	7.17***	5.70-8.98	7.17***	5.74-9.05	7.24***	5.76-9.11
Synthetic Opioids					1.34***	1.20-1.48	1.30***	1.16-1.45	1.22**	1.09-1.36	1.21**	1.09-1.36	1.22**	1.08-1.35
Benzodiazepines					3.94***	3.39-4.58	3.90***	3.36-4.55	3.90***	3.32-4.57	3.94	3.36-4.63	3.97***	3.37-4.65
Ttl # of Drugs Used					1.30**	1.09-1.54	1.43***	1.21-1.71	2.03***	1.69-2.44	2.01***	1.68-2.43	2.03***	1.67-2.42
1														
2					4.18***	3.65-4.77	4.44***	3.88-5.09	4.35***	3.77-4.96	4.35***	3.81-5.01	4.39***	3.82-5.03
3 (ref)					1.99***	1.81-2.21	2.03***	1.83-2.24	1.97***	1.79-2.20	1.99***	1.80-2.22	1.99***	1.79-2.21
IDU					ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Health Insurance Type					1.04***	0.96-1.13	1.06	0.97-1.16	1.31***	1.20-1.44	1.30***	1.19-1.42	1.30***	1.19-1.42
Medicaid														
Medicare							1.09	0.94-1.27	1.52***	1.30-1.78	1.52***	1.30-1.78	1.52***	1.29-1.78
No insurance							0.57***	0.46-0.70	0.88	0.71-1.09	0.87	0.70-1.08	0.86	0.70-1.07
Private Insurance (ref)							1.62***	1.40-1.84	1.39***	1.21-1.60	1.40***	1.22-1.61	1.40***	1.22-1.61
							ref	ref	ref	ref	ref	ref	ref	ref
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI

Primary Income				1.43***	1.22-1.70	1.16	0.98-1.38					
Public Asstistance				0.72***	0.61-0.85	0.55***	0.46-0.65	1.15	0.96-1.36	1.15	0.97-1.37	
Retirement/Pension				1.07	0.92-1.24	0.93	0.80-1.10	0.55***	0.46-0.66	0.55***	0.46-0.66	
Other Income Source				0.61***	0.53-0.70	0.66***	0.57-0.76	0.92	0.78-1.08	0.92	0.79-1.08	
No Income				ref	ref	ref	ref	0.66***	0.57-0.77	0.66***	0.57-0.77	
Salary (ref)								ref	ref	ref	ref	
State Level Variables						1.40***	1.37-1.45					
Methadone Prog Rate						0.93***	0.93-0.94	1.43***	1.39-1.47	1.43***	1.39-1.47	
Rate of Indiv in Tx						1.04***	1.03-1.05	0.93***	0.93-0.94	0.93***	0.93-0.94	
% of res w/Medicaid								1.05***	1.04-1.07	1.05***	1.04-1.07	
Time								0.73***	0.63-0.84	0.59*	0.40-0.88	
Medicaid Cov * Time										1.26	0.83-1.89	

Model 1: Unadjusted association between Medicaid coverage of methadone and MAT use
Model 2: Medicaid coverage of methadone and demographic covariates
Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates
Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates
Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and state-level
Model 6: Medicaid coverage of methadone, demographic covariates, substance useI and treatment covariates, health insurance and income covariates, state-level
Model 7: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level ***=p<0.0001
**=p<0.001
*=p<0.05

Table 3.6: Model Building Summary Using Listwise Deletion Sample for Utilization of MAT and Medicaid Coverage of Methadone, Combined 1998-2008, N=90,005

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Methadone covered	4.41***	4.10-4.75	4.22***	3.90-4.53	2.80***	2.59--3.05	2.94***	2.72-3.20	5.58***	5.04-6.13	5.81***	5.26-6.41	4.30***	3.61-5.18
Male			0.68***	0.66-0.71	0.65***	0.63-0.68	0.66***	0.63-0.68	0.76***	0.73-0.79	0.76***	0.73-0.79	0.76***	0.73-0.79
Race														
Black			1.55***	1.49-1.63	1.23***	1.16-1.30	1.14***	1.08-1.21	0.89***	0.84-0.94	0.88***	0.83-0.93	0.88***	0.83-0.93
Other Race			0.63***	0.57-0.69	0.53***	0.48-0.58	0.55***	0.50-0.60	0.61***	0.55-0.67	0.60***	0.54-0.66	0.59***	0.54-0.66
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			1.77***	1.63-1.91	1.65***	1.52-1.80	1.72***	1.58-1.87	1.51***	1.39-1.65	1.51***	1.39-1.65	1.51***	1.39-1.65
HS Education			0.89***	0.85-0.92	0.86***	0.83-0.90	0.90***	0.86-0.93	0.94*	0.91-0.99	0.95*	0.91-0.99	0.94*	0.91-0.99
Married			1.24***	1.18-1.28	1.31***	1.25-1.37	1.30***	1.24-1.35	1.22***	1.16-1.28	1.22***	1.16-1.28	1.22***	1.16-1.28
Employed			2.03***	1.95-2.12	1.97***	1.88-2.06	1.55***	1.45-1.67	1.40***	1.31-1.52	1.39***	1.29-1.50	1.39***	1.30-1.50
Unstably Housed			1.03	0.99-1.07	1.17***	1.13-1.22	1.19***	1.14-1.23	0.93**	0.89-0.97	0.93*	0.89-0.97	0.93*	0.89-0.97
Age														
<24			0.36***	0.34-0.38	0.38***	0.35-0.40	0.38***	0.36-0.41	0.43***	0.40-0.47	0.44***	0.40-0.46	0.43***	0.40-0.46
25-34			0.56***	0.53-0.59	0.58***	0.56-0.62	0.58***	0.55-0.61	0.66***	0.63-0.70	0.66***	0.62-0.70	0.66***	0.63-0.70
35-44			0.70***	0.68-0.74	0.74***	0.71-0.78	0.73***	0.69-0.76	0.79***	0.75-0.82	0.77***	0.73-0.81	0.77***	0.73-0.81
>44 (ref)			ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Rehab					0.16***	0.15-0.18	0.16***	0.14-0.17	0.16***	0.15-0.17	0.16***	0.14-0.17	0.16***	0.14-0.17
Psych problems					0.83***	0.79-0.86	0.84***	0.79-0.87	0.96	0.91-1.01	0.97	0.92.1.02	0.97	0.92-1.02
Drug Use														
Heroin					6.17***	5.68-6.74	6.36***	5.82-6.92	7.03***	6.44-7.72	6.96***	6.36-7.62	6.96***	6.32-7.58
Non-rx Methadone					7.17***	6.33-8.06	6.69***	5.94-7.59	6.23***	5.50-7.07	6.23***	5.50-7.07	6.30***	5.54-7.12
Cocaine					1.39***	1.32-1.48	1.36***	1.29-1.44	1.30***	1.23-1.38	1.30***	1.23-1.38	1.31***	1.23-1.38
Synthetic Opioids					4.10***	3.80-4.43	4.06***	3.75-4.39	4.10***	3.79-4.47	4.18***	3.83-4.52	4.18***	3.85-4.54
Benzodiazepines					1.30***	1.18-1.41	1.43***	1.31-1.57	1.97***	1.79-2.17	1.95***	1.78-2.16	1.97***	1.79-2.17
Ttl # of Drugs Used														
1					3.97***	3.72-4.28	4.31***	3.99-4.60	4.26***	3.96-4.58	4.31***	4.00-4.61	4.31***	4.01-4.63
2					1.90***	1.80-2.00	1.93***	1.84-2.05	1.92***	1.82-2.03	1.93***	1.83-2.04	1.93***	1.83-2.04
3 (ref)					ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
IDU					0.99	0.95-1.03	1.01	0.97-1.06	1.26***	1.20-1.32	1.25***	1.19-1.31	1.25***	1.19-1.31
Health Insurance Type														
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI

Medicaid				0.99	0.91-1.07	1.39***	1.28-1.52	1.39***	1.28-1.51	1.39***	1.27-1.51
Medicare				0.58***	0.52-0.64	0.90	0.81-1.01	0.90	0.80-1.00	0.89*	0.80-1.00
No insurance				1.63***	1.52-1.75	1.42***	1.31-1.52	1.42***	1.32-1.53	1.42***	1.32-1.53
Private Insurance (ref)				ref	ref	ref	ref	ref	ref	ref	ref
Primary Income											
Public Asstistance				1.46***	1.35-1.60	1.26***	1.15-1.38	1.25***	1.14-1.37	1.26***	1.14-1.37
Retirement/Pension				0.84***	0.77-0.92	0.64***	0.59-0.71	0.65***	0.59-0.71	0.65***	0.59-0.71
Other Income Source				1.07	0.99-1.16	0.98	0.90-1.06	0.97	0.89-1.05	0.97	0.89-1.06
No Income				0.61***	0.57-0.66	0.68***	0.63-0.73	0.69***	0.64-0.74	0.68***	0.63-0.74
Salary (ref)				ref	ref	ref	ref	ref	ref	ref	ref
State Level Variables											
Methadone Prog Rate						1.39***	1.37-1.40	1.40***	1.39-1.43	1.40***	1.39-1.43
Rate of Indiv in Tx						0.93***	0.93-0.94	0.93***	0.93-0.94	0.93***	0.93-0.94
% of res w/Medicaid						1.04***	1.03-1.04	1.05***	1.04-1.06	1.05***	1.04-1.06
Time								0.73***	0.67-0.78	0.51***	0.42-0.62
Medicaid Cov * Time										1.48**	1.21-1.81

Model 1: Unadjusted association between Medicaid coverage of methadone and MAT use
Model 2: Medicaid coverage of methadone and demographic covariates
Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates
Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance and income covariates
Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates and stateModel 6: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level Model 7: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and income covariates, state-level ***=p<0.0001
**=p<0.001
*=p<0.05

Table 3.7: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Utilization of MAT and Medicaid Coverage of Methadone, 2008, N=24,600

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI

Methadone covered	5.24***	4.46-6.16	4.86***	4.12-5.73	3.32***	2.79-3.99	3.53***	2.93-4.21	8.16***	7.51-10.22
Male			0.68***	0.63-0.73	0.65***	0.61-0.70	0.65***	0.61-0.70	0.76***	0.71-0.82
Race										
Black			1.67***	1.53-1.82	1.25***	1.13-1.39	1.16*	1.04-1.30	0.86*	0.77-0.96
Other Race			0.65***	0.54-0.78	ref 0.57***	0.48-0.69	0.59***	0.49-0.72	0.65***	0.54-0.79
White (ref)			ref		ref	ref	ref	ref	ref	ref
Hispanic			1.63***	1.39-1.90	1.40***	1.20-1.65	1.48***	1.26-1.75	1.40***	1.19-1.66
HS Education			0.87**	0.81-0.94	0.84***	0.79-0.91	0.88**	0.81-0.95	0.92*	0.85-1.00
Married			1.26***	1.16-1.37	1.34***	1.23-1.46	1.31***	1.20-1.43	1.22***	1.12-1.34
Employed			2.05***	1.88-2.23	1.97***	1.81-2.17	1.63***	1.41-1.88	1.52***	1.31-1.78
Unstably Housed			1.13**	1.05-1.21	1.30***	1.20-1.40	1.28***	1.18-1.39	0.97	0.89-1.06
Age agelt24										
age2534 age3544			0.38***	0.34-0.43	0.40***	0.35-0.46	0.39***	0.35-0.45	0.43***	0.34-0.49
age45ov (ref)			0.57***	0.51-0.62	0.57***	0.52-0.63	0.55***	0.50-0.62	0.62***	0.55-0.69
Rehab			0.69***	0.63-0.75	ref 0.70***	0.64-0.77	0.69***	0.63-0.76	0.76***	0.69-0.83
Psych problems			ref		ref	ref	ref	ref	ref	ref
Drug Use					0.20***	0.17-0.23	0.19***	0.17-0.23	0.20***	0.17-0.23
Heroin					0.84**	0.77-0.92	0.85**	0.78-0.94	1.02	0.93-1.13
Non-rx Methadone										
Cocaine					5.47***	4.63-6.45	5.53***	4.68-6.55	6.05***	5.08-7.22
Synthetic Opioids					7.24***	5.74-9.06	6.62***	5.24-8.32	6.17***	4.88-7.86
Benzodiazepines					1.36***	1.22-1.52	1.32***	1.18-1.48	1.25***	1.11-1.40
Ttl # of Drugs Used					3.67***	3.16-4.27	3.56***	3.06-4.15	3.78***	3.22-4.45
1					1.04	0.86-1.25	1.16	0.96-1.40	1.62***	1.33-1.98
2										
3 (ref)					3.86***	3.35-4.41	4.10***	3.56-4.69	3.94***	3.42-4.52
IDU					1.95***	1.76-2.16	1.97***	1.78-2.20	1.92***	1.72-2.13
Health Insurance Type					ref	ref	ref	ref	ref	ref
Medicaid					0.94	0.86-1.03	0.96	0.88-1.05	1.26***	1.14-1.38
Medicare										
No insurance							0.94	0.81-1.11	1.36**	1.15-1.61
Private Insurance (ref)							0.51***	0.41-0.63	0.86	0.68-1.08
Primary Income							1.57***	1.36-1.82	1.40***	1.21-1.63
Public Asstistance							ref	ref	ref	ref
Retirement/Pension										
Other Income Source							1.39**	1.17-1.66	1.19	0.98-1.43
No Income							0.84*	0.70-0.99	0.65***	0.54-0.78
Salary (ref)							1.20*	1.02-1.41	1.06	0.93-1.26
State Level Variables							0.68***	0.59-0.78	0.75**	0.64-0.88
Methadone Prog Rate							ref	ref	ref	ref
Rate of Indiv in Tx										
% of res w/Medicaid									1.42***	1.38-1.46
									0.93***	0.93-0.94
									1.05***	1.04-1.07

Model 1: Unadjusted association between Medicaid coverage of methadone and MAT use
Model 2: Medicaid coverage of methadone and demographic covariates
Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates
Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health
Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health ***=p<0.0001
**=p<0.001 *=p<0.05

Table 3.8: Model Building Summary Using Listwise Deletion Sample for Utilization of MAT and Medicaid Coverage of Methadone 2008, N=81,694

	Model 1	Model 2	Model 3	Model 4	Model 5

	OR	95 % CI	OR	95 % CI	OR	95 % CI	OR	95 % CI	OR	95 % CI
Methadone covered	4.72***	4.34-5.12	4.39***	4.03-4.78	3.00***	2.74-3.30	3.19***	2.90-3.50	8.00***	7.08-8.99
Male			0.67***	0.65-0.70	0.64***	0.62-0.67	0.64***	0.62-0.67	0.75***	0.72-0.78
Race										
Black			1.72***	1.64-1.80	1.30***	1.23-1.38	1.22***	1.15-1.29	0.86***	0.81-0.91
Other Race			0.56***	0.51-0.62	0.47***	0.42-0.52	0.49***	0.44-0.54	0.56***	0.50-0.62
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			2.01***	1.84-2.18	1.88***	1.72-2.05	1.95***	1.80-2.15	1.75***	1.60-1.92
HS Education			0.88***	0.84-0.91	0.85***	0.82-0.89	0.88***	0.85-0.92	0.94*	0.90-0.98
Married			1.26***	1.21-1.32	1.32***	1.27-1.39	1.31***	1.24-1.37	1.23***	1.18-1.30
Employed			2.05***	1.97-2.16	1.97***	1.88-2.08	1.51***	1.40-1.63	1.40***	1.30-1.53
Unstably Housed			1.13***	1.08-1.17	1.27***	1.22-1.32	1.27***	1.21-1.32	0.93*	0.89-0.98
Age agelt24										
			0.39***	0.36-0.41	0.41***	0.38-0.44	0.41***	0.38-0.44	0.43***	0.40-0.47
age2534			0.59***	0.56-0.63	0.61***	0.58-0.65	0.60***	0.57-0.64	0.66***	0.62-0.70
age3544			0.69***	0.66-0.73	0.71***	0.680.75	0.70***	0.66-0.73	0.76***	0.72-0.80
age45ov (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Rehab					0.19***	0.17-0.21	0.18***	0.17-0.20	0.19***	0.18-0.21
Psych problems					0.84***	0.81-0.89	0.85***	0.81-0.90	1.02	0.96-1.07
Drug Use										
Heroin					5.42***	4.96-5.97	5.53***	5.06-6.10	6.05***	5.51-6.69
Non-rx Methadone					7.54***	6.62-8.53	6.96***	6.14-7.91	6.49***	5.67-7.37
Cocaine					1.35***	1.28-1.44	1.32***	1.25-1.41	1.26***	1.19-1.35
Synthetic Opioids					3.63***	3.36-3.97	3.60***	3.29-3.90	3.78***	3.44-4.12
Benzodiazepines					1.14*	1.03-1.25	1.26***	1.14-1.39	1.79***	1.60-1.98
Ttl # of Drugs Used										
1					3.82***	3.54-4.11	4.10***	3.78-4.40	3.94***	3.64-4.25
2					1.86***	1.75-1.97	1.90***	1.78-2.00	1.84***	1.73-1.95
3 (ref)					ref	ref	ref	ref	ref	ref

IDU			0.92**	0.88-0.97	0.94*	0.90-0.99	1.23***	1.18-1.30
Health Insurance Type								
Medicaid					0.98	0.90-1.07	1.35***	1.23-1.48
Medicare					0.59***	0.53-0.66	0.93	0.82-1.05
No insurance					1.60***	1.49	1.38***	1.28-1.50
Private Insurance (ref)					ref	1.74	ref	ref
Primary Income								
Public Asstistance					1.35***	1.23-1.48	1.19**	1.07-1.31
Retirement/Pension					0.76***	0.69-0.83	0.59***	0.53-0.65
Other Income Source					1.04	0.95-1.13	0.95	0.87-1.04
No Income					0.61***	0.56-0.65	0.68***	0.63-0.75
Salary (ref)					ref	ref	ref	ref
State Level Variables								
Methadone Prog Rate							1.43***	1.41-1.46
Rate of Indiv in Tx							0.93***	0.93-0.93
% of res w/Medicaid							1.07***	1.06-1.08

Model 1: Unadjusted association between Medicaid coverage of methadone and MAT use
Model 2: Medicaid coverage of methadone and demographic covariates
Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates
Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health
Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health ***=p<0.0001
**=p<0.001
*=p<0.05

Table 3.9: Model Building Summary Using Multiple Imputation Sample for Utilization of MAT and Medicaid Coverage of Methadone, 2008, N=2,305,020

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Methadone covered	2.79*	2.73-2.84	2.72***	2.66-2.78	1.95***	1.91-2.00	1.97***	1.93-2.01	2.59***	2.54-2.65
Male			0.75***	0.75-0.76	0.73***	0.73-0.74	0.76***	0.75-0.76	0.79***	0.79-0.80
Race										
Black			1.22***	1.21-1.23	1.12***	1.10-1.12	1.06***	1.05-1.07	1.05***	1.04-1.07
Other Race			1.16***	1.15-1.18	1.16***	1.14-1.17	1.12***	1.10-1.13	1.11***	1.09-1.12
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			1.49***	1.47-1.51	1.30***	1.28-1.31	1.27***	1.26-1.29	1.27***	1.25-1.28
HS Education			0.90***	0.89-0.90	0.89***	0.88-0.89	0.90***	0.90-0.91	0.91***	0.91-0.92

Married		1.09***	1.08-1.10	1.14***	1.13-1.15	1.16***	1.15-1.17	1.13***	1.12-1.14
Employed		1.77***	1.76-1.79	1.73***	1.71-1.74	1.67***	1.64-1.69	1.57***	1.56-1.60
Unstably Housed		0.61***	0.60-0.61	0.68***	0.67-0.68	0.68***	0.68-0.69	0.64***	0.63-0.64
Age									
agelt24		0.38***	0.37-0.38	0.44***	0.43-0.44	0.45***	0.44-0.45	0.48***	0.48-0.49
age2534		0.55***	0.55-0.56	0.58***	0.58-0.59	0.58***	0.58-0.59	0.63***	0.62-0.63
age3544		0.66***	0.65-0.66	0.70***	0.69-0.71	0.70***	0.69-0.70	0.74***	0.74-0.75
age45ov (ref)		ref	ref	ref	ref	ref	ref	ref	ref
Rehab				0.13***	0.13-0.14	0.13***	0.13-0.14	0.13***	0.13-0.14
Psych problems				0.99	0.99-1.00	0.98**	0.98-0.99	1.08***	1.08-1.09
Drug Use									
Heroin				5.64***	5.57-5.73	5.58***	5.51-5.68	6.55***	6.46-6.66
Non-rx Methadone				6.69***	6.53-6.79	6.55***	6.45-6.72	6.75***	6.62-6.89
Cocaine				1.57***	1.55-1.58	1.54***	1.53-1.56	1.65***	1.63-1.66
Synthetic Opioids				3.42***	3.38-3.48	3.42***	3.39-3.48	3.46***	3.39-3.49
Benzodiazepines				1.38***	1.36-1.40	1.39***	1.38-1.42	1.51***	1.49-1.54
Ttl # of Drugs Used									
1				5.05***	5.00-5.12	5.21***	5.12-5.25	5.10***	5.02-5.15
2				2.25***	2.22-2.26	2.25***	2.23-2.27	2.18***	2.15.2.20
3 (ref)				ref	ref	ref	ref	ref	ref
IDU				1.13***	1.12-1.14	1.15***	1.14-1.15	1.09***	1.08-1.10
Health Insurance Type									
Medicaid						1.38***	1.36-1.40	1.31***	1.30-1.34
Medicare						1.03*	1.01-1.04	0.91***	0.90-0.93
No insurance						1.34***	1.32-1.35	1.19***	1.17-1.20
Private Insurance (ref)						ref	ref	ref	ref
Primary Income									
Public Asstistance						1.52***	1.50-1.55	1.43***	1.42-1.47
Retirement/Pension						0.88***	0.86-0.89	0.91***	0.89-0.93
Other Income Source						0.91***	0.90-0.93	0.90***	0.88-0.91

No Income				0.83***	0.82-0.84	0.76***	0.75-0.77
Salary (ref)				ref	ref	ref	ref
State Level Variables							
Methadone Prog Rate						1.003*	1.00-1.01
Rate of Indiv in Tx						0.99***	0.99-0.99
% of res w/Medicaid						1.02***	1.02-1.02

Model 1: Unadjusted association between Medicaid coverage of methadone and MAT use
Model 2: Medicaid coverage of methadone and demographic covariates
Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates
Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance
Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance
***=p<0.0001
**=p<0.001
*=p<0.05

Table 3.10: Model Building Summary Using Bootstrapped Listwise Deletion Sample for Utilization of MAT and Medicaid Coverage of Methadone, 1998, N=25,000

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI

Methadone covered	4.22***	3.84-4.65	4.48***	4.05-4.94	3.39***	3.05-3.80	2.75***	2.45-3.07	2.32***	2.06-2.62
Male			0.84***	0.79-0.89	0.82***	0.76-0.88	0.93	0.87-1.01	0.94	0.87-1.02
Race										
Black			0.90*	0.83-0.96	0.85**	0.78-0.93	0.76***	0.70-0.84	0.63***	0.56-0.69
Other Race			0.97	0.85-1.11	0.75**	0.64-0.88	ref	0.75**	0.64-0.89	ref	0.78*	0.66-0.92	ref
White (ref)			ref	ref		ref		ref		ref
Hispanic			0.75***	0.66-0.86	0.70***	0.60-0.83	0.72***	0.61-0.85	0.82*	0.69-0.96
HS Education			0.95	0.88-1.01	0.98	0.91-1.06	1.06	0.98-1.15	1.11*	1.02-1.19
Married			0.92*	0.86-0.99	1.00	0.92-1.09	1.09*	1.01-1.19	1.11*	1.02-1.20
Employed			1.57***	1.46-1.67	1.31***	1.22-1.42	1.51***	1.35-1.68	1.62***	1.44-1.81
Unstably Housed			0.43***	0.40-0.46	0.51***	0.47-0.55	0.55***	0.51-0.59	0.51***	0.47-0.55
Age agelt24										
age2534 age3544			0.26***	0.23-0.30	0.30***	0.26-0.35	0.35***	0.31-0.41	0.33***	0.29-0.39
age45ov (ref)			0.50***	0.46-0.55	0.64***	0.57-0.71	0.70***	0.63-0.79	0.69***	0.62-0.77
Rehab			0.66***	0.61-0.72	0.78***	0.71-0.86	ref	0.82***	0.74-0.90	ref	0.80***	0.72-0.89	ref
Psych problems			ref	ref		ref		ref		ref
Drug Use										
Heroin					0.02***	0.02-0.03	0.02***	0.02-0.03	0.02***	0.02-0.03
Non-rx Methadone					0.84***	0.77-0.91	0.77***	0.70-0.85	0.75***	0.69-0.82
Cocaine										
Synthetic Opioids					23.34***	19.79-27.68	25.28***	21.22-29.96	22.65***	18.99-26.82
Benzodiazepines					3.90***	2.98-5.13	4.71***	3.57-6.19	4.71***	3.56-6.20
Ttl # of Drugs Used					1.60***	1.44-1.76	1.60***	1.45-1.77	1.54***	1.39-1.71
1					9.97***	8.59-11.55	11.13***	9.58-13.02	12.18***	10.49-14.27
2					4.57***	3.90-5.38	4.85***	4.12-5.75	5.00***	4.23-5.90
3 (ref)										
IDU					7.32***	6.49-8.27	7.69***	6.80-8.71	7.39***	6.55-8.40
Health Insurance Type					2.51***	2.28-2.74	2.66***	2.43-2.92	2.61***	2.38-2.86	ref
Medicaid					ref	ref	ref	ref		ref
Medicare					1.40***	1.29-1.52	1.51***	1.39-1.64	1.63***	1.50-1.78
No insurance										
Private Insurance (ref)							1.90***	1.64-2.19	2.18***	1.89-2.54
Primary Income							0.57***	0.47-0.69	0.58***	0.48-0.70
Public Asstistance							1.70***	1.52-1.90	1.84***	1.65-2.07	ref
Retirement/Pension							ref	ref		ref
Other Income Source										
No Income							1.97***	1.69-2.31	2.10***	1.79-2.45
Salary (ref)							1.99***	1.71-2.33	2.27***	1.94-2.66
State Level Variables							1.48***	1.30-1.69	1.51***	1.32-1.72
Methadone Prog Rate							0.52***	0.46-0.60	0.678***	0.59-0.78	ref
Rate of Indiv in Tx							ref	ref		ref
% of res w/Medicaid										
									1.12*	1.04-1.20
									1.00	0.98-1.01
									0.94***	0.93-0.97

Model 1: Unadjusted association between Medicaid coverage of methadone and MAT use

Model 2: Medicaid coverage of methadone and demographic covariates

Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates

Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance

Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and

***=p<0.0001

**=p<0.001

*=p<0.05

Table 3.11: Model Building Summary Using Listwise Deletion Sample for Utilization of MAT and Medicaid Coverage of Methadone, 1998, N=8,311

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI

Methadone covered	4.02***	3.42-4.73	4.24***	3.59-5.01	3.19***	2.66-3.84	2.57***	2.12-3.11	2.18***	1.78-2.67
Male			0.84*	0.75-0.93	0.82*	0.72-0.93	0.92	0.80-1.05	0.92	0.81-1.05
Race										
Black			0.89	0.78-1.01	0.85*	0.72-0.99	0.76*	0.64-0.90	0.63***	0.53-0.76
Other Race			1.06	0.84-1.34	0.88	0.67-1.15	ref	0.87	0.66-1.15	ref	0.90	0.68-1.18
White (ref)			ref	ref		ref		ref		ref	ref
Hispanic			0.75*	0.59-0.94	0.66*	0.51-0.86	0.69*	0.53-0.90	0.76*	0.58-0.99
HS Education			0.95	0.85-1.08	0.96	0.84-1.09	1.04	0.91-1.20	1.08	0.94-1.24
Married			0.95	0.84-1.07	1.01	0.88-1.16	1.11	0.95-1.27	1.12	0.97-1.29
Employed			1.51***	1.35-1.69	1.28**	1.13-1.46	1.47**	1.21-1.78	1.57***	1.29-1.91
Unstably Housed			0.44***	0.39-0.50	0.51***	0.45-0.59	0.56***	0.49-0.64	0.52***	0.45-0.60
Age agelt24										
age2534 age3544			0.28***	0.23-0.35	0.32***	0.25-0.40	0.37***	0.29-0.48	0.35***	0.28-0.46
age45ov (ref)			0.51***	0.44-0.60	0.62***	0.51-0.74	0.67***	0.55-0.81	0.65***	0.54-0.79
Rehab			0.67***	0.58-0.78	0.77*	0.65-0.91	ref	0.80*	0.67-0.95	ref	0.78*	0.66-0.93
Psych problems			ref	ref		ref		ref		ref	ref
Drug Use											0.02***	0.01-0.03
Heroin					0.02***	0.01-0.03	0.02***	0.01-0.03	0.75**	0.64-0.88
Non-rx Methadone					0.83*	0.71-0.97		0.76*	0.65-0.90		
Cocaine											19.89***	4.82-26.71
Synthetic Opioids					20.25***	15.20-26.97		21.83***	16.27-29.32	5.16***	3.23-8.22
Benzodiazepines					4.45***	2.82-7.01		5.15***	3.24-8.18	1.60***	1.35-1.91
Ttl # of Drugs Used					1.66***	1.40-1.96		1.66***	1.40-1.97	11.02***	8.46-14.31
1					9.15***	7.10-11.79		10.07***	7.76-13.09	4.85***	3.65-6.48
2					4.37***	3.31-5.77		4.80***	3.60-6.39		
3 (ref)											7.54***	6.09-9.33
IDU					7.51***	6.09-9.25		7.77***	6.28-9.61	2.53***	2.16-2.98
Health Insurance Type					2.44***	2.09-2.85	ref	2.59***	2.21-3.03	ref	ref	ref
Medicaid						ref			ref		1.67***	1.44-1.92
Medicare					1.46***	1.28-1.68		0.45***	1.36-1.80			
No insurance											1.93***	1.50-2.49
Private Insurance (ref)								1.70***	1.33-2.19	0.55**	0.40-0.76
Primary Income								0.54**	0.39-0.75	1.73***	1.43-2.11
Public Asstistance								1.62***	1.33-1.95	ref	ref
Retirement/Pension									ref		
Other Income Source											2.14***	1.63-2.82
No Income								2.03***	1.56-2.68	2.18***	1.66-2.88
Salary (ref)								1.95***	1.49-2.56	1.43*	1.14-1.81
State Level Variables								1.42*	1.13-1.78	0.68*	0.53-0.87
Methadone Prog Rate								0.53***	0.42-0.67	ref	ref
Rate of Indiv in Tx									ref		
% of res w/Medicaid											1.14*	1.01-1.29
											0.99	0.97-1.01
											0.96*	0.92-0.99

Model 1: Unadjusted association between Medicaid coverage of methadone and MAT use
Model 2: Medicaid coverage of methadone and demographic covariates
Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates
Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance
Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance and
***=p<0.0001
**=p<0.001
*=p<0.05
Table 3.12: Model Building Summary Using Multiple Imputation Sample for Utilization of MAT and Medicaid Coverage of Methadone, 1998, N=1,497,260

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Methadone covered	2.38***	2.35-2.43	2.06***	2.02-2.09	1.45***	1.42-1.47	1.57***	1.53-1.59	2.69***	2.63-2.74
Male			0.73***	0.72-0.73	0.68***	0.68-0.69	0.72***	0.71-0.73	0.78***	0.77-0.79
Race										
Black			1.09***	1.08-1.10	1.12***	1.10-1.13	1.03***	1.02-1.05	1.16***	1.15-1.18
Other Race			1.84***	1.82-1.87	1.62***	1.60-1.65	1.55***	1.53-1.59	1.48***	1.46-1.51
White (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Hispanic			0.97***	0.95-0.98	0.90***	0.89-0.92	0.87***	0.85-0.88	0.99	0.97-1.01
HS Education			0.96***	0.95-0.96	0.93***	0.93-0.95	0.96***	0.95-0.97	0.93***	0.92-0.94
Married			0.99*	0.98-1.00	1.04***	1.03-1.05	1.12***	1.10-1.12	1.06***	1.05-1.08
Employed			2.12***	2.10-2.14	2.03***	2.01-2.05	2.83***	2.79-2.89	1.97***	1.94-2.01
Unstably Housed			0.48***	0.48-0.49	0.59***	0.58-0.60	0.59***	0.59-0.60	0.73***	0.72-0.74
Age										
agelt24			0.30***	0.29-0.30	0.34***	0.34-0.35	0.38***	0.37-0.38	0.41***	0.40-0.42
age2534			0.45***	0.45-0.46	0.52***	0.51-0.52	0.53***	0.52-0.53	0.61***	0.60-0.62
age3544			0.64***	0.63-0.64	0.69***	0.68-0.70	0.70***	0.69-0.71	0.76***	0.76-0.77
age45ov (ref)			ref	ref	ref	ref	ref	ref	ref	ref
Rehab					0.07***	0.07-0.07	0.07***	0.07-0.08	0.07***	0.07-0.07
Psych problems					0.55***	0.55-0.56	0.58***	0.57-0.59	0.79***	0.78-0.80
Drug Use										
Heroin					10.18***	9.86-10.46	9.78***	9.52-10.11	15.03***	14.64-15.58
Non-rx Methadone					2.75***	2.66-2.83	2.44***	2.35-2.51	3.25***	3.16-3.37
Cocaine					2.16***	2.13-2.19	2.16***	2.13-2.19	2.34***	2.31-2.37
Synthetic Opioids					3.67***	3.60-3.78	3.67***	3.60-3.78	3.42***	3.32-3.49
Benzodiazepines					2.05***	2.00-2.11	2.10***	2.04-2.15	2.44***	2.38-2.51
Ttl # of Drugs Used										
1					10.18***	9.98-10.29	9.97***	9.85-10.16	10.38***	10.19-10.51
2					2.83***	2.79-2.85	2.80***	2.77-2.84	2.92***	2.89-2.96

3 (ref)			ref	ref	ref	ref	ref	ref
IDU			1.95***	1.94-1.98	1.84***	1.83-1.86	1.26***	1.24-1.27
Health Insurance Type								
Medicaid					2.61***	2.56-2.65	1.86***	1.83-1.90
Medicare					1.48***	1.45-1.50	1.21***	1.19-1.24
No insurance					1.73***	1.71-1.76	1.25***	1.23-1.27
Private Insurance (ref)					ref	ref	ref	ref
Primary Income								
Public Asstistance					1.35***	1.33-1.38	1.05***	1.03-1.07
Retirement/Pension					1.63***	1.59-1.68	1.20***	1.17-1.23
Other Income Source					1.07***	1.06-1.10	0.89***	0.87-0.90
No Income					1.51***	1.48-1.53	0.78***	0.76-0.79
Salary (ref)					ref	ref	ref	ref
State Level Variables								
Methadone Prog Rate							0.84***	0.84-0.85
Rate of Indiv in Tx							0.99***	0.99-0.99
% of res w/Medicaid							1.09***	1.09-1.09

Model 1: Unadjusted association between Medicaid coverage of methadone and MAT use
Model 2: Medicaid coverage of methadone and demographic covariates
Model 3: Medicaid coverage of methadone, demographic covariates and substance use and treatment covariates
Model 4: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates and health insurance
Model 5: Medicaid coverage of methadone, demographic covariates, substance use and treatment covariates, health insurance
***=p<0.0001
**=p<0.001
*=p<0.05

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Healthy Beginnings:
Exploring the impact of parental stress and relationship quality on birth outcomes

By

A dissertation submitted to the Graduate Faculty in Public Health in partial fulfillment of the requirements for the degree of Doctor of Public Health, City University of New York

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This manuscript has been read and accepted for the
Graduate Faculty in Public Health to satisfy the dissertation requirement
for the degree of Doctor of Public Health.

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THE CITY UNIVERSITY OF NEW YORK

Abstract

Healthy Beginnings:
Exploring the impact of parental stress and relationship quality on birth outcomes

By

Advisor: Mary Clare Lennon, Ph.D.

This dissertation consists of three studies exploring the effects of maternal and paternal experiences of stress and perceptions of relationship quality on length of gestation and birth weight. The first study assessed the association of parental relationship quality with the baby's length of gestation and birth weight among 2,072 families in the Fragile Families and Child Wellbeing study. Romantic relationships can be a substantial source of social support as well as stress, and have been shown to influence many health outcomes. Beyond crude relationship characteristics, however, few studies have assessed the association of other dimensions of relationship quality, such as conflict and support, with birth outcomes. No studies have assessed the association of father's report of relationship quality with birth outcomes. In this study, multilevel linear regression analyses found that babies born to fathers who were present at their birth were born significantly heavier and had a longer gestation. The results also showed that greater paternal relationship conflict was associated with lower gestational age among all couples and lower birth weight among unmarried couples.

The second study investigated the association between parental stress during pregnancy with their baby's length of gestation and birth weight among a sample of 270 young couples in southern Connecticut. Many studies have shown that women's experiences of stress during pregnancy are associated with preterm birth and low birth weight; however, men's experiences have largely been ignored. Structural equation modeling of the association between maternal and paternal stress latent variables and birth outcomes showed that greater paternal stress was significantly associated with longer gestation and greater birth weight, while maternal stress was not significantly associated with

these outcomes. The findings from the first two studies suggest that men's experiences and feelings when they are expecting a baby may have a unique contribution to birth outcomes.

The third study assessed the association between parental stress during pregnancy and their own and their partner's poor health behaviors and depressive symptoms among a sample of young couples in lower Connecticut. Many unhealthy behaviors, such as substance use, develop during adolescence and evidence shows that stress is a contributing factor. This association has not been established among pregnant adolescents and little attention has been paid to male partners. Among a sample of 294 young expectant couples, multilevel modeling showed that one's own experiences of stress were associated with more unhealthy behaviors and depressive symptoms for both members of the couple. Cross-over effects were also evident—paternal stress was predictive of more maternal conduct problems, while maternal stress was predictive of less paternal substance use and more depressive symptoms. These findings highlight the importance of social relationships and interactions on health behaviors.

Overall, the results of the three studies suggest that father's experiences during pregnancy matter to their baby's health, and that experiences of stress during pregnancy may impact an expectant couples' own and their partner's health behaviors. This dissertation research treated men's experiences during pregnancy, including experiences of stress and relationship quality, with equal weight to women's experiences when it came to their impact on birth outcomes and health behaviors. Future, research, programs and policies aimed at improving birth outcomes may be strengthened by the inclusion of expectant fathers.

Dedication

To NAME REDACTED, for giving me strength and perspective.

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Chapter I. Introduction and Background

a. Overview and Specific Aims

This dissertation research aims to assess the impact of parental stress on birth outcomes. Despite substantial national prevention efforts, the rates of preterm birth (PTB) and low birth weight (LBW) are higher today than they were two decades ago in the United States (U.S.). These negative birth outcomes disproportionately affect minority populations, cost the U.S. hospital system over $16.8 billion annually and have health effects that persist into adulthood. Improvements in rates of traditional risk factors (e.g. smoking, prenatal care) have not corresponded to improved rates of PTB and LBW, suggesting that other factors are at play. Maternal stress during pregnancy is one such factor that is consistently associated with PTB and LBW. Research has focused on maternal stress and the influence of fathers has been ignored, despite increasing evidence that fathers play an important role in their children's health and development.

This research aims to assess the association of several dimensions of maternal and paternal stress with PTB and LBW, and the psychosocial pathways through which stress affects these outcomes. From a stress and coping framework, it also aims to assess how relationship quality is associated with PTB and LBW. This is the first research to assess the effect of direct report of paternal experiences of stress and relationship quality on birth outcomes. It is also the first research of its kind to use dyadic data analysis methods to parcel out the independent and interactive effect of each parent among couples—particularly among young couples who may be more susceptible to stress and its effects on birth outcomes.

The specific aims of this dissertation research are:

Aim 1: Assess the association of maternal and paternal reports of relationship quality with the gestational age at birth and birth weight of their baby among families in the Fragile Families and Child Wellbeing study.

Aim 2: Investigate the association between maternal and paternal stress during pregnancy with the gestational age at birth and birth weight of their baby among a sample of young couples in southern Connecticut.

Aim 3: Investigate the association between maternal and paternal self-reported stress during pregnancy and their own and their partner's negative health behaviors among a sample of young couples in southern Connecticut.

b. Stress and Preterm Birth and Low Birth Weight

b.1 Public Health Impact

Ensuring the health of our populations starts with ensuring the health of our children even as early as their development in the womb. Preterm birth (PTB; <37 weeks gestation) and low birth weight (LBW; <2,500 grams) are the leading causes of neonatal mortality in the United States (U.S.) today.[1] More than one in 1,000 live births result in infant death due to disorders related to short gestation and low birth weight.[2] Alarmingly, the rate of preterm birth has increased by 21% since 1981 despite substantial national prevention efforts.[3] In addition, every Healthy People initiative since the program's inception in the 1970s has included the goal of reducing the rates of LBW;[4–7] however, the 2013 rates of PTB (11.38%) and LBW (8.02%)[8] were over 50% higher than the 2010 Healthy People target rates of 7.6% and 5.0%, respectively.[4]

The costs of preterm birth and low birth weight are substantial to both individuals and society. Infants born preterm are at greater risk for neonatal morbidity, such as temperature instability, respiratory distress, feeding difficulties, jaundice and Periventricular Leukomalacia (death of white brain matter).[9,10] Evidence also shows that children born preterm and/or with a low birth weight continue to be at an increased risk for developmental delay[11] and behavioral problems during childhood.[12] These same infants are also at increased risk for chronic medical and social disabilities into adulthood, such as cerebral palsy,[13] major psychological disabilities,[13] asthma[14] and cardiovascular problems.[15]

The financial costs of preterm birth and low birth weight are also massive. The average cost for a very pre-term baby is over $190,000 for medical care in the baby's first year alone.[16] As a society, total costs for medical care resulting from preterm birth exceed $16.8 billion annually in the U.S. alone (in 2005 U.S. dollars). This figure does not include the substantial long term educational and productivity costs to individuals and society as a whole.[16] When including early childhood medical care costs, early

intervention services, special education and household and labor market productivity losses due only to the four most common conditions associated with preterm birth, the cost estimate exceeds $26 billion in 2005 U.S. dollars[16] and has likely escalated since.[17,18]

b.2 Rationale for exploring stress as a contributor to PTB and LBW

Researchers have searched for many years to identify potential targets for interventions to reduce the rates of preterm birth and low birth weight in the U.S. Smoking and access to prenatal care, for example, have long been shown to affect birth outcomes on an individual level.[19,20] On a population level, however, while we have successfully reduced rates of smoking during pregnancy and improved access to and use of prenatal care, the rates of PTB and LBW continue to remain high despite these improvements. For example, between 1990 and 2002, the rates of preterm birth and LBW in the U.S. both increased by about 15%,[21] while the rates of maternal smoking declined 38% during this same time period.[22] Other researchers have hypothesized that high rates of negative birth outcomes may be due to changing demographics of childbearing (e.g. increased maternal age and use of assisted reproductive technologies leading to more multiple births) and changes in obstetrical interventions, which have led to more pre-term C-sections and a lower intrauterine fetal death rate.[23–25] These factors certainly contribute to but do not completely explain the high rates of PTB and LBW.[25]

In an effort to identify other potential underlying causes of PTB and LBW, researchers have been exploring the role of maternal stress for many years. The hypothesis that a woman's psychological state during pregnancy may affect the health of her baby dates back to Hippocrates;[26] however, the first published studies defining a link between maternal stress and birth outcomes emerged in the 1950s and research has intensified in the last 40 years.[27] The general premise is that stress causes physiological

and behavioral changes in the pregnant mother that impact the developing fetus and the timing of parturition.

Indeed, greater maternal perceived stress has been associated with physiological changes in the pregnant mother, such as increases in cortisol and cytokine production, which are both thought to play a role in fetal growth and parturition.[28–30] Epidemiological evidence also shows that maternal stress during pregnancy is consistently predictive of negative birth outcomes, including PTB[27,28,31–33] and LBW.[27,31,34,35] The epidemiological evidence, which is discussed in greater detail later in this chapter, varies greatly in the study designs, populations and methodology employed; however, it appears that the size of the effect of maternal stress on PTB and LBW is equivalent to that of other well-established risk factors (e.g. sociodemographic and behavioral factors) for PTB and LBW.[36] In fact, based on the existing evidence, the American Congress of Obstetricians and Gynecologists recommends screening for psychosocial stress as part of prenatal care, citing that it may play a role in PTB and LBW.[37]

Certain U.S. populations are disproportionately affected by severe and chronic stressors and are at increased risk for PTB and LBW. For adolescents and young adults who are racial and/or ethnic minorities, live in urban areas and are from a low socioeconomic status (SES), daily stressors often extend beyond these typical developmental challenges. This population is disproportionately affected by other more severe and chronic stressors, such as neighborhood problems, racism and discrimination.[38] Teen mothers in the U.S. are more likely than older mothers to give birth prematurely and/or have a baby with a low birth weight. In 2013, just under 13% of mothers age 15-19 gave birth preterm (PTB) compared to 10.8% of mothers age 20-34. Additionally, 9.3% of mothers age 15-19 had a baby with a LBW compared to 7.7% of mothers age 20-34.[39] Non-Hispanic black mothers were also more likely than white mothers to have a baby with PTB (16.3% vs. 10.2%) and LBW (13.1% vs. 7.0%).

b.3 Current Prevailing Conceptual Model and Pathways

Stress is an interactive process in which environmental demands exceed one's adaptive capacity, resulting in psychological and physiological changes that can lead to poor health outcomes.[40] The stress process is characterized by three major components: a stressor, an appraisal or perception of the stressor, and a response.[41] Stressors can interact with a person's psychological state, disposition, social support, genetics, as well as their social and environmental context.[42]

Dunkel-Schetter and Lobel[43] offer the most comprehensive framework depicting the pathways through which maternal stress may influence PTB and LBW (Figure I-1). The conceptual model describes how both chronic (persistent or recurrent difficulties over the long term) and acute (discrete threats that are shorter term) stressors can influence birth weight and gestational age at delivery. DunkelSchetter and Lobel's framework synthesizes findings from a large literature examining individual stress components and birth outcomes. Previous studies, however, have been inconsistent in terms of how stress is conceptualized, if a conceptual model is attended to at all, and no studies have assessed all components of this model, including stress exposures, appraisal, responses and birth outcomes.

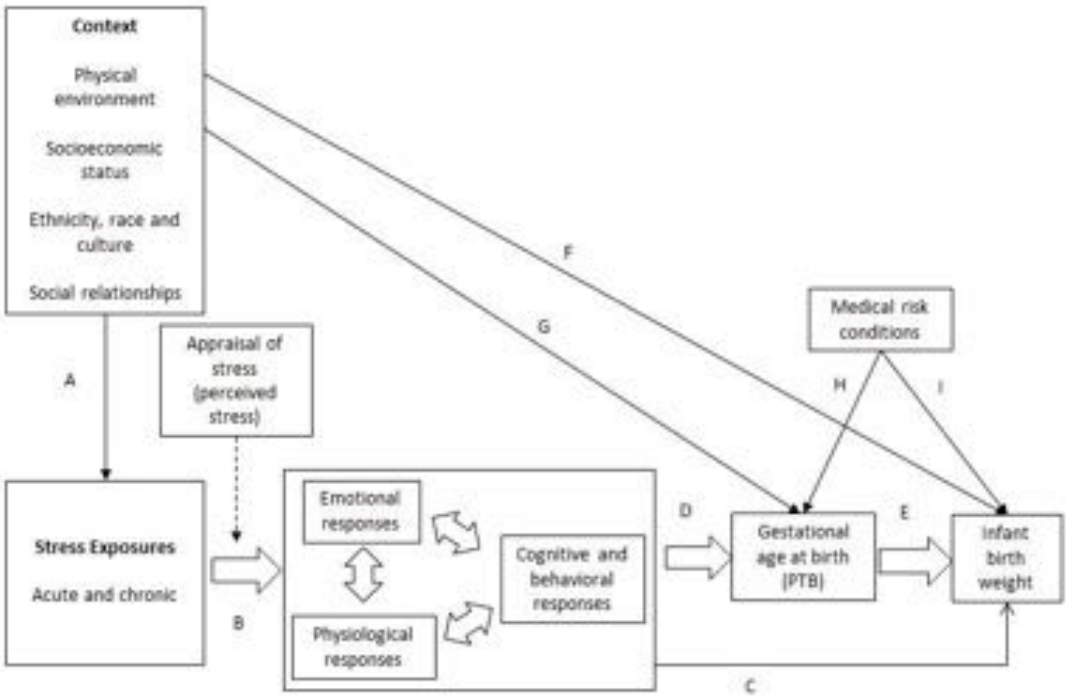

Figure I-1. Conceptual model of stress and birth outcomes. Reproduced from Pregnancy and Birth Outcomes: A multilevel analysis of prenatal maternal stress and birth weight. In: *Handbook of Health Psychology (2nd Edition)* (p.451), by Dunkel-Schetter and Lobel, 2012, New York: Springer.[43]

As depicted in Dunkel-Schetter and Lobel's (2012) model above,[43] the three most commonly hypothesized pathways through which stress affects birth outcomes include behavioral, emotional and physiological responses, which are all interrelated.[43,44] Each of these pathways is described below.

Behavioral Responses

Studies have shown that stress consistently predicts negative health behaviors (e.g. smoking, substance use, dietary habits, physical activity) among both non-pregnant[28,45] and pregnant women.[43,46] These negative health behaviors, which may serve as stress coping mechanisms,[41] are consistently related to adverse birth outcomes. For example, smoking and substance use (cocaine in particular) are well-

documented predictors of PTB,[19] and inadequate nutrition and smoking are risk factors for LBW.[20,43]

Few studies have assessed the full mediational pathway of stress, health behaviors and birth outcomes.[35] One study among an ethnically diverse sample of women, used structural equation modeling (SEM) to show that pregnancy-specific stress (e.g. feeling bothered, worried or upset by whether you might have an unhealthy baby; or paying for the baby's clothes, food or medical care) was not directly related to birth weight, but was predictive of cigarette smoking (unstandardized B=0.22) and cigarette smoking was inversely related to birth weight (unstandardized B=-0.15).[47] In the same study, pregnancy-specific stress was directly predictive of gestational age (GA) at birth (unstandardized B=-0.18) and this association did not change when accounting for smoking.[47] This study suggests that stress may have both a direct physiological effect on birth outcomes and an indirect effect through health behaviors, particularly smoking.

Emotional Responses

Lazarus (2000) described how there are at least fifteen emotions that can result from stress, including sadness, shame and anxiety.[48] These emotions can result from negative appraisals or perceptions of stress. Epidemiological literature shows that stress is consistently associated with increased depressive symptoms among both men and women,[49] and among pregnant women.[50] As Figure I-1 depicts, depressive symptoms may affect both behavioral and physiological responses, and ultimately risk for negative physical health outcomes (Figure I-1),[40] including reproductive health outcomes.

A 2010 meta-analysis of 29 published studies showed that women with depression during pregnancy are at a modest, but statistically significant, increased risk for PTB, LBW and intrauterine growth restriction (IUGR).[51] This meta-analysis estimated that the relative risks increased by 39%-49%

depending on the outcome. To put the magnitude of the effect of major depression or clinically significant depressive symptoms on birth outcomes in perspective, this increase in risk for PTB and LBW is comparable to the increased risk for PTB posed by smoking ten or more cigarettes per day.[52,53]

Physiological Responses

Neuroendocrine

While the relationship between stress and negative birth outcomes has been studied for decades, the precise physiological pathways remain poorly understood.[29] The majority of studies, using both animal and human models, have focused on the endocrine system, and specifically the hypothalamic-pituitary-axis (HPA), which regulates the physiological response to stress through the release of glucocorticoids such as cortisol. This mechanism can become dysregulated under conditions of chronic stress, leading to chronically elevated levels of cortisol in the system.[28]

In pregnant women, the HPA axis is altered to protect the development of the fetus. The secretion of cortisol *stimulates* the secretion of other glucocorticoids in pregnant women, while in the non-pregnant state cortisol shuts off the production of more glucocorticoids.[29] A premature surge of glucocorticoids, which could result from environmental stress, can enter fetal circulation and cause a series of endocrine events, leading to PTB.[28] Evidence demonstrates that elevated levels of corticotropin-releasing hormone, a glucocorticoid involved in the HPA-axis stress response, predicts spontaneous preterm birth, even when controlling for traditional obstetric risk factors.[30] The physiologic pathway between stress and LBW (that is not due to PTB) is less clear; however, evidence from animal studies show that exposure to glucocorticoids, even in short duration, can reduce fetal growth. Studies have shown anywhere between 15%-32% reduction in size across sheep, monkey, rat, mice, and rabbit models, with the effect varying by frequency and quantity of exposure, and animal model.[54,55]

Immune System

The endocrine system also interacts with the immune system,[56] and research shows that psychosocial stress affects immune responses in both non-pregnant humans and animals.[29] Unlike in non-pregnant humans, women's immune systems are altered during pregnancy.[29] Despite important changes in immune system function during pregnancy, little research has examined the role of the immune system in mediating the relationship between stress and fetal development.[29,57] In a recent review of studies linking stress and circulating inflammatory markers (part of the immune response), Christian and colleagues reported only one small study by Coussons-Read et al. (n=24) measuring this association, which found that perceived stress was associated with higher circulating levels of proinflammatory cytokines and lower levels of an anti-inflammatory cytokine among pregnant women in the late first/early second trimester.[58] Christian et al. reported two other studies, one by Ruiz et al. reporting crude differences and one by his research group controlling for pre-pregnancy BMI, both demonstrating that depression was associated with higher circulating levels of pro-inflammatory cytokines.[59,60]

There are several hypothesized pathways through which stress may affect birth outcomes through the inflammatory/immune response. An inflammatory response may trigger preterm delivery by causing preterm contractions, cervical ripening and membrane rupture.[29] Inflammation may also cause hypertension and subsequently preterm birth.[29] Further, stress may increase maternal susceptibility to infection, which can initiate preterm delivery.[27] One such infection, bacterial vaginosis, has been linked to greater risk for spontaneous preterm delivery.[61] The release of catecholamines (an inflammatory response) may also decrease the amount of nutrients the fetus receives and ultimately reduce fetal growth.[28]

b.4 Paternal experiences of stress and their influence on birth outcomes

A large body of literature, described above, has documented that women's experiences of stress during pregnancy are associated with negative birth outcomes;[27,28,31–34,43] however, research has also demonstrated that the perceptions of stress and coping strategies are affected by social relationships.[62] The relationship with the baby's father is often an important social relationship in an expectant woman's life. While an increasing number of mothers are not married when their child is born, over 80% of unmarried women are in a relationship with the baby's father during pregnancy,[63] even among adolescents.[64,65] Thus, a woman's male partner—married or not—is usually an important social relationship during pregnancy and he likely has a substantial influence on the expectant mother during this time.

Despite the importance of male partners during pregnancy, very little research has explored paternal influences in general on birth outcomes.[66] Figure I-2, adapted from Misra (2010),[67] depicts the hypothesized pathways through which paternal factors can influence birth outcomes. Research that has assessed paternal influences on birth outcomes has narrowly focused on paternal demographic characteristics, occupational exposures and "paternal involvement," each of which is most often reported by the mother, introducing concerns about measurement error. A 2010 review by Shah et al. identified 38 studies assessing several paternal factors (age, height, BMI, birth weight, occupation, education and alcohol use) and risks for PTB, LBW and small for gestational age (SGA).[66] Of the eight paternal factors, only three were consistently associated with birth outcomes: extreme paternal age (<20 and >40) was consistently associated with greater risk for LBW, but not consistently with PTB and SGA; greater paternal birth weight consistently predicted greater infant birth weight; and greater paternal height was associated with greater infant birth weight.[66] All of these factors are hypothesized to act through the germ cell line and, thus, through Path a depicted in Figure I-2. Shah's review presents

a rather limited conceptualization of the types of paternal factors that have been considered as contributors to birth outcomes.

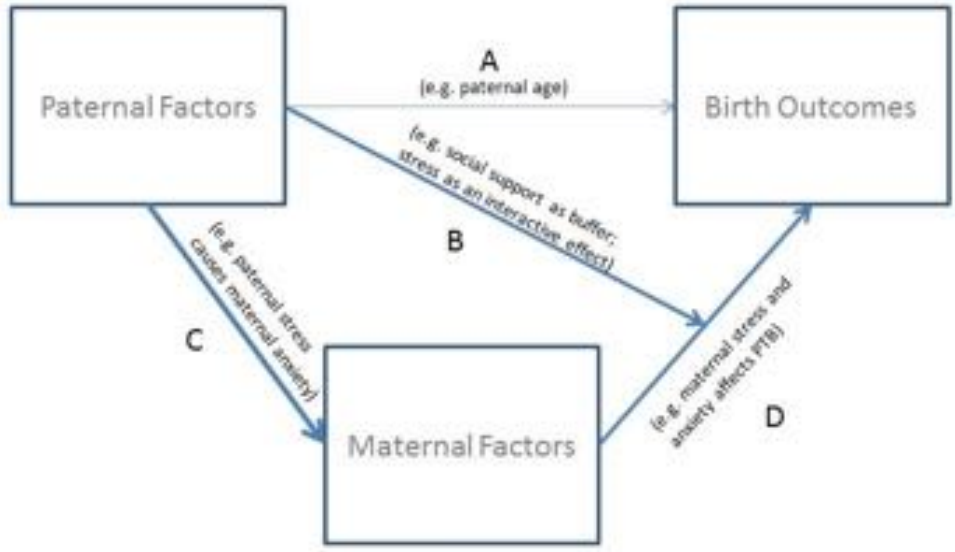

Figure I-2. Conceptual framework of pathways of paternal influence on birth outcomes. Adapted from "Do fathers matter? Paternal contributions to birth outcomes and racial disparities" by D.P. Misra et al. 2010, *American Journal of Obstetrics & Gynecology 202*(2),p.100.[67] Thick lines indicate pathways of interest in this dissertation.

Research examining the impact of maternal stress on birth outcomes that *has* included paternal factors has been limited to *maternal reports* of paternal involvement and support, with the premise that paternal involvement and support reduces maternal stress during pregnancy, thus decreasing the risk for negative birth outcomes.[68] More involved fathers may provide more social support, which has been demonstrated to be an independent predictor (as reported by the mother) of positive birth outcomes, as well as a buffer of the relationship between stress and negative birth outcomes.[69,70] This research is based on the hypothesized pathway depicted by lines B and D in Figure I-2. There is, however, concern about measurement error when we rely solely on maternal report of paternal factors. There could be a

large discrepancy between maternal and paternal report of paternal social support. Maternal report of paternal factors may be more tied to her own psychological state than the true actions of her partner.

In support of the premise that paternal involvement and support can affect maternal psychological health and thus birth outcomes, Alio and colleagues (2010) reviewed seven published studies and found that paternal involvement (measured in various ways across studies) was consistently related to a reduction in the risk for LBW and SGA, in addition to more positive maternal prenatal health behaviors (which may mediate the relationship between paternal involvement and birth outcomes).[68] In addition, a retrospective case-control study of over 2,200 singleton births to mostly Latina women in Los Angeles showed that women with moderate to high partner support during pregnancy (maternal report of how much the baby's father showed he cared for her, did not criticize her and supported her financially during pregnancy) had lower odds of PTB compared to women with low partner support adjusted for several sociodemographic and behavioral factors (aOR=0.73, 95% CI 0.52, 1.01).[71] The retrospective report of partner support however, may be biased by the pregnancy outcome, thus inflating the effect estimate of partner support on PTB. Further, the measures of paternal involvement and support, however, are often crude (e.g. father's name on birth certificate) and reported by the pregnant mother.[68,71]

Men's experiences of stress during his partner's pregnancy may also influence birth outcomes through his effects on maternal psychosocial factors.[67] This pathway is depicted by lines C and D in Figure I-2 below. In fact, substantial evidence supports the theory that among couples, stress experienced by one member can cross-over and affect the well-being of the other member.[72] For example, a woman's partner's stress with his friends may cross-over and impact her own depression.[72] The closeness of a couple may also moderate the cross-over effect, with closer couples experiencing more cross-over of the effects of stress from one member to the other.[73] Much of this research has focused on the cross-over of

one's work stress to the other's well-being[72] and relationship satisfaction (e.g. Neff[74]); however no studies have documented this process among expectant couples, and none have assessed the impact of paternal stress during pregnancy on birth outcomes via effects on maternal well-being.

b.5 Epidemiological Evidence

Preterm Birth

Some recent reviews of the epidemiological literature demonstrate that higher levels of maternal stress predict PTB.[27,28] In Beydoun and Saftlas' 2008 review, nine of eleven human studies found an association between prenatal stress and length of gestation, preterm labor or preterm birth.[27] Littleton's 2010 meta-analysis found that psychosocial stress was not significantly associated with risk for PTB across 13 studies (crude *r* (13)= .04; 95% CI=-0 .03, 0.11).[75]

More recent studies have reported evidence supporting the association between stress and PTB. A prospective cohort study of 1,800 married Chinese women delivering after 32 weeks gestation found that the women reporting the highest levels of severe stressful life events in the first (aRR=2.40; 95% CI 1.13, 5.09) and second trimesters (aRR=2.86; 95% CI 1.26, 6.47) were more likely to experience PTB than women with no life event stress during that time, adjusting for maternal age, education, income, social support, negative coping and infant gender.[31] Women in this study reported on the events in one survey conducted after their third trimester clinical visit referring to events occurring in all trimesters.[31] This method is not truly prospective and there may be measurement error due to the misclassification of the timing of the events. A different prospective cohort study of 415 pregnant English-speaking women from Los Angeles reported that an increase in perceived stress between assessments at 18-20 weeks and 30-32 weeks gestation was a significant predictor of preterm birth when adjusting for race and parity

(aOR=3.08; 95% CI 1.51, 6.28).[32] Further, in a Danish population-based study, the burden of life stress (B=-0.14; 95% CI -0.19, -0.10) and emotional symptoms (e.g. anxiety, nervousness) (B=-0.04; 95% CI -0.07, -0.004) during pregnancy assessed around 30 weeks gestation significantly predicted fewer days of gestation after adjusting for maternal age, socioeconomic status, infant gender, pre-pregnancy body mass index, parity, hypertension, diabetes, and smoking.[33]

Low Birth Weight

The epidemiological evidence supporting the association between stress and LBW is less consistent than the evidence supporting the association with PTB.[28] Low birth weight can result from being born early, from growth restriction in the womb, or both.[43] Thus studies vary in whether they assess crude birth weight and low birth weight (regardless of GA), birth weight adjusted for GA, small for gestational age (SGA), and intrauterine growth restriction (IUGR). The latter two measures are assessments of whether the baby weighs less than 90% of other babies at the same GA.[76]

Beydoun and Saftlas (2008) report that of ten studies, nine identified a significant negative association between prenatal stress and birth weight or fetal growth restriction, most controlling for several important confounders, but not all adjusting simultaneously for maternal age, race/ethnicity, SES, smoking and infection.[27] Littleton's meta-analysis found that psychosocial stress was significantly associated with neonatal weight in 14 studies, (crude *r*= -.07; 95% CI=-.13, -.01) and with low birth weight in 5 studies (crude *r*= -.07; 95% CI=-.03, -.10).[75]

More recent studies have reported less consistent results. Zhu and colleagues (2010), in a study of 1,800 married Chinese women delivering after 32 weeks gestation, found that the perceived impact of severe stressful life events experienced in the first trimester only (reported in one survey after their third trimester clinical visit assessing events in all trimesters) predicted lower birth weight (B=-99.09; 95% CI -137.98, -60.20).[31] Tegethoff, in a study of a Danish population-based birth cohort, alternatively found that

the burden of life stress during pregnancy assessed at about 30 weeks gestation significantly predicted an *increased* birth weight adjusted for GA, maternal age, socioeconomic status, infant gender, pre-pregnancy body mass index, parity, hypertension, diabetes, and smoking (z-score, B=9.14; 95% CI 4.99, 13.28). Emotional symptoms (e.g. anxiety, nervousness) were not significantly predictive of birth weight adjusted for GA in this study.[33] In another study of 294 low-income women delivering in nine Illinois counties, Bryant Borders et al. (2007) reported that several psychosocial factors, including food insecurity (aOR=2.6, 95% CI 1.7,3.5), having a child with a chronic illness at home (aOR=3.1, 95% CI 2.3,4.0), being unemployed (aOR=3.7, 95% CI 2.7,4.7) and poor coping skills (aOR=4.0, 95% CI 3.1,4.9) significantly predicted low birth weight after adjusting for maternal age, while social support, depression and perceived neighborhood safety were not significantly related to low birth weight.[34] Notably, food insecurity may not only be measuring the effect of a stressor on the birth outcome—not having enough food can also directly affect fetal growth by affecting the caloric and nutritional substrate available to the developing fetus.[77]

b.6 Characterization and Measurement of Stress and Emotional Responses

Despite prolific epidemiological research on stress and birth outcomes, studies of the impact of stress on birth outcomes are inconsistent in terms of how stress is conceptualized, if a conceptual model is attended to at all, and, consequently how stress is measured. Most studies of maternal prenatal stress to date have focused on major life event stress (e.g. death of a family member or friend), chronic stressors (e.g. neighborhood problems, racism/discrimination), daily hassles, catastrophic disasters (e.g. terrorist acts), perceived stress, depression and anxiety (including pregnancy-specific anxiety). A review by Chen and colleagues (2011) of 138 studies focused on psychosocial stress and either PTB or LBW, found that the studies used 85 different instruments to measure stress.[78] The widely varying

conceptualization and measurement of stress is likely a major driver of inconsistencies in findings and effect sizes in studies associating stress with birth outcomes,[79] such as the lack of effect on risk for preterm birth found in Littleton's meta-analysis.[80] The major domains of stress and stress responses that are most commonly measured and their associated measurement concerns are discussed below.

Major Life Event Stress

Life event inventories, in which the respondent checks off major life events that they have experienced in a given time frame, are the most common method for capturing levels of external stress exposures.[81] The premise of checklist inventories of stressful life events is the hypothesis that a person's level of experienced stress is the result of the cumulative level of change or readjustment elicited by events happening in their life.[82,83] Research in this area is based on Selye's (1956) argument that environmental events elicit biological changes—changes that, even in small amounts but close in time, can influence susceptibility to negative health (mental and physical) outcomes.[84] Initially researchers posited that any event (either positive or negative) that elicited change or readjustment produced experiences of stress that had implications for health. While positive life events may play some role in producing stress, over time checklist inventories evolved to focus, almost entirely, on negative events after substantial research demonstrated that positive events were only weakly associated with health outcomes, while negative events were much more strongly associated with health outcomes.[85]

<u>Measurement Considerations</u>

There are several measurement considerations when using checklist inventories of stressful life events to quantify stress exposures. First, it is important that inventories contain a list of events that are tailored to the context of the participants (in terms of their roles, contexts and cultures) and the outcome of interest.[81] Tailoring the events in the inventories improves the instrument sensitivity and relevance to

the population.[81] Second, the checklist should also be as comprehensive as possible. If an event that adds to stress is not included, the estimation of the level of stress may be inaccurate.[86] Third, assessing the timing of the events is important in research on stress and birth outcomes, particularly because pregnancy is a sensitive period characterized by rapid fetal development and physiological changes that may affect sensitivity to stressors.[28,29]

Checklist inventories are challenged by several other measurement concerns. Role occupancy can affect the likelihood of event exposure and is particularly relevant in studies of pregnant women.[81] For example, parents with more children are more at risk for experiencing life events related to child care. As such, parents reporting more social roles will experience more stress by virtue of their increased role occupancy.[81] The problem with this is that people with more social roles may be more likely to assume those roles because they have more social competence. Thus, inventories of stressful life events would be confounded with social competence. While we expect the number of experiences of stressful life events to be associated with *more* adverse birth outcomes (one possible health outcome), social competence would (theoretically at least) be related to fewer adverse birth outcomes, and thus the estimate of the effect of stressful life events on adverse birth outcomes would be muted.[72] Studies should adjust for role occupancy to estimate a more accurate effect of stress on the health outcome of interest.[81]

In addition, there is concern that checklist inventories do not accurately ascertain the amount of stress produced by an external stressor. For example, it is probable that certain events (e.g. death of a family member) may produce more stress than others (e.g. having an argument with a family member). Some researchers argue for subjective weighting of events; however applying subjective weights may result in confounding of the stress exposure with coping (or vulnerability to stress). A subjective weight of a stressor may be a function of the ability to resolve the stressor either emotionally or through action

(i.e. coping), and thus subjective ratings confound the effects of stress mediators with stress exposures.[81] Other researchers argue for regression-based weighting, in which the events are weighted in the total index by their effects on the outcome, with a responding criticism that this tactic is not theoretically driven and the weights are not generalizable across studies.[81] Turner and Wheaton argue that unweighted indices are as useful as weighted indices in predicting health outcomes citing evidence that effect sizes are similar, and suggest separately assessing the external stressor and the stress mediators (e.g. coping mechanisms).[81]

Perceived Stress

Measures of stress appraisals and perceptions ascertain the individual's perception and evaluation of potential harm posed by the external demand and their ability to cope with the demand.[71] Constructs typically measured in research on birth outcomes include perceived stress and the psychological impact of stressors.[78] The most common scale measuring general perceived stress is Cohen's Perceived Stress Scale.[78,87] The Perceived Stress Scale includes ten items that assess the degree to which the respondent feels certain situations are stressful (e.g. how often do you feel nervous or stressed, how often do you feel you are unable to control important things in your life).[88]

An issue when assessing the influence of stress appraisals and perceptions on health outcomes is that the instrument is actually measuring individual traits that would be expressed regardless of a stress stimulus.[89] In other words, stress appraisals and perceptions may be highly tied to personality traits that make people more or less reactive to stressors (e.g. self-efficacy or optimism). As such, when we measure perceived stress, we may actually be measuring other personality variables. Because it is often impossible (or too late) to intervene on personality characteristics, stress appraisals and perceptions

may be more amenable to interventions and thus measures should separate appraisals and perceptions from other personality characteristics.[90]

Another concern is that many studies among pregnant women use measures of perceived stress that have not been validated among pregnant women.[78] There are two reasons this is problematic. First, pregnant women are exposed to different and additional types of stressors than non-pregnant women (e.g. travel to many appointments, concern over body appearance, learning of a problematic amniocentesis result). The appraisal and perception of pregnancy-specific stressors may be different than women's appraisal and perception of general life stressors, but both can impact health and wellbeing. Second, women's psychological and physiological responses to stress change during pregnancy,[28,29] and therefore, they may perceive or appraise stressors differently as pregnancy progresses. Thus, the validity of commonly used scales of perceived stress (e.g. the Perceived Stress Scale) may be challenged when used among pregnant women.

Depression and Anxiety

Depression and anxiety are affective responses, or more generally described as moods, which result from subjective experiences (versus moods that are more stable and more reflective of personality traits). In Cohen, Kessler and Gordon's (2004) heuristic model of the pathways through which stress affects health outcomes, affective response results from negative appraisals or perceptions of stress, which subsequently directly affect both behavioral and physiologic responses, and risk for physical and mental disease.[89] Affective states can also be viewed as buffers or enhancers of stress— they can affect the perception and appraisal of stress and people with greater affective responses may be the most vulnerable to negative health outcomes. The most commonly studied affective states in research on stress and birth outcomes are depression and anxiety, which are composed of affective and non-

affective (e.g. feeling tired) components.[78] Among studies of birth outcomes, the Center for Epidemiological Studies Depression Scale (CES-D)[91] is the most common measure of depression and the State-Trait Anxiety Inventory (STAI)[92] is the most common measure of anxiety employed in this research.

Measurement Considerations

Measures of affective response and birth outcomes have almost exclusively focused on the constructs of anxiety and depression, despite affect being composed of a wide range of dimensions, such as sadness, happiness, and calmness.[89] As it stands, there is inconsistent evidence linking psychological constructs (such as depression and anxiety) with birth outcomes,[78] and even less evidence that these constructs mediate or moderate the effect of external stressors on birth outcomes. It is also possible, though not well studied, that certain affective responses are associated with subsequent behavioral and physiological changes that would affect health outcomes.[89] The lack of precision in the measurement of affective responses may contribute to these inconsistent findings.

The severity of affective responses may also affect physiological and behavioral changes, although there has been little attention to the severity of anxiety and depressive symptoms that may be linked to physiological mediators and birth outcomes. While there is a plethora of research on symptoms of anxiety and birth outcomes, there has been very little research on pathological levels of anxiety.[93] Further, anxiety measures developed specifically for use among pregnant women have little theoretical basis and no tests of convergent validity, which is important given the well-documented physiological and psychological changes women experience during pregnancy.[28,29,93]

c. Expectant Adolescents and Young Adults: A Vulnerable Population

While stress is a fact of life that cuts across all populations, stress may have a more substantial effect on certain vulnerable populations. Adolescents and young adults are one such population who may be especially susceptible to the ill effects of stress for several reasons. First, adolescents and young adults are still developing and may lack effective coping skills and resources.[94] Second, pregnancy itself can be a stressor for any expectant parent,[47] but the transition to parenthood may be exceptionally stressful for adolescents because they are concurrently confronting the challenges of parenthood and adolescent development.[95] Pregnancy can also give rise to or exacerbate other stressors that may be more common among adolescents and young adults compared to older expectant parents (e.g. financial concerns for supporting a new baby, relationship problems).[96] Third, during adolescence and young adulthood, social relationships outside of the family, including romantic relationships, become increasingly important.[97] An adolescent's romantic partner plays an important role in the attachment, support, and caregiving behavioral systems.[98] Most expectant adolescents and young adults are involved with the baby's father during pregnancy;[65] however they are still learning to interact with their partner and developing their relationship skills[98] and therefore negotiating this relationship may be a significant source of stress for this population compared to older adults.

There is very little research exploring experiences of young expectant fathers, even though a partner's pregnancy is also a major life transition for expectant fathers. A young man's experiences during his partner's pregnancy may influence his own health and behavior, as well as his pregnant partners' health and behavior, carrying implications for the health and development of their baby. Despite this, the paternal experience during pregnancy, particularly among adolescent and young adult fathers, has largely been ignored in the literature. As described previously in this chapter, when the

father's experience is acknowledged, it is usually reported by the expectant mother, introducing potential measurement error.

d. Romantic Relationship Quality and Birth Outcomes

d.1 The Influence of Relationship Quality on Birth Outcomes

Like stress, relationship quality has been associated with a variety of health outcomes, including cardiovascular disease,[99] inflammation[100] and impaired immune function.[100] It follows that relationship quality may affect reproductive health, including birth outcomes. Pregnancy is a sensitive period characterized by many psychological and physiological changes for the mother, and rapid development of the fetus. Relationship dynamics that buffer, cause or exacerbate stress may have an effect on both maternal and child health.

While there is a large body of research demonstrating the influence of relationships on general health,[58] there is little research examining the link between relationship quality and birth outcomes. Studies have focused on relationship characteristics that are easier to measure, such as marital status. Many studies have shown that married women tend to have better birth outcomes than unmarried women;[101] however, beyond married couples tending to have a higher socioeconomic status, we know little about *how* being married contributes to better birth outcomes.

Two aspects of relationship quality that may be important are support and conflict. Paternal support and involvement during pregnancy, measured by maternal report or other crude measures, has been shown to be associated with greater infant birth weight[68,102,103] and longer gestation.[68,71] Increased father support and involvement may reduce maternal stress[27,75] and influence pregnant women's health

behaviors (e.g. smoking, attending prenatal care appointments),[43,46,68] ultimately influencing birth outcomes. Measures of paternal involvement were consistently related to lower odds of LBW, the infant being small for gestational age (SGA), and more positive maternal prenatal health behaviors in a recent review of seven studies.[68] These studies measured paternal support via crude proxies for involvement, such as inclusion of father's name on birth certificate[104] and whether the father contributes financially during pregnancy.[102]

Conflict is a second dimension of parental relationship quality that could potentially affect birth outcomes through their effects on maternal stress. While social support may buffer the effects of stress on birth outcomes, conflict may cause psychological distress leading to negative health behaviors and/or physiological changes that increase risk for poor birth outcomes.[62] Little research, however, has explored if and how relationship conflict during pregnancy affects birth outcomes.

d.2 Measurement of relationship quality

Most studies of relationships and birth outcomes have used crude measures of relationship characteristics as proxies for relationship quality, including marital status, cohabiting status, father's name on birth certificate, father's presence at the child's birth, etc. These characteristics, however, tell us little about the actual quality of a couple's relationship. Relationship quality is more generally defined as the subjective, global evaluation of a relationship.[105] Measures of relationship quality were developed from research on married couples, but they have since been applied to romantic couples in general. Spanier's Dyadic Adjustment Scale (DAS) is one such measure, which asks respondents to evaluate multiple components of their relationship, which make up four constructs: consensus, satisfaction, cohesion, and affectional expression.[106]

Most often, scores on relationship satisfaction measures, including the DAS, are treated as a unidimensional construct, such that lower scores indicate less relationship quality or satisfaction (note these terms are used interchangeably in the literature) and higher scores indicate more relationship satisfaction.[105] Fincham and Rogge (2010) argue that relationship quality may be more accurately measured by two distinct dimensions: positive and negative relationship qualities.[105] These feelings about a relationship may be experienced independently and each dimension has its own information to contribute to the understanding of a relationship. In parallel, different components of relationship quality may affect health and birth outcomes through different pathways. Social support may affect health by buffering the effects of stress, while conflict may affect health by causing psychological distress, which could lead to negative health behaviors or physiological processes that increase disease risk.[62] Thus assessing both positive and negative perceptions of a relationship may give us more information about how relationships affect health. It is therefore important to measure both positive or supportive aspects of a relationship, such as their partner's encouragement and willingness to compromise, as well as negative or conflicted aspects, such as disagreements about finances, spending time together and sexual relations.

d.3 Paternal reports of relationship quality and their influence on birth outcomes

No studies have examined whether *paternal* reports of relationship quality are associated with birth outcomes. This lack of investigation ignores the possibility that paternal well-being during pregnancy matters to the health of the baby's mother and their child. When measured, relationship characteristics and paternal support are almost always reported in research studies solely by the mother. This approach is problematic for several reasons. First, asking mothers to report their partner's contributions or feelings may introduce measurement error as these are secondhand reports. Maternal

reports of her partner's feelings are likely highly influenced by her own experiences and psychological state, and therefore may differ greatly from her partner's true feelings and behaviors. Second, we are unable to assess whether there is an interactive effect of maternal and paternal reports of relationship quality on birth outcomes—for example, is having both parents report high levels of support from their partner much better than when only the mother reports high levels of support from her partner?

Finally, qualitative research has described how married couples perceive stress in relationships differently than unmarried couples. In one study by Waller,[107] when discussing tensions in their relationships, married couples perceived that conflicts were surmountable, while unmarried couples felt like the conflicts were risks to the stability of their relationship.[107] Couple disagreements or conflict may lead to more stress among unmarried couples than among married couples, and thus the same conflicts may have a different effect on birth outcomes based on the couple's marital status.

e. Approach and Methodological Considerations

Whether stress influences birth outcomes and whether parental relationships influence child outcomes, are interpersonal research questions. As such, these questions require analytical methods that extend beyond measuring individual effects. Observations about one individual also tell us something about other individuals within the social network.[108] For example, we can imagine that an expectant mother's stress is not only driven by her own experiences and characteristics, but also by the experiences and characteristics of individuals that she interacts with, including the father of her baby. Nearly all published research examining the effects of stress on birth outcomes uses reports from the expectant mother alone. A few studies examine the role of paternal support, but either use reports of this support from the mother or use crude measures of paternal support, such as the father's name being on the baby's birth certificate.[68]

Observations of expectant mothers and fathers within a couple (i.e. dyad) are linked and we cannot treat them as independent observations in analyses. This non-independence, or the inherent link between measures in interpersonal research, is the core of dyadic analysis.[108] Non-independence within dyadic data can come from multiple sources. There may be mutual influence, where each individual's outcomes affect one another. There may be a partner effect, where a characteristic or behavior of one individual affects their partner's outcomes. The partners may have a common fate, where both individuals experience the same exposures. Finally, there may be a compositional effect, where the two members of a dyad may have been similar before they paired together (e.g. people tend to have relationships with people who are similar to themselves).[108] Due to the non-independence of dyadic data, the dyad should be the unit of analysis, versus the individual.[108]

Methods such as Generalized Estimating Equations, Multilevel Modeling and Structural Equation Modeling, all used within this dissertation research, can account for this non-independence of data and can be tailored specifically to dyadic data, which has particular specifications due to the low number (two, to be exact) of units within each group.[109] GEE produces population average estimates of an effect of a predictor on the outcomes and accounts for clustering of data within couples.[72] MLM is the most flexible strategy for analyzing dyadic data because it provides direct estimates of actor (effects of someone's report on own outcomes) and partner effect (effect of someone's report on a partner's outcomes) and is able to specify model constraints.[126] SEM simultaneously assesses direct, indirect and total effects of a system of variables on an outcome. SEM can also be tailored to account for clustering of data within couples.[73] This dissertation research employs each of these techniques to account for the dyadic nature of the couple data.

f. Innovation

There are several gaps in the literature that this dissertation seeks to fill. First, this research takes into account paternal effects on birth outcomes among two populations: a national sample of married and unmarried couples and a convenience sample of adolescents and young adults. Second, while epidemiological evidence shows that married women tend to have better birth outcomes, we know little about whether more detailed facets of a parental relationship, such as conflict and support, affect birth outcomes, from a stress pathway approach. Beyond relationship characteristics, very few studies have assessed direct paternal report of their perception of their relationship and whether those reports are associated with birth outcomes. Also, no studies have looked at whether the effect of parental reports of relationship quality on birth outcome differs by marital status. Third, many studies have shown that maternal experiences of stress during pregnancy are associated with negative birth outcomes; however, a woman's relationship with the baby's father likely plays a large role in this stress process. No studies have assessed how paternal stress may impact birth outcomes through potential effects on maternal factors. Fourth, no studies have explored whether experiences of stress can crossover and affect a romantic partner's health behaviors among adolescents and young adults who are expecting a baby.

g. Dissertation Research Overview

This dissertation research aims to assess the association of several dimensions of maternal and paternal stress with PTB and LBW, and the psychosocial pathways through which stress affects these outcomes. From a stress and coping framework, it also aims to assess how relationship quality is associated with PTB and LBW. Building on the conceptual frameworks posed by Dunkel-Schetter and Lobel (2012) and Misra and colleagues (2010), I pose the following conceptual framework for this

dissertation research (Figure I-3).[43,67]

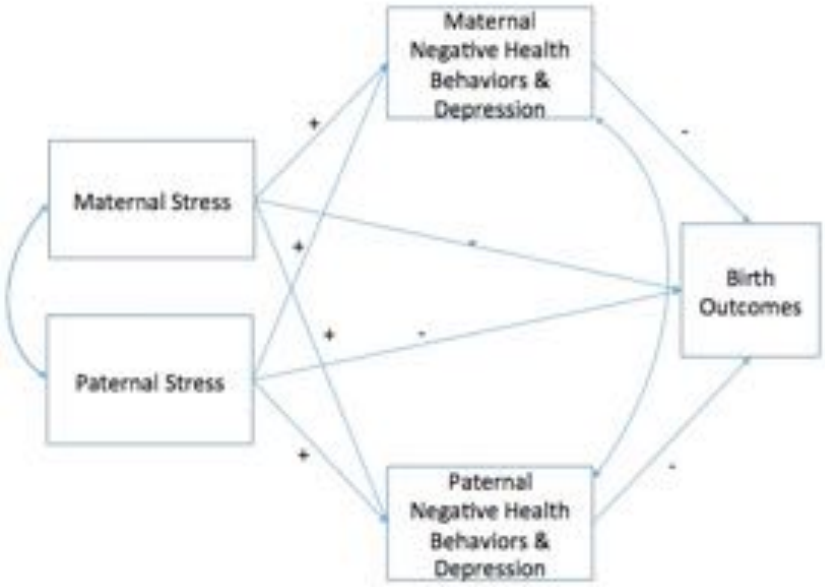

Figure I-3. Proposed conceptual model for the dissertation research assessing the effects of parental stress on birth outcomes and the behavioral and psychological pathways.

This is the first research to assess the effect of direct report of paternal experiences of stress and relationship quality on birth outcomes. It is also the first research of its kind to use dyadic data analysis methods to parcel out the independent and interactive effect of each parent among couples—particularly among young couples who may be susceptible to stress and its effects on birth and child outcomes.

The specific aims and hypotheses of this research are:

Aim 1: Assess the association of maternal and paternal reports of relationship quality with the gestational age at birth and birth weight of their baby among families in the Fragile Families and Child Wellbeing study.

Hypothesis 1.1: Relationship quality factors, such as conflict and partner support, will predict birth weight and gestational age. More conflict and less support will be associated with lower gestational age and birth weight.

Hypothesis 1.2: The association of relationship quality with infant birth weight and gestational age at birth will be moderated by marital and cohabiting status. Factors such as relationship conflict and support will have a stronger association with gestational age and birth weight among unmarried couples compared to married couples.

Aim 2: Investigate the association between maternal and paternal stress during pregnancy with the gestational age at birth and birth weight of their baby among a sample of young couples in southern Connecticut.

Hypothesis 2.1: Greater maternal and paternal self-reported stressors during pregnancy will be associated with lower infant birth weight and gestational age at birth.

Hypothesis 2.2: The association between both maternal and paternal self-reported stressors and infant gestational age at birth and birth weight will be mediated by maternal depressive symptoms.

Hypothesis 2.3: Maternal stress will interact with paternal stress, such that the influence of paternal stress on gestational age at birth and birth weight depends on maternal stress levels.

Aim 3: Investigate the association between maternal and paternal self-reported stress during pregnancy and their own and their partner's poor health behaviors among a sample of young couples in southern Connecticut.

Hypothesis 3.1: Greater maternal and paternal stress during pregnancy will be associated with greater poor health behaviors during pregnancy.

Hypothesis 3.2: Greater *partner's* stress during pregnancy will be associated with greater poor health behaviors.

Chapter II. Parental Reports of Relationship Quality and the Association with Birth Outcomes among Infants in the Fragile Families and Child Wellbeing Study

a. Introduction

Preterm birth (PTB; <37 weeks gestation) and low birth weight (LBW; <2,500 grams) are among the leading causes of infant mortality in the United States (U.S.).[110] Furthermore, infants born preterm and/or with a low birth weight are at increased risk for behavioral and emotional problems during childhood, and chronic health conditions into adulthood, such as asthma, coronary artery disease and type II diabetes.[111,112] In the U.S., 11.4% of infants are born preterm and 8.0% are born with a low birth weight.[39] Beyond the implications for the child's health and development, the costs to the U.S. healthcare system associated with these birth outcomes are staggering. Medical care costs due to PTB alone exceeded $16.8 billion in the U.S. in 2005, a figure that does not include long-term productivity and educational costs to individuals and society as a whole.[113]

Every Healthy People initiative since the program's inception in the 1970s has included the goal of reducing the rates of LBW by improving the population rates of traditional risk factors, such as smoking during pregnancy and access to and use of prenatal care.[4–7] Over the last few decades there have been substantial improvements in the population rates of these traditional risk factors; however, the rates of PTB and LBW continue to remain high. For example, between 1990 and 2002, the rates of preterm birth and LBW in the U.S. each increased by about 15%,[21] while the rates of maternal smoking during pregnancy declined 38% during the same time period.[22] This evidence suggests that there may be other factors, beyond traditional risk factors, that contribute to the risk for PTB and LBW.

Researchers have identified several psychosocial factors that have been linked to the risk for preterm birth and low birth weight, including level of social support.[28,69,70] Lack of social support during pregnancy has been related to stress and anxiety[70,114] and evidence shows that maternal stress during pregnancy is consistently predictive of negative birth outcomes, including PTB[27,28,31–33] and LBW.[27,31,34,35] For example, Feldman and colleagues (2000) demonstrated among a sample of 247 low obstetric risk women of mostly European or Hispanic ethnicity in a structural equation modeling analysis, that a latent

social support factor measured at 28-30 weeks gestation, predicted higher infant birth weight (in grams) adjusted for gestational age, marital status, education, ethnicity and obstetrical risk (standardized adjusted B=0.15; P <0.05).[69]

Romantic relationships are a substantial source of social support as well as stress,[62] and have been shown to influence many health outcomes, including cardiovascular disease,[99] inflammation[100] and immune function.[100] While an increasing number of mothers are not married when their child is born, over 80% of unmarried women are in a relationship with the baby's father during pregnancy.[115] Thus, a woman's male partner—married or not—is usually an important social relationship during pregnancy and he likely has a substantial influence on the health and wellbeing of an expectant mother during this time.

Research has shown that paternal support and involvement during pregnancy is associated with greater infant birth weight[68,102,103] and longer gestation.[68,71] Increased father support and involvement may influence birth outcomes by reducing maternal stress[27,75] and affecting pregnant women's health behaviors (e.g. smoking, attending prenatal care).[43,46,68] A recent review of seven studies found that measures of paternal involvement were consistently related to lower odds of LBW, the infant being small for gestational age (SGA) and more positive maternal prenatal health behaviors.[68] These studies measured paternal support and involvement in different ways, generally using crude proxies for involvement such as inclusion of father's name on birth certificate[104] and whether the father contributes financially during pregnancy.[102]

Paternal support is only part of how relationships can affect birth outcomes. Other dimensions of parental relationship quality, such as conflict, have the capacity to influence birth outcomes through their effects on maternal stress. Conflict may cause psychological distress leading to negative health behaviors and/or physiological changes that increase disease risk, while social support may buffer the effects of stress.[62] Little research, however, has explored if and how different dimensions of parental

relationship quality during pregnancy affect birth outcomes. As described above, studies have focused on relationship characteristics that are easier to measure, such as marital status and whether the father's name was on the birth certificate. We know little about the mechanism by which being married or having the baby's father's name on the birth certificate (beyond their associations with socioeconomic status) leads to better birth outcomes. Relationship quality is a multidimensional construct that includes dimensions such as support and conflict.[116,117] Sources of relationship support may include a partner's encouragement and willingness to compromise, while conflict may include disagreements about finances, spending time together and sexual relations. These dimensions may have unique associations with birth outcomes.

Furthermore, measures of relationship characteristics and paternal support are almost always reported in research studies solely by the mother. This approach is problematic. Asking mothers to report their partner's contributions or feelings may introduce measurement error as these are secondhand reports. We are also unable to assess whether there is an interactive effect of maternal and paternal reports of relationship quality on birth outcomes—for example, is having both parents report high levels of support from their partner much better than when only the mother reports high levels of support from her partner?

In addition, we cannot assume that each facet of relationship quality affects birth outcomes the same way among couples in different types of relationships. Qualitative research has described how married couples perceive stress in relationships differently than unmarried couples. In one study by Waller,[107] when discussing tensions in their relationships, married couples perceived that conflicts were surmountable, while unmarried couples felt like the conflicts were risks to the stability of their relationship.[107] Couple disagreements or conflict may lead to more stress among unmarried couples than among married couples, and thus the same conflicts may have a different effect on birth outcomes based on the couple's marital status.

The Current Study

This study uses data from both maternal and paternal reports among married and unmarried couples in the Fragile Families and Child Well-Being study to, first, explore whether multiple dimensions of parental relationship quality during pregnancy are associated with their baby's birth weight and gestational age at birth. I hypothesize that both maternal and paternal reports of fewer couple activities, more conflict, less partner support and less relationship satisfaction will be associated with lower birth weight and earlier gestational age at birth.

Second, this study aims to look at the interactive effect of maternal and paternal reports of relationship quality on these birth outcomes. I hypothesize that when both parents report high levels of partner support, relationship satisfaction and couple activities there will be greater positive association with birth weight and gestational age than when only the mother reports high levels of these dimensions. I also hypothesize that when both parents report high levels of couple conflict there will be a more negative association with birth weight and gestational age than when only the mother reports high levels of couple conflict.[1]

Third, this study aims to assess whether the association of parental relationship quality with birth outcomes differs among married and unmarried couples. I hypothesize that both maternal and paternal reports of couple conflict will have a greater negative association with birth weight among unmarried couples than among married couples.

[1] An alternative hypothesis could be that the difference between the parents' perception of the relationship that influences maternal stress and, subsequently, birth outcomes. This hypothesis would assume that when the father has a positive perception of the relationship and the mother does not has an equal effect on birth outcomes as when the mother has a positive perception of the relationship and the father does not. This dissertation focuses on the interaction between the maternal and paternal reports of relationship quality based on the perspective that both parents' indication of a poor relationship probably indicated the most troubled relationships with the most stress, and thus these couples will have the worst birth outcomes. This dissertation also takes the perspective that there may be differential effects on birth outcomes depending on which parent reports a negative perception their relationship.

b. Methods

b.1 Data Source

Overview and Sampling

Data for the analyses come from the Fragile Families and Child Well-Being Study (hereon referred to as Fragile Families).[118] IRB approval to use the de-identified Fragile Families survey and medical record data was obtained from the CUNY Graduate Center Human Research Protections Program. The Fragile Families and Child Well-Being Study is an ongoing longitudinal study following a national sample of new parents and their children born between the years 1998 and 2000. The study used a stratified random sample of cities with 200,000 or more people, with hospitals sampled within the cities and births sampled within the hospitals. The cities were stratified according to a scoring system that accounted for variability in the policy environments and labor market conditions within the cities. In several cities, births were sampled from all hospitals; in a few cities, hospitals were excluded for cost and efficiency reasons if the hospital had few births. In New York and Chicago, hospitals with over 1,000 non-marital births per year were randomly selected. Random samples of births were taken within each sampled hospital based on quotas that matched the percent of non-marital births in that city. Please see Reichman et al. (2001) for further details on the sampling strategy.[118]

Participants

Mothers were eligible if they were 18 years or older (in one-third of the hospitals, though, this restriction did not apply and some women under 18 were interviewed), spoke English or Spanish, were not too ill to participate, reported that the father of their new baby was living, were not planning adoption for the baby and the baby did not die before the interview could take place.

The analyses for this aim were based on the national sample of women having a singleton birth and the fathers of the index baby. Couples were included in the analysis if they were in a relationship (reported that they were married, cohabiting or visiting), both the father and mother completed the survey and at least one outcome birth weight and/or gestational age data was available from the medical record abstraction (N=2,622 for birth weight and 2,637 for gestational age). Please see Figure II-1 below for the Data Selection Flow Chart. The data are representative of singleton births occurring in large (>200,000 people) U.S. cities.[118]

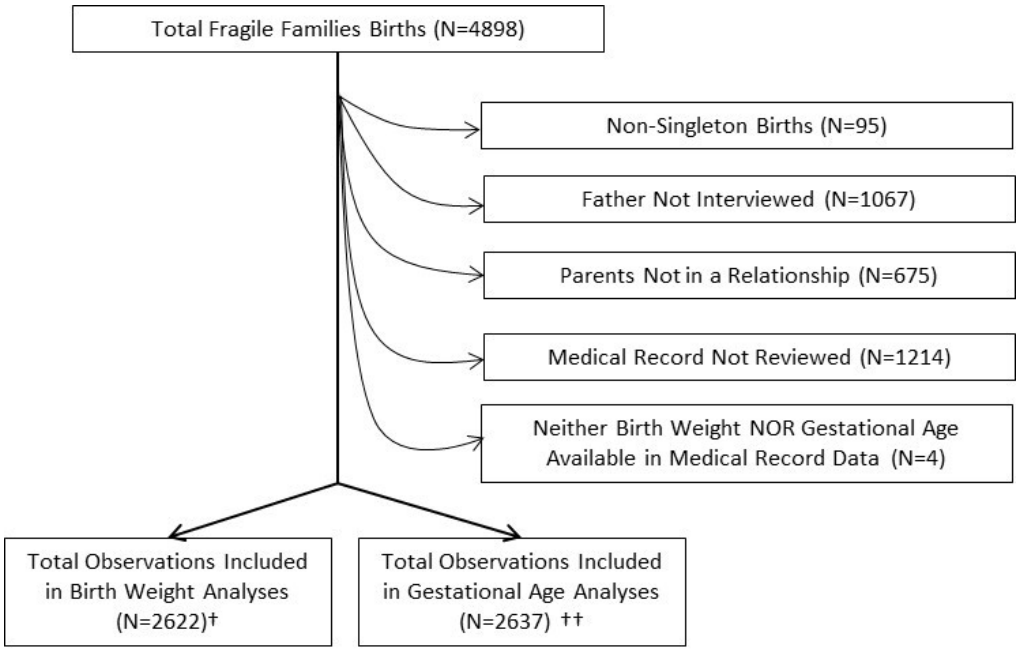

Figure II-1. Data Selection Flow Chart

† 2 of these cases did not have gestational age available †† 17 of these cases did not have birth weight available

Procedures

Parents completed baseline interviews in 75 hospitals or by phone in 20 cities across the U.S. generally within a few days of their child's birth. Mothers and 77% of fathers were interviewed within 7 days of the birth of their baby during the baseline wave of the study between the years of 1998 and 2000. Mothers were interviewed between 0 and 112 days after the birth, with 99% of the interviews

taking place within seven days of the birth. Fathers were interviewed between 0 and 381 days of the birth, with 77% of the interviews taking place within seven days of the birth.[119] Parents were asked by trained interviewers about their health, relationships, employment, finances, and environmental factors.[118]

Trained research staff abstracted birth outcome data from birth hospitalization records for mothers and the focal children. These data were available for 3,684 births. Data for the remaining 1214 births was not available because either 1) the hospital did not grant access to this data or there were too few cases to make it financially feasible (n=461, 38%), 2) the mother refused consent (n=401, 33%) or 3) the records could not be located in the hospital (n=352, 29%).[120] All procedures were approved by the Columbia University and the Princeton University Institutional Review Boards (IRBs), and by IRBs at the participating study hospitals.

b.2 Measures

Please see Appendix II-1 and Appendix II-2 for detailed item descriptions, and estimates on the validity and reliability of the measures used in the analyses for this chapter.

Predictors

All exposure variables were measured at the baseline survey, which occurred, in most cases, within a few days after the baby's birth. Four parent-reported summary measures of relationship quality were included in this analysis: 1) *positive couple activities, 2) couple conflict*, 3) *partner support* and 4) *relationship satisfaction*. Table II-1 shows a detailed description of the relationship quality predictor variables. Reports of positive couple activities and conflict referred to experiences over the previous month. Reports of partner support and relationship satisfaction referenced the current moment in time.

Additionally, two other indicators of relationship quality were included. *The baby's father's presence at the birth* was assessed by asking the baby's father whether he was present at the birth (Yes/No). *Relationship duration* was also assessed by asking women how many years and/or months they knew the baby's father before this pregnancy began.

Table II-1. Descriptive Information about Relationship Quality Predictor Variables

Relationship Quality Predictor	**Measure**	**Description**	**Response Scale**	**Scoring**[a,b,c]
Positive Couple Activities	Original to Fragile Families	4 items asked whether they had done positive activities with baby's father/mother in the **last month** (e.g. visited with friends, helped each other solve a problem)	1=Yes 0=No	-Responses summed to form an index -Higher scores correspond to more positive activities (range: 0-4) (α=0.64 women (w), 0.60 men (m))
Couple Conflict	Adapted from National Survey of Family Health[121]	6 items assessed frequency of disagreements about specific topics in the **last month** (e.g. money, sex, being faithful)	1= never 2= sometimes 3= often	-Responses summed to form a continuous scale -Higher scores correspond to more disagreement/more conflict (range: 6-18) (α=0.65 w, 0.64 m)
Partner Support	Adapted from Multidimensional Support Scale (MDSS)[122,123] and Susan Loyd's Effects of Violence on Work and Family project.	4 items assessed frequency of supportive and destructive behavior toward respondent by the baby's father/mother (e.g., s/he is fair and willing to compromise, s/he insults or criticizes you or your ideas)	1= often 2= sometimes 3= never	-Responses summed to form a continuous scale -Supportive behaviors were reverse scored. -Higher scores correspond to more partner support (range: 4-12) (α=0.60w, 0.59 m)
Relationship Satisfaction	Original to Fragile Families	6 items ask how life might be different if they were married to the baby's father/mother (for unmarried) or not married to the baby's father/mother (for married) (e.g. financial security, happiness)	4-point scale ranging from 5=much worse to 1=much better	-Responses summed to form a continuous scale -Responses from unmarried respondents were reverse scored. -Higher scores correspond to more partner/relationship satisfaction (range: 6-30) (α=0.72 w,0 .67m)
Baby's Father present at birth	--	Asked baby's father whether he was present at the birth	1=Yes 0=No	Dichotomous
Relationship Duration	--	Asked mothers years and/or months they knew the baby's father before the pregnancy	Months	Continuous (range: 0-432)

[a]Chonbach's Alpha (α) were conducted for all variables except a Kuder Richardson (KR-20) test of internal consistency was conducted for positive couple activities. [b]All internal consistency estimates are from this dataset.

[c]"w" stands for estimates among women and "m" stands for estimates among men

Outcomes

The baby's *gestational age at delivery* and *birth weight* were ascertained from the mother's medical record at the birth hospitalization. Gestational age was recorded in weeks and birth weight was recorded in grams.

Covariates

Several confounders were accounted for during model building and are described in detail in Appendix II-1. Demographic confounders included maternal household income,[2] both maternal and paternal age, education and race/ethnicity, and maternal parity, marital status and whether she paid with Medicaid or was otherwise uninsured at the time of delivery.

Other maternal clinical/health confounders included a history of mental health problems before pregnancy, prenatal care, gestational diabetes, pre-eclampsia or eclampsia, obesity during pregnancy, child gender and HIV/STI positive during pregnancy. Due to the low prevalence of HIV in the population, HIV and STIs were combined into one variable to strengthen the model and avoid large confidence limits.

These measures were abstracted from the mother's medical record.

Maternal use of drugs, alcohol and cigarettes during pregnancy (all yes/no) were also accounted for. These measures were abstracted from the mother's medical record.

[2] The question asked both parents, "Thinking about your income and the income of everyone else who lives with you, what was your total household income before taxes in the past 12 months?" Data was collected in categorical form from the respondent and then they were given the mean value for that category. However, about 25% of data was missing. For married and cohabiting couples, the mother's report was used if available, and the father's report was used otherwise. If household income was missing for both parents, the income was imputed using Stata's regression-based impute command. Because this variable is therefore a combination of maternal and paternal reports, only the maternal variable was included in statistical models. Please see "Introduction to the Fragile Families Public Use Data" (2008)[119] for details on the construction of this variable.

Since many of these covariates could also be considered on the pathway between relationship quality and birth outcomes, analyses accounted for the variables in blocks, sequentially. Please see *regression model building* in the Statistical Analysis section below.

Effect Measure Modifier

Marital status (yes/no) was treated as an effect measure modifier with the hypothesis that relationship quality would have a different effect on birth outcomes among married and unmarried couples.

Clustering and Weighting Variables

Due to the sampling procedures described above, descriptive statistics were run using city weights, making the estimates representative of births in the mother's city in the year of the interview.[124] Reliability estimates, correlations and t-tests were not run using any weighting or cluster variables. All regression analyses accounted for city and hospital variables by including these terms in the cluster statement within the SAS procsurvey command instead of using the city weights. Because mothers' and fathers' responses were included within the same model, a variable identifying the couple (ffchid) was also included in the cluster statement. Because unmarried births were oversampled, all analytical models controlled for marital status (coded 0/1) within the regression equation.

b.3 Statistical Analysis

Descriptive Statistics

Descriptive statistics were produced using SAS 9.3 proc freq and proc means commands with city weights applied. All remaining analyses used SAS 9.3 procsurvey commands and accounted for clustering by couple, and marital status, city and hospital due to the sampling scheme. Because the

sampling weights were not a function of the outcomes, unweighted regression estimates that controlled for the clustering variables were preferred because they are less biased, consistent and have smaller standard errors.[125] Procsurvey commands create robust standard errors and therefore the estimates are robust against non-normality.

Reliability estimates were calculated for the relationship quality predictor variables separately among mothers and fathers, and were sufficient for research purposes (Table II-1).

The amount of correlation between the mother's and father's report of the relationship quality predictor variables was also assessed (Table II-2). With the exception of relationship satisfaction, there was a moderate amount of correlation between the predictor variable responses (except a low amount of correlation between reports of relationship satisfaction)[126] among mothers and fathers within couples. Correlation coefficient values corrected for attenuation (by the variable reliability estimates) were also calculated in order to evaluate how highly correlated the scales would be if they were measured without error (Table II-2, columns 3, 5 and 7). These values were calculated for the entire population of interest (columns 2,3), for married (columns 4,5) and unmarried couples (columns 6,7), and for mothers and fathers interviewed within one month of each other (columns 8,9) and not (columns 10,11).

The fact that the corrected coefficients in all cases were higher demonstrates that the correlation of mother and father reports could be even greater if the reliability of the variables were greater. Only positive couple activities reached a fairly high level of correlation (.72) indicating that about half of the variation in scores is shared within couples. Nevertheless, some of the variance in scores is not shared, allowing the assessment of the contribution of each partner's reports of the relationship quality predictor variables. Therefore, all regression models that include both mother's and father's reports account for clustering by couple by including the couple identifier within the cluster statement of the SAS procsurvey command.

To compare the maternal and paternal relationship quality predictor variables, I also ran paired t-tests using the proc surveymeans command as described in Scerbo and Lajiness (2015)[127] to employ the city weights and control for marital status.

I also ran bivariate linear regression models between each predictor variable and each outcome separately using SAS proc surveyreg and employing city weights and controlling for marital status.

Table II-2. Pearson Correlations and Correlations Corrected for Attenuation between maternal and paternal reports of relationship quality among the subpopulation of interest.

	Total		Married		Unmarried		Interviewed within 1 month		Not Interviewed within 1 month	
	r	Corrected r	r	Corrected r	r	Corrected r	r	Corrected r	r	Corrected r
Positive Couple Activities	0.43	0.70	0.40	0.64	0.43	0.69	0.45	0.72	0.34	0.54
Couple Disagreements	0.35	0.54	0.43	0.67	0.31	0.48	0.39	0.60	0.17	0.27
Partner Support Behaviors	0.26	0.44	0.27	0.46	0.25	0.42	0.27	0.46	0.19	0.31
Relationship Satisfaction	0.26	0.37	0.14	0.20	0.10	0.15	0.12	0.17	0.02	0.03

Regression Model Building

Initially, generalized estimating equations (GEE) were employed to account for the correlated nature of the couple reports and, therefore, clustering by couple. Generalized estimating equations can help parcel out the association of each parent's report with the birth outcomes. GEE produces population average estimates of the association of the predictor on the outcomes and accounts for clustering of data within couples.[128] GEE analyses, however, are not particularly amenable to handling

multiple clustering variables. Due to the sampling structure, the analyses needed to account for multiple levels of clustering, including couple, city, hospital and marital status. Therefore, the analyses were also conducted using a random effects model, while accounting for all of the clustering variables. As expected, the effect estimates were the same when employing a random effects model accounting for the clustering variables and GEE. The confidence intervals for estimates created using GEE were only slightly tighter than those of the effects model and the results were substantively the same. Therefore, I present the results from random effects models that account for all clustering variables, which are in effect, more conservative than the GEE models.

To start model building, bivariate associations were examined between each exposure variable (mother and father reports included simultaneously) and each birth outcome separately (birth weight and gestational age) while controlling for marital status.

Next, multivariate linear regression models were tested between all exposure variables and each birth outcome separately, including both mothers' and fathers' reports simultaneously within the models. Covariates were added in blocks in progressively more complex models. Model a included all maternal and paternal relationship quality predictor variables and controlled for marital status. Model b added other maternal and paternal demographic variables. Model c added maternal clinical health variables. Model d added maternal drug use during pregnancy variables.

To ensure that the time difference between the interviews did not have an unexpected effect on the estimates, model d was also run accounting for the time difference between parental interviews (within 1 month of each other vs. not). This variable was not significantly associated with either birth outcome in multivariate models, and the effect sizes and significance testing were not substantively changed with the addition of this variable. All models therefore exclude the time difference between parental interviews variable.

Exploration of the Interaction of Mother's and Father's Relationship Quality Reports

Next, I explored whether maternal and paternal reports had an interactive association with the birth outcomes. I hypothesized that the effect of a negative paternal report of relationship quality would be buffered by the effect of a positive maternal report of relationship quality. I also hypothesized that the greatest negative effect on birth outcomes would be when both parents reported a negative perception of their relationship. Models assessed the statistical interaction between maternal and paternal reports of the relationship quality variables conditioned on the same variables included in the full models (model d).

When there was a significant interaction between maternal and paternal reports on a relationship quality predictor variable (P<.05) I analyzed the effect of maternal report of the relationship quality variable at three levels of paternal report of the relationship quality variables. For example, I explored the estimates of the effect of maternal report of couple conflict on birth weight when the father's report was -1 SD, +1 SD and at the mean of father's report of couple conflict.

First, I plotted the association of the maternal report of a relationship quality predictor with the outcome (birth weight or gestational age) controlling for all covariates at 3 levels of the paternal reports (low: 1 SD below the mean; medium: the mean; high: 1 SD above the mean). Second, I assessed whether the effects of maternal report (controlling for all covariates) at the three levels of the paternal report were significant according to Aiken and West (1991).[129]

Effect Measure Modification by Marital Status

To determine whether the association between relationship quality and birth outcomes differed by marital status, I tested for 2-way interactions between marital status and relationship quality by including interaction terms (e.g. marital status*relationship quality variable for mothers and fathers) in multivariate logistic regression models using the Wald test for product term (a p-value of <0.05

indicating significant interaction). When a significant interaction (P<0.05) was present between a relationship quality predictor variable and marital status, plots were created of the association between the continuous predictor and the birth outcome by marital status. The significance levels of the simple slopes of the regression lines for married and unmarried respondents were determined.

c. Results

c.1 Descriptive Statistics

Demographics

Table II-3 describes the characteristics of the parents included in the sample for this analysis when employing the city weights. The mean birth weight was 3,328.4 grams (95% CI 3268.8, 3387.9) and the mean gestational age at birth was 38.6 weeks (95% CI 38.4, 38.9). The average age of women and men was 27.0 (95% CI 26.3, 27.6) and 29.7 (95% CI 29.1, 30.4), respectively, and 58.5% of parents were married. Women's and men's mean reported household income were just over $43,000. Over half of the participants had a high school degree/equivalent or less education. Most participants were black (30.1% women; 31.9% men) or Hispanic (32.6% women; 37.3% men). Most parents (84.7%) were interviewed within one month of each other.

Behavioral and Clinical Covariates

Cigarette use was somewhat common during pregnancy, with 13.3% of women having smoked at some point during their pregnancy. 8.0% of women had a pre-pregnancy diagnosis of a mental health problem. The vast majority of women started their prenatal care within the first three months of pregnancy (79.0%). Over half of the women received federal or other assistance to pay for the hospital costs associated with their delivery (54.2%). Nearly 12% of women had a sexually transmitted infection (STI) or HIV during their pregnancy.

Table II-3. Descriptive statistics (weighted) for subpopulation used in all analyses (singleton births, parents in a relationship, both the father and mother completed the survey and either or both birth weight and/or gestational age data was available from the medical record abstraction).[3]

Descriptive Statistics (Using city weights)	**MOTHERS**				**FATHERS**			
	Total N	**Mean**	**95% CI**		**Total N**	**Mean**	**95% CI**	
Birth weight (g)	2615	3328.4	3268.8	3387.9				
Gestational Age (weeks)	2630	38.6	38.4	38.9				
Positive Couple Activities	2603	3.2	3.1	3.4	2593	3.2	3.1	3.3
Couple Conflict	2597	8.1	7.9	8.3	2585	8.1	7.9	8.3
Partner Support Behaviors	2480	10.8	10.5	11.0	2470	10.8	10.7	10.9
Relationship Satisfaction	2482	20.3	19.9	20.7	2446	19.9	19.5	20.2
Relationship Duration (mo) Before Preg	2562	78.3	71.4	85.2	2586	78.2	71.4	85.1
Age	2631	27.0	26.5	27.6	2632	29.7	29.1	30.4
Household Income (in thousands)	2632	43.9	38.7	49.1	2632	43.4	39.8	46.9
Parity	2627	1.2	0.9	1.4	2615	1.1	1.0	1.3
	Total N	**%**	**95% CI**		**Total N**	**%**	**95% CI**	
Father Present at Birth	2627	95.7	94.8	96.6	2620	85.8	83.0	88.6
Married	2632	58.5	56.1	60.9				
Parents interviewed w/i 1 wk	2639	80.5	76.6	84.5				
Education	2629				2632			
Less than HS		29.9	25.9	33.8		32.2	28.4	36.0
HS or Equivalent		31.9	27.7	36.2		27.6	22.2	33.1
Some college or tech school		19.3	15.8	22.8		21.2	18.0	24.4
College or Grad School		18.9	15.2	22.7		19.0	14.2	23.7
Payment for Delivery: Medicaid/gov assistance/uninsured	2632	54.2	47.9	60.6				
Race/Ethnicity	2629				2632			
White		30.7	25.0	36.4		24.8	20.0	29.6

[3] Values for N differ for each variable and among men and women because the descriptive statistical analysis used all available data, regardless of whether they had values for all predictor variables and whether it was available for both members of the couple.

Black		30.1	26.9	33.2		31.9	27.6	36.2
Hispanic		32.6	29.1	36.1		37.3	32.6	41.9
Other		6.6	2.6	10.6		6.0	2.8	9.3
Maternal Clinical Health								
Mental Health Problems during preg	2632	8.0	5.7	10.4				
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Trimester PNC Start	2609							
Within 3 mo		79.0	74.6	83.4				
After 3 mo		18.4	15.9	20.9				
Never		2.6	0.0	6.3				
Gestational diabetes	2632	8.0	3.8	12.2				
Pre-Eclampsia/Eclampsia	2632	4.9	2.2	7.6				
Obesity	2632	8.8	5.0	12.5				
STI or HIV during Pregnancy	2632	12.0	9.2	14.8				
Baby Boy	2632	59.0	52.4	65.7				
Maternal Substance Use During Pregnancy								
Cigarettes during pregnancy	2632	13.3	10.9	15.7				
Drugs during pregnancy	2632	4.8	2.7	6.9				
Alcohol during pregnancy	2632	5.8	3.1	8.5				

Relationship Quality Predictors

On average, mothers and fathers reported engaging in three out of four *positive activities* with each other in the previous month. The most common activity reported was helping each other solve a problem (91.4% of mothers and 91.2% of fathers) and the least common activity was going to a movie (66.1% of mothers and 64.0% of fathers).

The most common topic of *couple conflict* was money, with 54.6% of mothers and 51.5% of fathers reporting sometimes or often disagreeing about money in the last month. The second most common topic of conflict was spending time together, with 44.9% of mothers and 46.2% of fathers reporting sometimes or often disagreeing about spending time together in the last month. The least common topic was conflict about drug or alcohol use, with 9.5% of mothers and 10.8% of fathers reporting sometimes or often disagreeing about drug or alcohol use in the last month.

Nineteen percent of mothers and 15.9% percent of fathers reported low *satisfaction with their relationship* (response one standard deviation below the mean or lower). Twenty percent of mothers and 21% of fathers report low *partner support* (response one standard deviation below the mean or lower).

Because one of the aims of the research is to compare effects by marital status, the characteristics of the sample among unmarried and married parents (unweighted) are presented in Table II-4 (mothers) and Table II-5 (fathers). Married couples had babies that were heavier at birth (3,365.8g vs. 3,203.1g) and had a slightly longer gestation (38.8 vs. 38.5 weeks) compared to unmarried couples. Married couples also generally reported more positive responses to the relationship quality variables and fewer clinical health risk factors.

Table II-4. Descriptive characteristics of mothers by marital status (unweighted)

	Mothers							
Descriptive Statistics (Unweighted)	**Married**				**Unmarried**			
	N	**Mean**	**95% CI**		**N**	**Mean**	**95% CI**	
Birth weight (g)	734	3365.8	3322.9	3408.8	1888	3203.1	3175.7	3230.5
Gestational Age (weeks)	739	38.8	38.6	38.9	1898	38.5	38.4	38.6
Positive Couple Activities	732	3.4	3.3	3.5	1878	3.0	2.9	3.0
Couple Conflict	731	7.9	7.8	8.1	1873	8.7	8.6	8.8
Partner Support Behaviors	610	11.0	10.9	11.1	1876	10.7	10.6	10.7
Relationship Satisfaction	676	20.8	20.5	21.1	1813	20.1	20.0	20.3
Relationship Duration (mo) Before Preg	713	90.2	85.6	94.7	1856	47.0	44.8	49.2

Age	739	29.2	28.8	29.6	1899	23.7	23.5	24.0
Household Income (in thousands)	739	56.4	53.4	59.4	1900	25.1	24.0	26.1
Parity	738	1.1	1.1	1.2	1896	1.2	1.1	1.2
	N	**%**	**95% CI**		**N**	**%**	**95% CI**	
Father Present at Birth	722	98.0	96.9	99.0	1707	90.0	88.6	91.3
Parents interviewed w/i 1 wk	644	87.1	84.7	89.6	1471	77.4	75.5	79.3
Education								
Less than HS	139	18.8	16.0	21.6	776	40.9	38.7	43.1
HS or Equivalent	151	20.4	17.5	23.3	638	33.6	31.5	35.8
Some college or tech school	201	27.2	24.0	30.4	429	22.6	20.7	24.5
College or Grad School	248	33.6	30.1	37.0	54	2.8	2.1	3.6
Payment for Delivery: Medicaid/gov assistance/uninsured	235	31.8	28.4	35.2	1431	75.3	73.4	77.3
Race/Ethnicity								
White	289	39.1	35.6	42.6	278	14.7	13.1	16.3
Black	179	24.2	21.1	27.3	993	52.3	50.1	54.6
Hispanic	216	29.2	25.9	32.5	572	30.2	28.1	32.2
Other	55	7.4	5.5	9.3	53	2.8	2.1	3.5
Maternal Clinical Health								
Mental Health Problems dur preg	64	8.7	6.6	10.7	241	12.7	11.2	14.2
Trimester PNC Start								
Within 3 mo	646	89.0	86.7	91.3	1442	76.3	74.4	78.2
After 3 mo	69	9.5	7.4	11.6	403	21.3	19.5	23.2
Never	11	1.5	0.6	2.4	45	2.4	1.7	3.1
Gestational diabetes	51	6.9	5.1	8.7	86	4.5	3.6	5.5
Pre-Eclampsia/Eclampsia	43	5.8	4.1	7.5	95	5.0	4.0	6.0
Obesity	44	6.0	4.2	7.7	186	9.8	8.5	11.1
STI or HIV during Pregnancy	55	7.4	5.5	9.3	377	19.8	18.0	21.6
Baby Boy	390	52.8	49.2	56.4	979	51.5	49.3	53.8
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Maternal Substance Use During Pregnancy								
Cigarettes during pregnancy	62	8.4	6.4	10.4	461	24.3	22.3	26.2
Drugs during pregnancy	19	2.6	1.4	3.7	213	11.2	9.8	12.6

Alcohol during pregnancy	25	3.4	2.1	4.7	147	7.7	6.5	8.9

Table II-5. Descriptive characteristics of fathers by marital status (unweighted).

	Fathers							
Descriptive Statistics (Unweighted)	**Married**				**Unmarried**			
	Total N	**Mean**	**95% CI**		**Total N**	**Mean**	**95% CI**	
Positive Couple Activities	733	3.4	3.3	3.4	1867	3.1	3.0	3.1
Couple Conflict	733	7.9	7.8	8.1	1859	8.7	8.6	8.8
Partner Support Behaviors	615	10.9	10.7	11.0	1862	10.6	10.6	10.7
Relationship Satisfaction	677	19.6	19.4	19.8	1776	20.4	20.2	20.5
Relationship Duration (mo) Before Preg	721	90.8	86.1	95.5	1872	47.1	44.9	49.3
Age	739	31.7	31.2	32.1	1900	26.3	26.0	26.6
Household Income (in thousands)	739	56.4	53.4	59.4	1900	28.8	27.6	29.9
Parity	733	1.2	1.1	1.3	1889	1.1	1.0	1.2
	N	**%**	**95% CI**		**N**	**%**	**95% CI**	
Father Present at Birth	692	93.8	92.0	95.5	1434	75.9	74.0	77.8
Education								
Less than HS	146	19.8	16.9	22.6	747	39.3	37.1	41.5
HS or Equivalent	173	23.4	20.4	26.5	743	39.1	36.9	41.3
Some college or tech school	202	27.3	24.1	30.6	358	18.8	17.1	20.6
College or Grad School	218	29.5	26.2	32.8	52	2.7	2.0	3.5
Race/Ethnicity								
White	286	38.7	35.2	42.2	218	11.5	10.0	12.9
Black	196	26.5	23.3	29.7	1034	54.4	52.2	56.7
Hispanic	208	28.1	24.9	31.4	580	30.5	28.5	32.6
Other	49	6.6	4.8	8.4	68	3.6	2.7	4.4

Table II-6 shows that within couples, mother's and father's reports of relationship quality variables did not differ significantly. Mothers reported marginally more relationship satisfaction than their male partners (P=.06).

Table II-6. Paired T Tests comparing mother's and father's reports of the relationship quality predictors within couples.

	Mean Mother	Mean Fathers	Mean Diff	t	p
Positive Couple Activities	3.24	3.22	0.02	0.28	0.79
Couple Disagreements	8.07	8.07	0.02	0.20	0.85
Partner Support Behaviors	10.77	10.78	-0.02	-0.15	0.89
Relationship Satisfaction	20.33	19.89	0.45	2.12	0.06

Table II-7 shows the correlation matrix between the relationship quality variables among mothers and fathers separately. The highest correlation between variables for both men and women was between couple conflict and partner support (r=-0.42, P<.001 mothers; r=-.03, P<.001 fathers). The higher the conflict reported, the lower the parents' report of their partner's support.

Table II-7. Pearson Correlation matrix of relationship quality variables for mothers and fathers (unweighted).

a. MOTHERS	**Relationship Duration**	**Father at Birth**	**Relationship Sat**	**Partner Support**	**Conflict**
Positive Activities	0.03	0.27***	0.05*	0.27***	-0.09***
Conflict	-0.03	-0.08***	-0.09***	-0.42***	
Partner Support	0.02	0.14***	0.14***		
Relationship Sat	0.06**	0.01			
Father at Birth	0.02				
b. FATHERS	**Relationship Duration**	**Father at Birth**	**Relationship Sat**	**Partner Support**	**Conflict**
Positive Activities	0.01	0.25***	.02	0.22***	-0.07***
Conflict	-0.08***	-0.09***	-0.07***	-0.31***	
Partner Support	0.02	0.11***	0.2***		

Relationship Sat	-0.06**	-.04			
Father at Birth	0.02				

* P<0.05; ** P<0.01; ***P<0.001

Table II-8 shows that among fathers, couple conflict, activities and his presence at birth were significantly associated with both birth weight and the latter two variables were associated with gestational age. Among mothers, however, none of the relationship quality predictor variables were associated with the birth outcomes. Most of the covariates were significantly correlated with both birth outcomes.

Table II-8. Bivariate linear regressions of predictor variables and covariates with birth weight in grams and gestational age in weeks conducted separately among mothers and fathers employing city weight and controlling for marital status.

	Birth weight		**Gestational Age**	
	Mothers	**Fathers**	**Mothers**	**Fathers**
Couple Activities	17.45	22.95 *	0.07	0.09 *
Couple Conflict	-9.83 †	-16.17 **	-0.02	-0.03
Partner Support	7.55	-1.19	0.03	-0.02
Relationship Satisfaction	3.19	-2.33	-0.01	0.00
Relationship Duration	0.31	0.30	0.00	0.00
Father at Birth	58.23	125.52 ***	0.13	0.61 ***
Father's Age		-1.13		-0.02 **
Mother's Age <20	-39.41		0.20 †	
20-34	48.23 †		-0.01	
35+	-48.45		-0.30 †	
HH Income (in thousands)	0.43	0.53	0.00	0.00
Education < HS	9.79	-16.68	0.02	-0.05
HS or Equiv	-69.56 **	-50.46 *	-0.03	-0.11
Some college or tech school	42.61	67.41 *	0.00	0.15
College or Grad School	55.97	46.84	0.06	0.12
Parity	-6.41	-4.31	-0.13 ***	-0.07
Interviewed within 1 week (vs. not)	74.25 *		0.21	*

Paid w/ Medicaid or Uninsured		-93.04 ***		-0.13	
Race	White	65.27 *	54.49 †	0.12	0.11
	Black	-185.49 ***	-182.27 ***	-0.33 ***	-0.37
	Hispanic	151.29 ***	170.69 ***	0.28 **	0.34 ***
	Other	2.11	-16.80	-0.02	0.05 ***
Mental Health Problems		-113.90 **		-0.40 **	
Prenatal Care	Within first 3 months	70.15 *		0.25 *	
	After 3 months	-32.53		-0.09	
	Never	-249.53 *		-1.00 *	
Gestational Diabetes		170.88 **		-0.18	
Pre-eclampsia/Eclampsia		-297.00 ***		-1.13 ***	
Obesity		121.71 *		0.00	
HIV/STI		-128.07 ***		-0.41 **	
Child Gender		75.70 **		-0.03	
Smoking		-208.34 ***		-0.38 **	
Drugs		-211.66 ***		-0.65 ***	
Alcohol		-202.27 ***		-0.63 **	

†=P<0.1; * P<0.05; ** P<0.01; ***P<0.001;

c.2 Linear Regression with Birth Weight and Gestational Age

Relationship Quality and Birth Weight

Base models run separately for each relationship quality predictor variable, but that included both maternal and paternal reports and controlled for couple, city, hospital and marital status, showed that greater paternal report of conflict in the previous month was significantly associated with lower birth weight (B=-15.63 grams; 95% CI -26.28,-4.98)(Table II-9).

Results also showed that babies born to fathers who were present at the birth were on average 125.5 grams (95% CI 59.0, 192.0) heavier than babies born to fathers who were not present at birth. No other maternal or paternal reports of relationship quality predictor variables were significantly associated with birth weight in crude models. As a point of reference, recent studies have estimated that babies born to light smokers during pregnancy are on average 160 grams lighter at birth than

babies born to non-smokers.[130] In this study, the full regression model shows that babies born to smokers were also, on average, 162.60 grams lighter than babies born to non-smokers (Table II-11).

Table II-9. Bivariate linear regression models for birth weight. Models a-f were run separately for each relationship quality predictor variable, with both mother's and father's reports within the same model.

Model N	Birth Weight	B	95% CI	
a	**Positive Couple Activities**			
N=2556	Women	8.71	-15.56	32.98
	Men	18.21	-5.64	42.06
b	**Couple Conflict**			
N-2544	Women	-4.67	-16.40	7.06
	Men	-15.63**	-26.28	-4.98
c	**Partner Support**			
N=2429	Women	7.73	-11.33	26.79
	Men	-5.24	-23.63	13.15
d	**Relationship Satisfaction**			
N=2309	Women	2.51	-5.62	10.63
	Men	-1.76	-9.59	6.06
e	**Baby's Father at Birth**			
N=2610		125.51***	59.03	191.99
f	**Relationship Duration (mo)**			
N=2553		0.31	-0.15	0.76

** P<0.01; ***P<0.001

Relationship Quality and Gestational Age

In base models with gestational age as the outcome that included both maternal and paternal reports, the only relationship quality predictor variable that was significantly associated with gestational age at birth was the baby's father's presence at the birth (Table II-10). Babies born to fathers who were present at the birth were born, on average, 0.61 weeks (4.27 days) later than babies whose father was

not present at the birth (B=0.61; 95% CI 0.34, 0.88). As a point of reference, in this study, the full regression model (model d) shows that babies born to non-smokers were, on average, born nearly 1 day later than smokers (Table II-12).

Table II-10. Bivariate linear regression models for gestational age. Models a-f were run separately for each relationship quality predictor variable, with both mother's and father's reports within the same model.

Model N	Gestational Age	B	95% CI	
a	**Positive Couple Activities**			
N=2571	Women	0.04	-0.06	0.13
	Men	0.07	-0.02	0.16
b	**Couple Conflict**			
N=2558	Women	-0.01	-0.05	0.04
	Men	-0.04	-0.08	0.01
c	**Partner Support**			
N=2682	Women	0.03	-0.04	0.11
	Men	-0.04	-0.11	0.03
d	**Relationship Satisfaction**			
N=2321	Women	-0.01	-0.04	0.02
	Men	-0.01	-0.04	0.03
e	**Baby's Father at Birth**			
N=2625		0.61***	0.34	0.88
f	**Relationship Duration (mo)**			
N=2567		0.00	0.00	0.00

***P<0.001

c.3 Multivariate Linear Regression with Birth Weight and Gestational Age

Relationship Quality and Birth Weight

Multivariate models that included all of the maternal and paternal reports of the relationship quality predictor variables, and added confounders in a hierarchical fashion showed results similar to

the results described above in the simpler base models (Table II-11, models a-d). In the final model (model d), which included all covariates, father's presence at the birth (B= 98.81, 95% CI 21.58, 176.04) was significantly associated with birth weight when controlling for marital status, city, hospital, couple, maternal and paternal demographics, maternal clinical health and maternal substance use during pregnancy (Table II-11, model d). The coefficient for father's presence at birth was reduced by 32.19 grams once all variables were added to the model, but remained statistically significant. This suggests that the confounders and the potential mediators (e.g. smoking) account for much, but not all of the association of the father's presence at birth with birth weight. With the addition of maternal substance use during pregnancy (models c to d), which could also be considered mediators as substance use may result from high levels of stress, the coefficient of the effect of father's presence at the birth changed by 0.20 grams, or 0.2%.

Paternal report of conflict remained marginally significantly associated with birth weight (B=11.54; 95% CI -23.54, 0.47) in the final model accounting for maternal and paternal demographics, maternal clinical/health and maternal substance use during pregnancy. With the addition of maternal substance use during pregnancy (models c to d), the coefficient of paternal report of conflict became marginally significant, but was reduced by only 0.91 grams, or 7%. Thus, it is unlikely that maternal substance use during pregnancy was a strong mediator in this analysis.

Relationship Quality and Gestational Age

In multivariate models, paternal report of conflict (B= -0.05; 95% CI 0.11,-0.002) and father's presence at the birth (B= 0.51; 95% CI 0.19, 0.83) were significantly associated with gestational age at birth when controlling for all covariates (Table II-12, model d). The coefficient for father's report of conflict remained virtually unchanged with the addition of control variables (from -0.06 in model a to

-0.05 in model d), suggesting that neither the confounders nor the potential mediators account for the association between father's report of conflict and gestational age at birth.

The coefficient for the father's presence at the birth was reduced the most with the addition of maternal and paternal demographic variables (from 0.63 in model a to 0.56 in model b) and only slightly reduced with the addition of maternal clinical health indicators and pregnancy substance use (0.51 in model d). The addition of maternal substance use during pregnancy (model c to d) did not change the coefficient of the association of the father's presence at birth with gestational age. Thus, it is unlikely that maternal substance use during pregnancy was a strong mediator in this analysis.

Table II-11. Multivariate linear regression models predicting birth weight (grams)

Outcome: Birth Weight (g)	**Model a** N=2068				**Model b** N=2063				**Model c** N=2063				**Model d** N=2063			
	B		95% CI		B		95% CI		B		95% CI		B		95% CI	
Positive Couple Activities																
Mother	10.25		-18.31	38.81	1.73		-26.69	30.14	2.68		-25.35	30.70	4.65		-23.00	32.29
Father	12.56		-15.73	40.85	-0.36		-28.76	28.04	2.35		-25.73	30.42	4.01		-23.99	32.01
Couple Conflict																
Mother	-6.16		-19.96	7.64	-3.12		-16.99	10.75	-2.59		-16.48	11.29	0.10		-13.93	14.13
Father	**-16.99**	**	**-29.18**	**-4.79**	**-13.69**	*	**-25.78**	**-1.6**	**-12.45**	*	**-24.51**	**-0.40**	**-11.54**	t	**-23.54**	**0.47**
Partner Support																
Mother	-1.87		-25.69	21.96	-5.68		-29.52	18.16	-6.52		-30.21	17.18	-6.09		-29.55	17.38
Father	-18.87	t	-40.88	3.14	-17.23		-39.27	4.82	-19.12	t	-40.73	2.49	-20.85	t	-42.30	0.61
Relationship Satisfaction																
Mother	0.55		-8.09	9.19	1.56		-6.94	10.05	1.44		-7.02	9.90	0.87		-7.48	9.22
Father	-1.23		-9.59	7.14	0.34		-7.95	8.63	0.12		-8.12	8.37	0.15		-8.05	8.36
Baby's Father at Birth	**131.00**	**	**51.75**	**210.26**	**110.74**	**	**31.97**	**189.5**	**99.01**	**	**20.94**	**177.08**	**98.81**	*	**21.58**	**176.04**
Relationship Duration (mo)	0.49	t	-0.03	1.02	0.58	*	0.05	1.12	0.47	t	-0.07	1.01	0.41		-0.13	0.94
Maternal Demographics																
Married	95.65	**	32.02	159.27	17.70		-54.00	89.4	27.66		-43.36	98.68	8.65		-62.17	79.46
Age (ref: 20-34)																
<20					-27.12		-101.36	47.12	-10.80		-85.72	64.13	-13.35		-87.35	60.64

35+					-93.26	t	-203.15	16.62	-83.86		-192.39	24.67	-73.79		-180.34	32.75
HH Income (in thousands)					-1.20		-2.83	0.42	-1.13		-2.74	0.48	-1.19		-2.79	0.42
Education (ref: less than HS)																
HS or Equivalent					-22.45		-92.73	47.83	-33.03		-103.70	37.65	-37.32		-106.97	32.32
Some college or tech school					20.52		-62.85	103.89	9.82		-73.49	93.14	-2.10		-84.31	80.11
College or Grad School					53.56		-78.98	186.1	48.14		-83.94	180.22	20.82		-109.85	151.49
Parity					15.18		-8.05	38.41	16.82		-6.10	39.74	18.85		-4.23	41.93
Continued from previous page																
Paid w/ Medicaid or Uninsured					-92.27	**	-155.11	-29.42	-65.80	*	-128.21	-3.39	-64.69	*	-127.12	-2.26
Race/Ethnicity (ref: white)																
Black					-85.26		-222.37	51.85	-97.36		-236.43	41.72	-123.51	t	-264.36	17.34
Hispanic					29.78		-78.98	138.54	23.95		-85.68	133.58	-13.88		-123.02	95.27
Other					-83.58		-240.92	73.75	-121.93		-277.63	33.77	-149.43	t	-308.36	9.51
Paternal Demographics																
Age					-3.47		-8.81	1.87	-3.39		-8.58	1.80	-1.73		-6.92	3.47
HH Income (in thousands)					0.82		-0.78	2.43	0.79		-0.77	2.36	0.74		-0.83	2.31
Education (ref:less than HS)																
HS or Equiv					47.04		-19.22	113.31	43.56		-22.36	109.48	31.00		-35.15	97.15
Some college or tech school					132.48	**	47.67	217.3	132.99	**	49.41	216.57	119.90	**	36.76	203.04
College or Grad School					119.46	*	1.54	237.37	122.39	*	6.04	238.73	88.35		-27.92	204.62
Race/Ethnicity (ref: white)																
Black					-56.58		-198.63	85.46	-55.29		-198.09	87.51	-63.85		-206.47	78.77
Hispanic					66.08		-49.88	182.04	57.33		-60.29	174.94	41.05		-74.99	157.09
Other					-27.43		-196.05	141.19	-3.25		-171.03	164.53	-12.73		-182.69	157.22
Maternal Clinical Health																
Mental Health Problems									-73.38		-161.72	14.97	-8.10		-100.00	83.81

Prenatal Care (ref: w/I first 3 mo)																
After 3 months									-43.23		-110.99	24.52	-23.25		-89.36	42.87
Never									-97.71		-264.03	68.60	-81.34		-245.05	82.36
Gestational Diabetes									129.62	*	12.72	246.52	110.85	t	-6.78	228.48
Pre-eclampsia/Eclampsia									-315.96	***	-472.14	-159.79	-329.74	***	-483.68	-175.80
Obesity									140.85	**	37.95	243.75	144.87	**	41.77	247.98
HIV/STI									-32.78		-106.64	41.07	-28.26		-101.71	45.18
Child Gender									71.39	**	21.49	121.29	71.34	**	21.75	120.92
Maternal Pregnancy Substance Use																
Smoking													-162.60	***	-234.49	-90.71
Drugs													-52.42		-153.20	48.36
Alcohol													-88.71		-215.56	38.15

All models account for marital status, city, hospital and couple in the cluster statement

* P<0.05; ** P<0.01; ***P<0.001

Table II-12. Multivariate linear regression models predicting gestational age (weeks)

Outcome: Gestational Age (w)

	Model a N=2077				**Model b** N=2072				**Model c** N=2072				**Model d** N=2072			
	B		95% CI		B		95% CI		B		95% CI		B		95% CI	
Positive Couple Activities																
Mother	0.04		-0.08	0.15	0.00		-0.11	0.12	-0.01		-0.12	0.11	-0.01		-0.12	0.11
Father	0.03		-0.08	0.14	0.00		-0.11	0.11	0.00		-0.11	0.11	0.01		-0.10	0.12
Couple Conflict																
Mother	-0.01		-0.07	0.05	0.00		-0.06	0.06	0.01		-0.05	0.06	0.01		-0.05	0.07

Father	**-0.06**	*	**-0.11**	**-0.01**	**-0.06**	*	**-0.11**	**-0.01**	**-0.06**	*	**-0.11**	**0.00**	**-0.05**	*	**-0.11**	**0.00**
Partner Support															
Mother	-0.03		-0.12	0.07	-0.04		-0.14	0.06	-0.03		-0.13	0.07	-0.03		-0.13	0.07
Father	-0.04		-0.12	0.05	-0.04		-0.12	0.05	-0.05		-0.13	0.04	-0.05		-0.14	0.03
Relationship Satisfaction															
Mother	-0.01		-0.05	0.02	-0.01		-0.05	0.02	-0.01		-0.04	0.02	-0.01		-0.04	0.02
Father	-0.01		-0.04	0.02	-0.01		-0.04	0.03	-0.01		-0.04	0.03	-0.01		-0.04	0.03
Baby's Father at Birth	**0.63**	***	**0.30**	**0.96**	**0.56**	***	**0.23**	**0.89**	**0.51**	**	**0.19**	**0.84**	**0.51**	**	**0.19**	**0.83**
Relationship Duration (mo)	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00
Maternal Demographics															
Married	0.09		-0.15	0.32	-0.01		-0.29	0.26	0.03		-0.24	0.30	0.00		-0.27	0.27
Age (ref: 20-34)															
<20					0.12		-0.18	0.41	0.15		-0.15	0.45	0.15		-0.15	0.44
35+					-0.07		-0.48	0.35	-0.02		-0.42	0.39	0.01		-0.39	0.41
HH Income (in thousands)					0.00		-0.01	0.01	0.00		-0.01	0.01	0.00		-0.01	0.01

Education (ref: less than HS)																
HS or Equivalent					0.12		-0.16	0.40	0.08		-0.20	0.36	0.08		-0.20	0.36
Some college or tech school					0.07		-0.26	0.40	0.04		-0.29	0.37	0.03		-0.30	0.36
College or Grad School					0.09		-0.42	0.60	0.05		-0.45	0.56	0.02		-0.48	0.53
Parity					-0.04		-0.14	0.05	-0.05		-0.15	0.04	-0.05		-0.14	0.04
Paid w/ Medicaid or was Uninsured					-0.16		-0.40	0.08	-0.10		-0.34	0.15	-0.09		-0.34	0.15
Continued from previous page																
Race/Ethnicity (ref: white)																
Black					-0.04		-0.57	0.49	-0.01		-0.55	0.52	-0.02		-0.56	0.53
Hispanic					0.06		-0.38	0.49	0.06		-0.38	0.50	0.03		-0.41	0.48
Other					-0.23		-0.73	0.27	-0.33		-0.84	0.18	-0.36		-0.88	0.15
Paternal Demographics																
Age					-0.02		-0.04	0.01	-0.01		-0.03	0.01	-0.01		-0.03	0.01
HH Income (in thousands)					0.00		-0.01	0.01	0.00		-0.01	0.01	0.00		-0.01	0.01
Education (ref:less than HS)																
HS or Equivalent					0.14		-0.12	0.41	0.15		-0.12	0.41	0.12		-0.16	0.39
Some college or tech school					0.36	*	0.03	0.70	0.35	*	0.02	0.69	0.32	t	-0.02	0.65
College or Grad School					0.41	t	-0.03	0.84	0.39	t	-0.04	0.82	0.33		-0.11	0.77
Race/Ethnicity (ref: white)																
Black					-0.13		-0.67	0.41	-0.14		-0.69	0.40	-0.17		-0.72	0.37
Hispanic					0.16		-0.30	0.61	0.13		-0.33	0.59	0.09		-0.37	0.55

Other					-0.03		-0.62	0.56	0.04		-0.55	0.63	0.02		-0.58	0.61
Maternal Clinical Health																
Mental Health Problems									-0.18		-0.52	0.17	-0.02		-0.39	0.35
Prenatal Care (ref: w/I first 3 mo)																
After 3 months									-0.05		-0.33	0.23	-0.01		-0.28	0.26
Never									-0.34		-1.23	0.55	-0.32		-1.20	0.57
Gestational Diabetes									-0.12		-0.50	0.25	-0.15		-0.52	0.22
Pre-eclampsia/Eclampsia									-1.31	***	-1.91	-0.70	-1.32	***	-1.92	-0.72
Obesity									0.13		-0.29	0.55	0.14		-0.28	0.56
HIV/STI									-0.33	*	-0.64	-0.02	-0.32	*	-0.63	-0.01
Child Gender									-0.04		-0.24	0.16	-0.04		-0.24	0.16
Maternal Pregnancy Substance Use																
Smoking													-0.14		-0.43	0.15
Drugs													-0.26		-0.68	0.17
Alcohol													-0.39		-0.89	0.10

All models account for marital status, city, hospital and couple in the cluster statement

* P<0.05; ** P<0.01; ***P<0.001

d.4 Interaction of Parental Reports

There were significant interactions between maternal and paternal reports of couple conflict in the association with birth weight (P=.01). No other interaction terms were significant at the P<0.05 level.

As shown in Figure II-2, I further explored the association between paternal reports of couple conflict with birth weight at three levels of maternal report of couple conflict controlling for all variables in the full model (model d): low: 1 SD below the mean; medium: the mean; high: 1 SD above the mean using Aiken and West (1991) as a guide.[129]

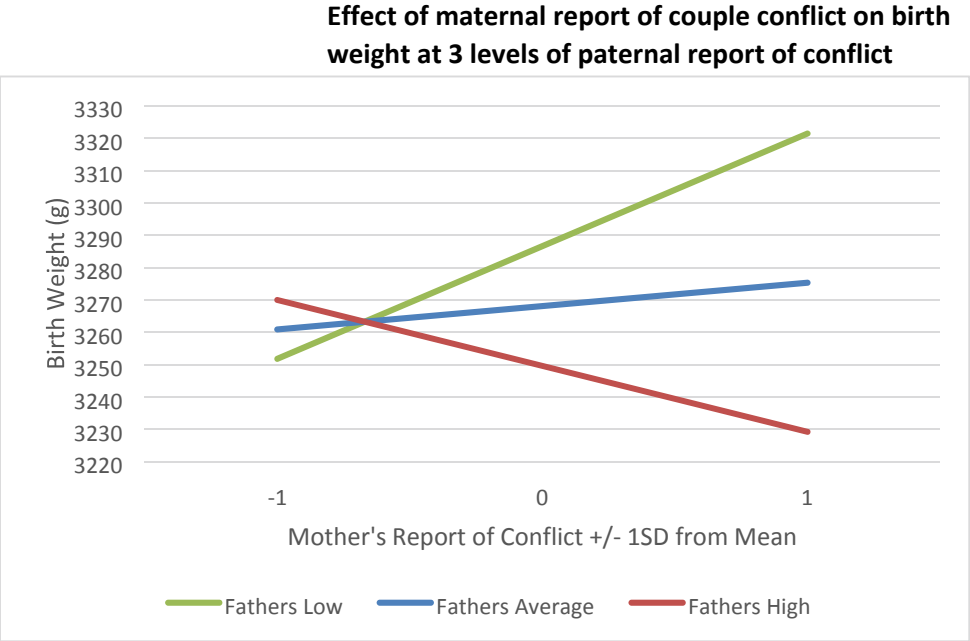

Figure II-2. Association between maternal report of couple conflict and birth weight at three levels of paternal report of couple conflict: low: 1 SD below the mean; medium: the mean; high: 1 SD above the mean.

d.5 Effect Measure Modification by Marital Status

There was a significant interaction between paternal report of couple conflict and marital status in the association with birth weight (B=27.27, 95% CI 1.08, 53.46, P=.04). When looking at simple slopes, among unmarried fathers, those who reported greater couple conflict had babies with lower birth weight on average (B=-14.92, 95% CI -28.24, -1.61, P=.03). The association between paternal report of couple conflict and birth weight was not significant among married fathers (Figure II-3).

To explore whether the association of paternal report of conflict with birth weight among unmarried men was driven by unmarried men reporting higher average levels of conflict, I added the interaction term between marital status and father's report of conflict into the interaction model with maternal and paternal report of couple conflict (section d.4). The interaction between maternal and paternal report of couple conflict remained significant, the effect size did not change substantially and the interaction between paternal report of conflict and marital status was not significant. This result suggests that the association between paternal report of conflict and birth weight is not driven by unmarried men reporting higher average conflict.

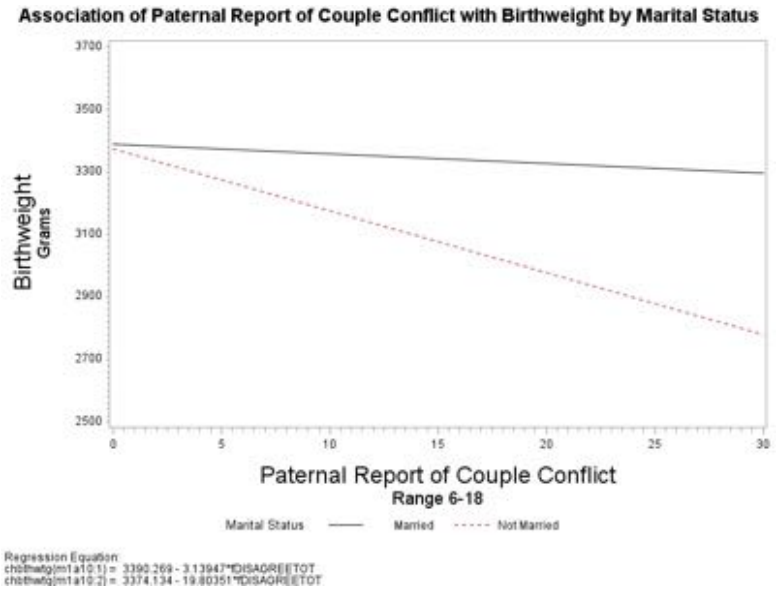

Figure II-3. Effect measure modification of the association between paternal report of couple conflict and birth weight by marital status.

The interactions between marital status and maternal and paternal reports of conflict in the association with gestational age were not significant.

There was a significant interaction between relationship duration and marital status in the association with birth weight (B=-1.07, 95% CI -2.10, -0.04, P=.04). When looking at simple slopes, among unmarried couples, those who reported greater relationship duration had babies with greater birth weight on average (B=0.75, 95% CI .08, 1.42, P=0.03). The association between relationship duration and birth weight was not significant among married couples (Figure II-4).

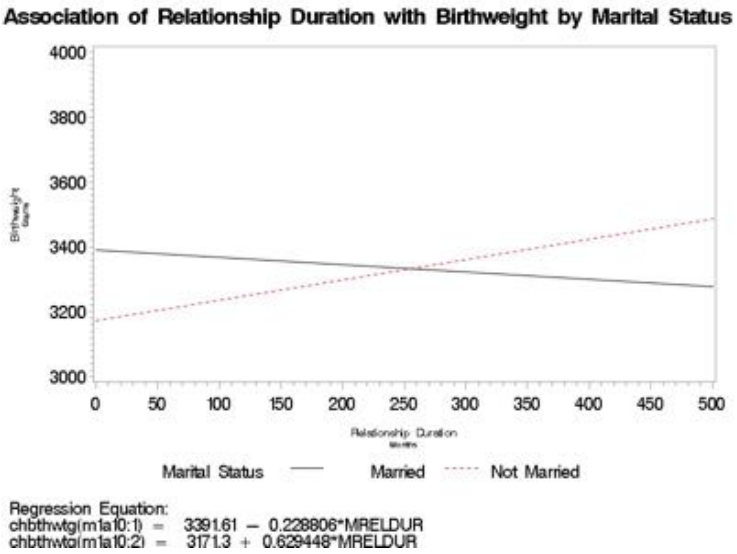

Figure II-4. Effect measure modification of the association relationship duration and birth weight by marital status.

Marital status did not interact significantly with any other relationship quality predictor variables when predicting birth weight.

Marital status did not interact significantly with any relationship quality variables when predicting gestational age at birth.

d. Discussion

Among this national sample of married and unmarried parents in a relationship, the father's report of conflict with his partner over the previous month and the father's presence at birth were both significantly associated with having a baby with a lower birth weight and an earlier gestational age at birth after controlling for maternal and paternal demographic factors, maternal pregnancy clinical health and maternal substance use during pregnancy. The effect sizes of findings were substantial. Babies born to fathers who fell into the highest quartile of conflict were 69.68 grams lighter than babies born to fathers who fell into the lowest quartile of conflict after controlling for all covariates. Additionally, babies born to fathers who were not present at the birth were nearly 99 grams lighter after controlling for all covariates. Estimates show that babies born to *light* smokers during pregnancy are on average 160 grams lighter at birth than babies born to non-smokers. Therefore, these effect sizes are not neglegible.[130]

Conflict in a relationship and the association with birth outcomes

Conflict in a romantic relationship can cause serious stress among both members of an expectant couple and the evidence from this study supports the hypothesis that this conflict can have a deleterious effect on two important birth outcomes: birth weight and gestational age. A plethora of studies have shown that women's experiences of stress during pregnancy are associated with PTB[27,28,31–33] and LBW.[27,31,34,35] The findings from the current research show that men's experiences of conflict within a relationship have a significant association with negative birth outcomes, suggesting that men's experiences and feelings when they are expecting a baby may have a unique contribution to birth outcomes.

Recent evidence has demonstrated that elevated levels of stress hormones, such as cortisol, among pregnant women are associated with lower birth weight[131] and lower gestational age at birth.[132]

A recent study by Feinberg and colleagues (2013), however, showed that salivary cortisol levels were elevated among both partners in an expecting couple in response to conflict within their relationship. Emotional contagion research has shown that feelings and emotions among members of a romantic couple tend to spill-over from one member of the couple to the other.[133] Thus, men's and women's stress reactions may converge and ultimately have an interactive effect on birth outcomes. Consistent with this research, the results of the interaction between maternal and paternal reports of conflict suggest that the average birth weight was the lowest when both parents reported high levels of conflict with their partner. Further, the results suggest that the mother's report of conflict is protective--when mothers perceived low levels of conflict, the father's report of conflict did not have an association with birth weight; however, when mothers reported high levels of conflict, the greater the father's the report of conflict the worse it was for the baby.

Differences in the association of relationship quality with birth outcomes by marital status

Many studies have demonstrated that babies born to married parents, on average, have greater birth weight and a longer gestation compared to babies born to unmarried parents.[66] We know little, however, beyond associated socioeconomic status, about what about being unmarried or married affects birth outcomes. The results from this study show that paternal reports of conflict were only significantly predictive of lower birth weight among *unmarried* fathers. This finding is consistent with previous qualitative research showing that married and unmarried couples perceive tensions in their relationship differently. Waller (2008) found that unmarried couples felt tensions were a greater risk to the stability of their relationship.[107] Conflict in a relationship is a fact of life; however, the results of this study may suggest that couple conflict may cause more stress among unmarried couples than married couples, and therefore have a more negative association with birth outcomes among unmarried couples.

In addition, relationship duration was only predictive of greater birth weight among *unmarried* couples in this study. It is possible that being married is a useful indicator of a committed relationship with more resources to support a healthy pregnancy; however the story is more nuanced among unmarried couples where the duration of the relationship may matter more. This finding may suggest that among unmarried couples, those who have been in a relationship longer may have developed healthier relationships (e.g. better ways to deal with conflict) that can support a healthier pregnancy than unmarried couples who have known each other for a shorter period of time.

The association of the baby's father's presence at birth with birth outcomes

In the current study, the baby's father's presence at the birth was significantly associated with both the baby's birth weight and gestational age at birth among married and unmarried couples alike. In fact, the magnitude of the association with birth weight is similar to the effect of light smoking during pregnancy on birth weight.[130] Whether the baby's father was present at the birth may be a useful way to discern between pregnancies that are more at risk for negative birth outcomes (and potentially poor child health outcomes later). The baby's father's presence at the birth may be a marker of the father's involvement and support, both material and emotional, during the pregnancy. As theorized by Alio et al (2010), support from the baby's father during pregnancy may decrease maternal stress and encourage healthy behaviors, ultimately leading to better birth outcomes.[68]

A study by Teitler (2001) among unmarried couples only within the Fragile Families study, however, did not find that the father's presence at the hospital for the baby's birth or visited around that time was associated with the risk for low birth weight.[103] Teitler (2001) did find that the father's presence at the birth had a positive association with maternal health behaviors, however.[103] Thus, this study is unique in that it found a significant association between the baby's father's presence at the birth and both birth weight and gestational age among the Fragile Families population after controlling

for maternal and paternal demographics, and maternal clinical health and substance use during pregnancy. The differences between Teitler's (2001) findings and the findings in this study are likely due to the fact that 1) Teitler's analysis only included unmarried couples, while this analysis uses all couples in a relationship; 2) Teitler used a dichotomous measure of low birth weight, while this study looked at the continuous forms of birth weight and gestational age abstracted from the medical record and 3) Teitler used the mother's report of whether the father was present at the birth, whereas this study uses the father's report of his own actions (though Teitler reports that the results were substantively the same using father report).

Limitations

While this study has many strengths, it is not without limitations. This secondary data analysis is limited by the study design and the measures collected. The timing of assessments is of some concern. Parents' report of their relationship quality was assessed shortly after the birth of their baby, raising concern over the issue of reverse causality. It is possible, though unlikely, that having a child born with a low birth weight or too early could cause parents to reflect more negatively about their relationship with their partner due to the stress that they are under. In addition, the fathers and mothers were not always interviewed on the same day, thus their perspectives on their relationship may differ due to the elapsed time and events that may have occurred within this time, rather than true differences in how they perceived their relationship quality. A sensitivity analysis was conducted comparing the results among couples that were interviewed within one month of each other versus the more than one week, and the results among the two groups were substantively the same.

As with all observational studies, there could be important omitted confounders that could explain the relationship between relationship quality factors and the birth outcomes. Unfortunately, due the limitations of the study design and measures collected, we cannot parcel out unmeasured

confounding of the association between relationship quality and birth outcomes by some other parental characteristic (e.g. personality, depression) that would affect both the exposure and outcome. Future studies would be strengthened by abstracting birth outcomes from medical records, measuring reports of relationship quality at multiple time points during pregnancy, and measuring other personality and affect variables during pregnancy. This study would also be strengthened by the inclusion of a partner support variable that had higher reliability,

Strengths

Despite these limitations, this study provides an expanded and more comprehensive assessment of relationship quality and its association with birth outcomes compared to previous studies which have been limited to assessing paternal social support, markers of paternal involvement (e.g. father's name on birth certificate, paternal financial contributions) and intimate partner violence.[68,71,103,134] The addition of a single-item maternal report of being a victim of physical abuse by the baby's father was added to the full models assessing the associations between all relationship quality predictors and each birth outcome; however the effect estimates were unchanged.

This study also included direct report of relationship quality from the fathers, while most studies use reports only from mothers, and included both maternal and paternal reports within the same statistical model while accounting for clustering by couple. This study was thereby able to show that men's experiences and feelings when they are expecting a baby may have a unique contribution to poor birth outcomes—something that no other study has done.

Implications for Future Research and practice

This study suggests that dimensions of relationship quality, and most saliently couple conflict and the baby's father's absence at the birth, are associated with birth outcomes at a level that is nearly commensurate with the effect of light smoking on birth outcomes. Further, in this study, men's report of his experiences of conflict were associated with birth outcomes while the mother's reports acted only in concert with her partner's report. Our nation has spent the last several decades focusing on changing maternal behaviors (e.g. smoking during pregnancy and attending prenatal care) to improve population rates of low birth weight and preterm birth with little luck. Programs and policies that not only address the importance of healthy romantic relationships, but that also include both members of an expectant couple, may help support healthier pregnancies and improve the rates of negative birth outcomes.

Chapter III. Parental Stress during Pregnancy and Birth Outcomes among Children in the Parenting and Relationship Transition and Risk Study

a. Introduction

Preterm birth (PTB; <37 weeks gestation) and low birth weight (LBW; <2,500 grams) are leading causes of infant mortality in the United States (U.S.)[110] and infants born pre-term and/or with a LBW are at increased risk for negative health and developmental issues as they grow.[111,112] Of all infants born in the U.S., 11.3% are born preterm and 8.0% are born with a low birth weight.[39] Among teens aged 15-

19, the rates of PTB and LBW are even higher at 13.0% and 9.3% respectively.[39] Among babies born to 15 year olds, 17.3% are born preterm and 10.2% have a low birth weight.[39] The higher rates of these adverse birth outcomes among teens has been attributed to maternal risk factors associated with teenage pregnancy, such as low socioeconomic status, minority status, and inadequate prenatal care.[135,136] A retrospective cohort study of 3,886,364 pregnant women comparing teens to adults, however, found that teen pregnancy increases the risk for adverse birth outcomes even after adjusting for these factors,[137] suggesting that other factors are also at play.

Stress as a predictor of birth outcomes

Epidemiological evidence shows that maternal stress during pregnancy is consistently predictive of negative birth outcomes, including PTB[27,31–33,138]and LBW. [27,31,34,35] In fact, the American Congress of Obstetricians and Gynecologists recommends screening for psychosocial stress as part of prenatal care, citing that it may play a role in PTB and LBW.[37] Adolescents and young adults experience stressors that emanate from various life domains, including close relationships and personal hardships, but for adolescents and young adults who are racial and/or ethnic minorities and from a low socioeconomic status (SES), daily stressors often extend beyond these typical developmental challenges. This population is disproportionately affected by other chronic stressors, such as neighborhood problems (e.g. crime, poor infrastructure), racism and discrimination.[38] Thus, stress may have a substantial effect on birth outcomes among low SES youth of color.

Conceptually, stress is an interactive process in which environmental demands exceed one's adaptive capacity, resulting in three types of responses that can lead to poor health outcomes and, therefore, serve as mediators between experiences of stress and adverse birth outcomes: 1) behavioral, 2) cognitive/psychological and 3) physiological responses.[40,41,139] Experiences of stress are hypothesized

to affect birth outcomes through these three inter-related stress-response processes, as detailed below.[44]

First, negative health behaviors, such as smoking or substance use, can serve as coping mechanisms for stress. [41,140] Studies show that stress consistently predicts negative health behaviors (e.g. smoking, substance use, poor dietary habits, physical inactivity) among pregnant women, [46,139] which are also consistently related to adverse birth outcomes. For example, smoking and substance use are well-documented causes of PTB,[19] and inadequate nutrition and smoking are known risk factors for LBW.[20,139]

Second, negative appraisals or perceptions of stress are thought to cause cognitive and psychological responses, which subsequently directly affect both behavioral and physiologic responses, and risk for physical and mental disease.[40,51] These psychological responses include depressive symptoms, which have been independently linked with negative birth outcomes.[51]

Third, two physiologic pathways through which stress and the cognitive and psychological responses may affect birth outcomes include the neuroendocrine system—specifically the hypothalamic-pituitary-axis (HPA), which regulates the physiological response—and the immune/inflammation system. Under conditions of chronic psychological stress, the HPA axis can become dysregulated, leading to chronically elevated levels of glucocorticoids in the system,[138] which could signal a series of endocrine events leading to PTB.[138] Stress may cause preterm birth through the immune/inflammation pathway by increasing maternal susceptibility to infection,[27] causing the release of catecholamines[27] or causing an inflammatory response that triggers contractions, cervical ripening and membrane rupture.[29]

Dunkel Schetter and Lobel[139] offer the most comprehensive framework depicting the pathways through which maternal stress may influence PTB and LBW (Figure III-1). The conceptual model

describes how both chronic (persistent or recurrent difficulties over the long term) and acute (discrete threats that are shorter term) stressors can influence birth weight and gestational age at delivery. Dunkel Schetter and Lobel's framework synthesizes findings from a large literature examining individual stress components and birth outcomes. Previous studies, however, have been inconsistent in terms of how stress is conceptualized,[78] if a conceptual model is attended to at all, and none assess all components of this model, including stress exposures, appraisal, responses and birth outcomes.

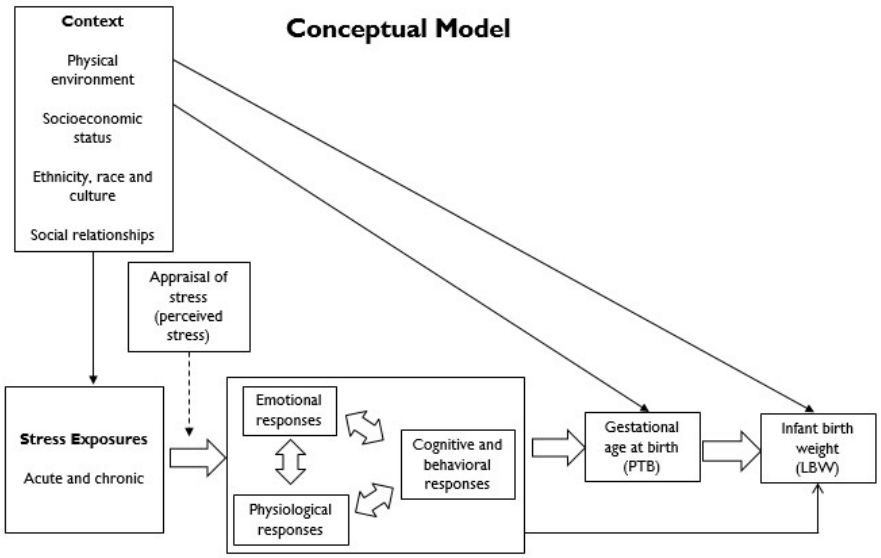

Figure III-1. Conceptual model of stress and birth outcomes. Reproduced from Pregnancy and Birth Outcomes: A multilevel analysis of prenatal maternal stress and birth weight. In: *Handbook of Health Psychology (2nd Edition)* (p.451), by Dunkel-Schetter and Lobel, 2012, New York: Springer.[43]

Sources of stress

The stressors that expectant parents experience may come from multiple sources, including individual experiences (e.g. job loss), interpersonal exposures (e.g. conflict in a steady relationship), neighborhood conditions (e.g. crime in neighborhood), and societal context (e.g. racism). These stressors are common among low income populations and racial and ethnic minorities due to social and economic structures and influences.[141] These stressors could influence birth outcomes through the

behavioral, psychological and physiological pathways described above, and a large body of literature has examined how maternal experiences in each of these domains is associated with negative birth outcomes. For example, checklist inventories of acute major life events mothers experienced during pregnancy have been associated consistently with lower infant birth weight and gestational age at birth.[35,139] Maternal perception of neighborhood problems during pregnancy have been significantly associated with lower infant birth weight,[142] with the hypothesis that living in a disadvantaged neighborhood causes stress by increasing the likelihood of experiencing stressful life events and exposing individuals to neighborhood disorder.[143] Discrimination and racism are also thought to cause chronic stress; however, the findings on the effects of maternal experiences of discrimination on birth outcomes have been mixed. Some studies exploring whether maternal experiences of discrimination during pregnancy are associated with LBW and PTB have found a significant association (e.g. Dominguez et al.,[144] Collins et al.[145]), while others have not (e.g. Lu and Chen,[146] Shiono et al.[147]). Most studies have assessed the influence of these different sources of stressors on birth outcomes individually, despite acknowledgement that birth outcomes are the result of conjoint effects of multiple factors.[139]

Stress among expectant adolescents and young adults

While stress cuts across all populations, stress may have a larger deleterious effect on expectant adolescents and young adults for several reasons. First, adolescents and young adults are developing and may lack effective coping skills and resources. [94] Second, pregnancy itself can be a stressor for any expectant parent,[148] but the transition to parenthood may be exceptionally stressful for adolescents because they are concurrently confronting the challenges of parenthood and adolescent development.[149] Pregnancy can also give rise to or exacerbate other stressors that may be more common among adolescents and young adults compared to older expectant parents (e.g. financial concerns for supporting a new baby, relationship problems).[96] Third, during adolescence and young adulthood, social

relationships outside of the family, including romantic relationships, become increasingly important.[97] An adolescent's romantic partner plays an important role in the attachment, support, and caregiving behavioral systems.[98] Most expectant adolescents and young adults are involved with the baby's father during pregnancy;[65,150] however they are still learning to interact with their partner and developing their relationship skills[98] and therefore negotiating this relationship may be a significant source of stress for adolescents compared to older adults.

Paternal Influence on birth outcomes

A large body of literature has documented that women's experiences of stress during pregnancy are associated with negative birth outcomes;[27,31–34,138] however, research has also demonstrated that the perceptions of stress and coping strategies are affected by social relationships.[62] The relationship with the baby's father is often an important social relationship in an expectant woman's life, regardless of marital status. Over 80% of unmarried pregnant women are in a relationship with the baby's father during pregnancy.[63] Thus, a woman's male partner likely has a substantial influence on the expectant mother during this time.

Despite the importance of male partners during pregnancy, very little research has explored paternal influences on birth outcomes.[66] Research examining the impact of stress on birth outcomes that includes paternal factors has been limited to maternal reports of paternal involvement and support, and these measures are often crude (e.g. the extent to which there is a father's name on the birth

certificate).[68,71] Researchers and clinicians have almost entirely focused on how women's experiences are associated with birth outcomes; however, men's experiences of stress during his partner's pregnancy may also influence birth outcomes through his effects on maternal psychosocial factors.[67]

In fact, substantial evidence supports the theory that among couples, stress experienced by one member can affect the well-being of the other member. [72] For example, a woman's partner's stress with his friends may impact her own depression.[72] Much of this research has focused on the cross-over of one's work stress to the other's well-being[72] and relationship satisfaction (e.g. Neff[74]); however no studies have documented this process among expectant couples, and none have assessed the impact of paternal stress during pregnancy on birth outcomes via effects on maternal well-being.

Current Study

The current study aims to, first, investigate the association between maternal and paternal stress during pregnancy and the gestational age at birth and birth weight of their baby among adolescent and young adults from low SES. Second, this study aims to explore whether the associations of maternal and paternal experiences of stress with birth outcomes, if evident, are mediated by maternal depressive symptoms.

b. Methods

b.1 Data Source

Overview and Sampling Procedures

Data for this analysis come from baseline interviews of 296 expectant young couples who participated in the Parenting and Relationship Transition and Risk Study (PARTNRS) between 2007 and 2011, and their birth hospitalization medical records. Women were recruited from obstetrics and gynecology clinics and an ultrasound clinic in four university-affiliated hospitals in southern Connecticut. An initial screening included only women who reported they were in a romantic relationship with the baby's father.

If the baby's father was not present at the time of screening, research staff asked for permission to contact him to explain the study. If the expectant woman was willing, research staff provided

informational materials for the baby's father and asked the baby's mother to talk to him about the study. Research staff contacted the baby's father to answer any questions and, if he was interested, scheduled an appointment for the couple's baseline interview.

Participants

Inclusion criteria to participate in the baseline interview for both men and women were: (a) pregnant or partner was pregnant after 24 weeks gestation; (b) women were age 14-21 years and men were age ≥ 14; (c) both reported being in a romantic relationship with each other; (d) both reported being the biological parents of the unborn baby; (e) both agreed to participate in the study and (f) both were able to speak English and/or Spanish.

Study Procedures

A research staff member obtained Informed consent at the baseline appointment, which was conducted after 24 weeks gestation but before the baby was born. The couples separately completed a structured interview via audio computer assisted self-interviews (ACASI) during this baseline appointment. ACASI allows respondents to listen over headphones to spoken questions that are also displayed on the computer's screen.

After the baby's due date, a research assistant went to each affiliated hospital and collected birth outcome information from each participating woman's medical record. A small number of women did not deliver at an affiliated hospital.[4] In this case, the research assistant collected basic birth outcome information (e.g. birth weight, gestational age at delivery) directly from the baby's mother by calling her

[4] The number of cases where the birth outcome information was not abstracted from the mother's medical record, but rather from the mother's report, is unknown due to a lack of documentation in study records; however, it is estimated at less than 5%.

on the telephone. The Yale University Human Investigation Committee and the Institutional Review Boards (IRB) at study clinics approved all procedures. The CUNY Graduate Center granted IRB approval to use the de-identified PARTNRS data as well. Each participant (mothers and fathers separately) was paid $25 for his or her voluntary participation in this interview.

b.2 Measures

Please see Appendix III-1 and Appendix III-2 for detailed item descriptions, and estimates of the validity and reliability of the measures used in the analyses for this chapter. All measures for this aim were assessed among both mothers and fathers at the baseline interview during pregnancy (after 24 weeks gestation).

Assessment of stress

Table III-1 shows a detailed description of the relationship quality predictor variables. Three different stress measures were assessed via ACASI at the baseline interview and included in this analysis. Stressful life events over the previous six months were measured using a modified 11-item version of Brugha and Cragg's Life Events Scale (LES).[151] Participants reported whether they experienced each item (yes/no), such as suffering a serious injury or assault and having money problems. Experiences of discrimination (referring to experiences "in general") were measured using Essed's Daily Life Experiences Scale.[152] Participants responded on a 6-point scale ranging from "Never" to "Once a Week Or More" for each item, such as "In general, how often are you observed or followed while in public spaces?" and "In general, how often are you ignored, overlooked, or not given service (in a restaurant, store, etc.)?" Perceived stress over the past month was measured using ten items from Cohen's

Perceived Stress Scale.[88] Participants indicated how often they felt each item on a 5 point scale ranging from 0=”never” to 4=”very often,” such as “In the past month, how often have you felt unable to cope with all of the things you had to do?” and “how often have you felt that difficulties were piling up so high that you couldn’t overcome them?”

Assessment of Birth Outcomes

The baby’s birth weight and gestational age at delivery were abstracted from the mother’s medical record at delivery (or from the baby’s mother if not available as described under *Study Procedures*).

Gestational age was recorded in weeks and birth weight was recorded in grams.

Covariates

Several covariates were accounted for during model building and are described in detail in Appendix III-1. A priori hypothesized demographic confounders included maternal and paternal household income, age, work/student status, race/ethnicity, maternal parity and baby’s gender.

Clinical risk factors were also a priori hypothesized confounders. A summary score of five clinical risk factors ranging from 0 to 5 was computed due to the low numbers of women with any one factor. Women were given a value of 0=No and 1=Yes for each of the five clinical risk factors: obese before pregnancy (based on BMI >30 calculated from self-report of pre-pregnancy weight and height); positive Chlamydia and/or Gonorrhea test at any point during pregnancy (LCR test during study visit in the late second or early third trimester); medical record indication of pre-eclampsia; medical record indication of

gestational diabetes; and self-report on whether she received any prenatal care prior to the interview, which was within the third trimester.

Smoking and alcohol use during pregnancy were measured using an adapted, 7-item version of the Recreational Drug Use Scale.[153] Frequency of use during the past three months for both substances were assessed using a 5-point Likert scale, ranging from 0 = "Never" to 4 = "Every Day." This study dichotomized the responses to 0 = "Never" and 1 = "At least some."

Mediator

Depressive symptoms over the past week were measured using 15 of the 20 items in the Center of Epidemiological Studies-Depression Scale (CES-D).[91] Participants responded on a 4-item scale ranging from 0="Less than 1 day" to 3="5-7days". Items included "during the past week I had crying spells" and "during the past week I felt depressed." Responses were summed to form a continuous depressive symptom score ranging from 0 to 45.

Table III-1. Stress predictor and mediator variables

Construct	Measure	Description	Response Scale	Scoring
Stressful Life Events	Brugha and Cragg Life Events Scale (LES)[151] (adapted)	11 items assessed experiences of stress (e.g. having an illness, death in the family)	1=Yes, 0=No	-Responses summed to form an index -Higher scores correspond to more events (range: 0-11)
Discrimination	Essed Daily Life Experiences Scale[152] (adapted)	20 items assessed experiences of discrimination (e.g. not being given service in store, being called insulting name).	6-point scale ranging from 0 ("Never") to 5 ("Once a Week or More")	-Responses summed to form a continuous scale -Higher scores correspond to more discrimination (range: 0-100) (α = 0.92 w, 0.94 m)
Perceived Stress	Cohen Perceived Stress Scale[88]	10 items assessed degree situations are stressful (e.g. how often nervous or stressed; unable to control important things)	5-point scale ranging from 0 ("Never") to 4 ("Very often")	-Responses summed to form a continuous scale -Higher scores correspond to more perceived stress (range: 0-40) (α = 0.77 w, α = 0.74 m)
Depressive Symptoms	Center of Epidemiological Studies-Depression Scale (CES-D).[91] (adapted)	15 items assessed how often experienced the depressive feeling or thought (e.g. I felt depressed, had crying spells) -Five behavioral manifestations of depression items were removed	4-point scale ranging from 0 ("Rarely or none of the time (less than 1 day") to 3 ("Most of the time (5-7 days)")	-Responses summed to form a continuous scale -Higher scores correspond to more depressive symptoms (range: 0-45) (α = 0.77 w, α = 0.74 m)

b.3 Statistical Analysis

I generated descriptive statistics of sample characteristics using IBM SPSS Statistics V22 (IBM Corporation, Armonk, NY). I used IBM SPSS AMOS V22 to construct a latent stress measure from the three stress measures and complete all remaining analyses. I then used structural equation modeling (SEM) to test the extent to which the maternal and paternal latent stress variables predicted gestational age at birth and birth weight after adjusting for a priori hypothesized confounders. I further examined whether maternal depression explained any of the association between the latent stress variables and birth outcomes to test for it as a mediator. SEM simultaneously assesses direct, indirect and total effects of a system of variables on an outcome. It can be tailored to account for clustering of data within couples, can accommodate multiple correlated outcomes (such as birth weight and gestational age in this study) and can include latent variables.[154,155] Therefore, SEM was ideal for use in this study.

Sample

Of the 296 participants, seven men had substantial missing data (i.e. had at least one stress measure missing). Maternal and paternal demographic characteristics did not differ significantly among the men with missing data on the stress variables compared to those who were not missing data (not shown). Therefore, couples where men were missing stress data were excluded. Fourteen additional couples were missing data for birth weight and gestational age at delivery and another three were missing data on birth weight. Maternal and paternal demographic characteristics did not differ significantly between the couples missing birth outcomes data and those with this data (not shown). These 17 couples were also excluded. Two couples had multiples and due to the greater likelihood that these babies would be born early or small due to being a multiple alone, these couples were excluded. The final sample size was 270 couples who gave birth to 270 infants.

One birth weight outlier was identified using the Outlier Labeling Rule as described by Hoagline,

Iglewicz and Tukey.[156] The value for this case (915 grams) was Windsorized to the next lowest value (1,390 grams).[157] Four gestational age outliers were identified using the Outlier Labeling Rule. The values for these cases (27.14-34.00 weeks) were Windsorized to the next lowest value (34.57 weeks).[56]

Model Specification and Identification

I calculated Cronbach's alphas for discrimination, perceived stress and depression scales to estimate the reliability of these scales (Table III-1, column 5). Alpha values were high (ranging from 0.74 to 0.94). I did not calculate a Cronbach's alpha for the stressful life events measure because, as an index, a participant's endorsement of one item should not necessarily be related to the endorsement of another item if the events are independent.[158]

Because participants were part of couples (i.e. dyads), clustering effects were likely. I estimated Spearman's rank correlation coefficient (rho) to determine the collinearity of dyad members' data (Table III-2). In the structural equation model, covariances were drawn between the error terms of the maternal and paternal stress variables to account for clustering as recommended by Kenny et al. (2006).[159]

Table III-2. Correlations between maternal and paternal stress predictor variables

Spearman's Rho				
		Men		
		Stressful life events	General discrimination	Perceived Stress
Women	Stressful life events	.22**	.06	.10
	General discrimination	.10	.15*	.12*
	Perceived Stress	.10	.03	.29**

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Estimation

The model was estimated using maximum likelihood, which compared the likelihood of the given model to the likelihood of a model with perfect fit. This method was preferred because it is asymptotically unbiased and is scale invariant.[160] Unstandardized coefficients were calculated to allow for comparison of coefficients between mothers and fathers.[159]

Testing

Global fit indices recommended by Bollen and Long (1993),[161] and Blunch (2008)[155] were assessed. The overall chi squared test of model fit was calculated; however, because this fit index is sensitive to sample size, the Tucker Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and the p value of close fit (PCLOSE) were also calculated.[155]

c. Results

c.1 Descriptive Statistics

The sample is described in detail in Table III-3. On average, the women in this study were 18.7±1.6 years old and their male partners were 21.3±3.9. The average age difference was 2.6 ±3.3 years. Most of the participants were black (38.2% women and 46.7% men) or Hispanic (40.7% women and 38.2% men). Just over half of the women were in school or working, while nearly three-quarters of the men were in school or working. The average annual household income of women and men was

quite low ($13,567 and $17,518, respectively). The average birth weight of the baby was 3,219.2±528.2 grams and 5.6% had a low birth weight. The average gestational age at delivery was 39.3±1.8 weeks and 7.8% of babies were born preterm.

Table III-3. Characteristics of Sample Population (N=270)

	MOTHERS			FATHERS		
	N	**Mean**	**SD**	**N**	**Mean**	**SD**
Birth Weight (g) of baby	270	3219.19	528.23			
Gestational Age at delivery (weeks)	270	39.25	1.82			
Age	270	18.69	1.62	270	21.26	3.86
Household Income (1,000K)	268[5]	13.59	15.59	270	17.61	22.03
Gestational age at first interview	270	28.92	5.25	270	28.92	5.26
	N	**%**		**N**	**%**	
Current pregnancy is first child	215	79.30		205	75.40	
Baby Boy (this pregnancy)	140	51.85				
In school or working (FT or PT)	158	58.52		198	73.33	
Race/Ethnicity						
Black	103	38.15		126	46.67	
Hispanic	110	40.74		103	38.15	
White	46	17.04		29	10.74	
Other	11	4.07		12	4.44	
Marital Status/Living Situation						
Living alone and not married	107	39.26		82	30.37	
Not Married, Living with Partner[6]	126	46.67		130	48.15	
Married	38	14.07		52	19.26	
Separated/Divorced	0	0.00		2	0.74	
Widowed	0	0.00		4	1.48	
Obese before pregnancy	61	22.59				
Cigarette use during pregnancy	41	15.19				
Alcohol use during pregnancy	13	4.82				
Any prenatal care to date	257	95.19				
Pre-Eclampsia	2	0.74				
Gestational Diabetes	3	1.11				
STI during pregnancy[b]	13	4.89				
	N	**Mean**	**SD**	**N**	**Mean**	**SD**
Stressful Life Events	270	2.11	1.94	270	2.34	2.22

[5] Data is missing for respondents who refused to answer these questions or provide a sample.

[6] Marital status/living situation may not match between males and females because each individual reports his/her own answer and there is some discrepancy in how members of the couple reported their situation.

General Discrimination	270	0.85	0.81	270	1.05	1.02
Perceived Stress	270	16.73	6.15	270	15.35	6.27
Depressive Symptoms	270	10.53	7.34	270	8.94	6.40

Table III-4. Correlations of Study Variables among Women

	Variable Name (Women)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Birth Weight (g)	--																			
2	Gestational Age (weeks)	.44**	--																		
3	Stressful Life Events	-.08	.03	--																	
4	General Discrimination	-.04	.00	.46**	--																
5	Perceived Stress	-.05	-.05	.25**	.39**	--															
6	Depressive Symptoms	-.15*	-.06	.19**	.27**	.68**	--														
7	Age	-.03	-.05	-.13*	-.10	-.11	-.15*	--													
8	Income	.14*	.10	.00	.05	.00	-.14*	.18**	--												
9	In School or working (FT or PT)	.03	.02	.02	.05	.11	.07	-.21**	.10	--											
10	Black	-.09	-.02	-.03	-.09	.01	.06	.03	-.05	.03	--										
11	Hispanic	.07	.01	-.05	-.11	-.03	-.01	-.12	-.05	.09	-.65**	--									
12	White	.07	-.01	.09	.14*	.00	-.08	.11	.12*	-.16**	-.36**	-.38**	--								
13	Not married nor living with partner	-.07	.00	.02	-.01	.03	.14*	-.04	-.02	.15*	.10	-.03	-.06	--							
14	Not married, living with partner	.08	.07	.01	.02	-.03	-.11	.08	.01	-.07	-.06	.01	.05	-.75**	--						
15	Married	-.01	-.11	-.05	-.01	.00	-.05	-.05	.02	-.11	-.05	.03	.01	-.33**	-.38**	--					
16	BMI before pregnancy	.13*	-.04	.05	.06	-.01	.02	.02	.06	.02	-.01	.03	-.01	.03	-.07	.05	--				
17	Clinical risk score	.06	-.03	.05	.02	.01	.04	.10	-.03	.02	-.07	.04	.05	-.05	-.01	.08	.53**	--			
18	Pregnancy is first child	-.04	-.08	-.02	-.14*	-.04	-.08	.31**	.02	-.16*	.04	-.01	-.02	-.08	.07	.01	.05	.04	--		
19	Baby boy	.17**	.09	-.06	-.07	-.10	-.13*	-.05	.01	-.13*	-.02	.04	.00	-.06	.05	.01	.03	.01	-.05	--	
20	Cigarettes during pregnancy	-.11	.07	.04	.04	.00	-.02	.09	-.06	-.10	.01	-.25**	.19**	-.04	.02	.04	-.14*	-.08	.10	-.05	--
21	Alcohol during pregnancy	.07	.08	.05	.04	.06	.05	.05	.12	-.20**	-.03	-.01	-.01	-.07	.03	.06	.03	-.04	-.11	.01	.10

*P<0.05 **P<.01

Table III-5. Correlations of Study Variables among Men

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Birth Weight (g)	--																		
2	Gestational Age (weeks)	.44**	--																	
3	Stressful Life Events	.01	.04	--																
4	General Discrimination	.13*	.07	.34**	--															
5	Perceived Stress	.04	.01	.24**	.34**	--														
6	Depressive Symptoms	.00	-.02	.07	.17**	.61**	--													
7	Age	-.03	-.03	.05	.02	.12*	.07	--												
8	Income	.02	.00	-.13*	-.05	-.19**	-.20**	.12*	--											
9	In School or working (FT or PT)	.01	-.08	-.16*	.00	-.15*	-.11	-.04	.31**	--										
10	Black	-.10	.00	.11	.08	-.01	-.03	.05	-.05	-.12*	--									
11	Hispanic	.00	-.07	-.17**	-.15*	.02	.04	-.10	-.05	.06	-.73**	--								
12	White	.17**	.09	.09	.08	-.03	-.02	.14*	.19**	.07	-.32**	-.27**	--							
13	Not married nor living with partner	-.12*	.03	-.05	-.06	.02	.00	.05	.00	-.03	.17**	-.12	-.03	--						
14	Not married, living with partner	.09	.08	.03	.11	.02	-.01	-.01	-.04	.01	-.08	.07	.00	-.65**	--					
15	Married	.06	-.10	.05	-.03	-.04	-.02	.00	.07	.04	-.10	.06	.04	-.33**	-.47**	--				
16	BMI before pregnancy	.10	.01	-.06	.08	.04	-.01	.20**	.03	.03	-.11	.12	.02	-.11	.08	.05	--			
17	Pregnancy is first child	-.01	.08	.02	.06	.13*	.19**	.26**	-.16**	-.18**	.12*	-.09	-.05	.04	-.04	.01	.05	--		
18	Baby boy	.17**	.09	.08	.00	-.09	-.10	.02	.08	-.13*	.04	-.07	.02	.02	-.10	.09	.01	-.09	--	
19	Cigarettes during pregnancy	.08	.06	.23**	.19**	.08	.05	.16**	-.12	-.20**	.11	-.16**	.01	-.01	.00	.04	.03	.23**	-.04	--
20	Alcohol during pregnancy	.07	.08	.25**	.32**	.15*	-.03	.20**	.09	-.03	.11	-.10	.02	.04	.00	-.01	.06	.06	.04	.37**

*P<0.5 **P<.01

c.2 Latent Variable Model Building

The first step in the analysis was to evaluate whether the three measures of stress (stressful life events, general discrimination and perceived stress) could be represented by a single, higher-order latent factor called maternal and paternal "stress." Separate stress latent factors were created for men and women. Based on the significant correlations between maternal and paternal measures of stress (Table III-2), I allowed correlations between the maternal and paternal residuals for each measure as well as correlations between maternal and paternal latent "stress" factors.

All path coefficients between the stress measures and the stress factor were statistically significant and greater than or equal to 0.40 (p's < .05) (Table III-6). The model of the higher-order latent stress factors exhibited good fit (X^2 =9.88, df=5, p=0.08; TLI=0.93; RMSEA=0.06 (0.00-0.12); PCLOSE=0.32).

Table III-6. Factor loadings onto women's and men's stress latent variables.

Women's Stress Latent	Estimate
General Discrimination	.91
Stressful Life Events	.52
Perceived Stress	.40
Men's Stress Latent	
General Discrimination	.68
Stressful Life Events	.51
Perceived Stress	.48

Factor structure invariance by gender and race/ethnicity

I tested the possibility that the way the stress measures load onto the stress latent factors could differ between men and women. The model fit did not differ significantly when constraining the loadings of each measure on to the latent stress constructs to be equal for men and women compared to a model when the measure loadings were allowed to vary by gender (X^2_{diff}=0.63, df=2, p=0.73).[159]

Therefore, I concluded that the measures of stress loaded similarly for the maternal and paternal stress latent factors.

I also tested the possibility that the factor structure differed by race/ethnicity. Because the "white" group was small, I compared the factor structures of blacks versus Hispanics. The model fit did not differ significantly when constraining the latent factors to be equal for black and Hispanic women (X^2_{diff}=3.84, df=6, p=0.70) nor black and Hispanic men (X^2_{diff}=6.35, df=6, p=0.39).[162] Therefore, I concluded that there was configural invariance by race/ethnicity.

c.3 Influence of the latent stress factors on birth weight and gestational age

Next, I created a model to examine the influence of the maternal and paternal latent stress factors on birth weight and gestational age (without covariates). The model exhibited good fit (X^2=14.23, df=13, p=.36; TLI=0.99; RMSEA=0.02 (0.00-0.07); PCLOSE=0.83). The path from paternal stress to gestational age was significant (B=0.29, P=.03) and the path from paternal stress to birth weight was marginally significant (B=71.30, P=.07). Both paths were positive (i.e. greater stress associated with better birth outcomes). The paths from maternal stress to gestational age (B=0.02, P=.90) and birth weight (B=-28.04, P=.43) were not significant, although the path to birth weight was in the expected negative direction.

A model adding in all maternal and paternal covariates except substance use (demographic characteristics, clinical risk factors, baby gender) also exhibited good fit (X^2=191.66, df=110, p<.001; TLI= 0.89; RMSEA= 0.05 (0.04-0.07); PCLOSE= 0.36). I did not include substance use covariates for all remaining analyses because, from a stress and coping framework,[163] substance use may be better described as a mediator between the effect of stress on birth outcomes rather than a confounder that I need to adjust for. The path from paternal stress to gestational age remained significant (B=0.31, P=.03) and the path from paternal stress to birth weight remained marginally significant (B=72.66, P=.06) and in

the positive direction. The paths from maternal stress to gestational age (B=-0.001, P=.99) and birth weight (B=-37.01, P=.29) remained not significant, and both paths were in the expected negative direction.

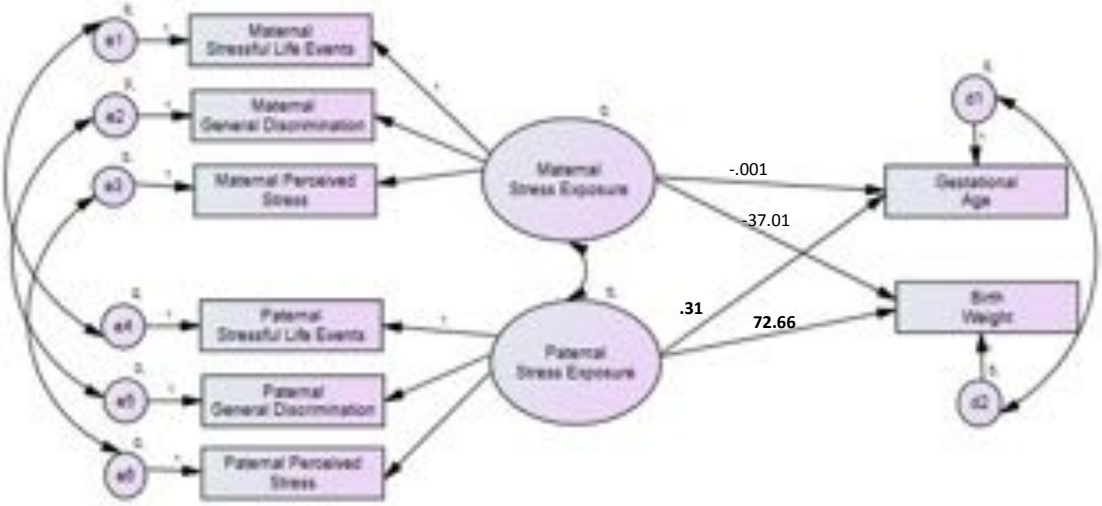

Figure III-2. Structural equation model examining the impact of the latent maternal and paternal stress factors on birth weight and gestational age at delivery accounting for covariates (demographic characteristics, clinical risk factors, baby gender). Bold path coefficients displayed are statistically significant (P<.05) or marginally statistically significant (P=.06)

To quantify the impact of paternal stress on gestational age, I used regression imputation to create values for the latent variable of paternal stress.[162] Fathers with the highest level of stress (splitting the imputed paternal stress variable at the median) had babies that were born about 0.5 days later (M=39.52, SD=1.26) compared to babies born to fathers with low levels of stress (M=38.99, SD=1.17, t=-2.46, P=.02). Fathers with the highest level of stress also had babies that were 94.75 grams heavier (M=3,268.32, SD=480.04) compared to babies born to fathers with low levels of stress (M=3,173.57, SD=557.24, t=-1.50, P=.14), although the difference was not significant.

c.4 Mediation by depressive symptoms

Next, I examined mediation of the effect of paternal stress on birth outcomes by maternal and paternal depressive symptoms by entering maternal and paternal depressive symptom variables into the model that also accounted for all covariates (Figure III-3). The model fit was acceptable (X^2 =295.99, df=151, p<.001; TLI=0.85; RMSEA=0.06 (0.05-0.07); PCLOSE=0.06). To examine mediation by depressive symptoms, I first explored whether paternal stress was associated with his own and his partner's depressive symptoms. Greater paternal stress was only associated with his own depressive symptoms (B=6.33, P<.001). Second, I examined whether paternal depressive symptoms were associated with either birth outcome. Paternal depressive symptoms were not significantly associated with gestational age (B=-.01, P=.53) or birth weight (B=-3.94, P=.61).

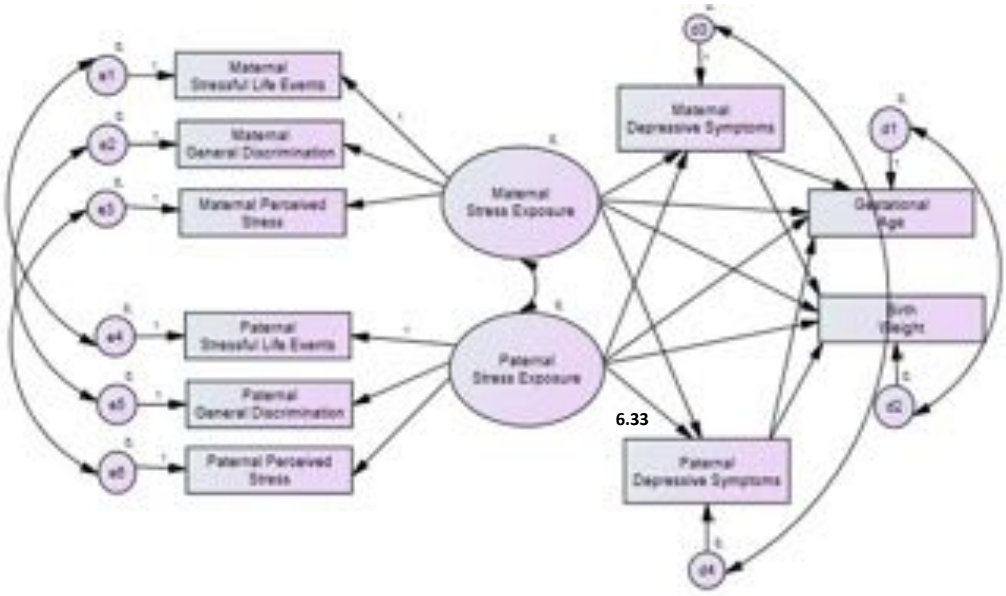

Figure III-3. Structural equation model examining mediation of the association between latent paternal stress factors on birth weight and gestational age at delivery by maternal and paternal depressive symptoms.

d. Discussion

Contrary to many published studies,[27,31–34,138] this analysis did not find a significant association between young expectant mother's stress during pregnancy and the gestational age at birth and birth weight of her baby. This analysis did find, however, that paternal stress during pregnancy was significantly *positively* associated with gestational age at birth—a finding that was contrary to my hypothesis that paternal stress would be negatively associated with birth outcomes. While the results were in the opposite of the expected direction, they suggest that paternal experiences during his partner's pregnancy are associated with his baby's birth outcomes and his experiences should not be ignored. In addition, the associations between paternal stress and the birth outcomes persisted after controlling for several important confounders, including clinical risk factors and demographic characteristics.

Lack of effect of maternal stress on birth outcomes

The lack of effect of women's stress on birth outcomes was contrary to much of the published evidence showing a significant negative effect of stress on birth outcomes.[27,31–34,138] the women in this study generally had low incomes ($13,590 household income) and were young. These young women were likely all under a high amount of stress as they grappled with potential relationship issues and financial challenges, while concurrently traversing the road to parenthood and adulthood. It is possible that all of the expectant women were under a high amount of stress and that there was not enough variability in the stress measure to identify an association with the birth outcomes.

In addition, the stress assessments used in this study did not include items that were specific to the stressors of pregnancy, which research has suggested may be a stronger predictor of birth outcomes among expectant mothers compared to general life event stress and perceived stress.[47] This may be an additional reason that I did not see an effect of maternal stress on birth outcomes. Pregnant women

(and their partners) may experience life events and worries that are specific to being pregnant, such as concerns about financially supporting a baby or worries about the health and development of their baby. Not including these relevant stressors may have led to inaccurate estimates of the level of stress and its impact on birth outcomes in this study.[86]

Positive effect of men's stress on birth outcomes

The lack of effect of maternal stress on birth outcomes coupled with the *positive* effect of paternal stress on birth outcomes suggests that there may be an alternative model for how stresses processes influence birth outcomes. My original hypothesis was based on the traditional theory of human stress characterized mainly by the fight-or-flight response, in which a stressor activates the HPA and the immune/inflammation pathways within an expectant mother, which could affect fetal growth and initiate premature birth.[27,138] This theory assumes that the physiological and behavioral cascade of events that follows a stress exposure is the same for men and women. However, as the "tend and befriend" model of female stress response proposes, maternal responses to stress may not be best characterized solely by the fight-or-flight response.[164,165]

The "tend and befriend" model suggests that under conditions of stress, women are more likely than men to affiliate with others and seek social support.[164–166] In contrast, men are more likely to display behaviors that are fight-or-flight related under conditions of stress, such as aggressive behavior and substance use. These gender differences in behavioral stress responses are thought to be informed by the human attachment system, which is activated particularly in times of stress. Research has shown that women tend to display more attachment anxiety than men, and men tend to display more attachment avoidance.[167] As such, under conditions of stress, women in this study may have sought substantial support from the father of their baby. This maternal support seeking behavior may have benefitted the well-being of the expectant mother; however, this increased support seeking from the

expectant mother may have caused her male partner more stress. Thus, the young men in this study may have provided more support to their expectant partner in this time of stress, which benefitted the expectant mother's health and well-being, and ultimately the baby's well-being, but at the cost of their own increased stress. In support of this hypothesis, I conducted a post-hoc analysis using imputed values of the stress latent variables.[162] I found that women's stress was significantly correlated with her own attachment anxiety (r=.40, P<.001),[7] and women's attachment anxiety was significantly correlated with men's stress (r=.15, P=.02). Unfortunately, the original study did not include a measure of support seeking.

Another potential explanation for this positive effect is that the women whose partners had the most stress are less involved with their partner and more involved with their own family, who provide compensating support for the expectant mother. A post-hoc analysis using imputed values of the paternal stress latent variable[162] found that men with high levels of stress (median split) reported greater depression, lower optimism, lower life satisfaction, and more smoking, alcohol use and marijuana use. Perhaps the expectant women whose partners are highly stressed and exhibit these unhealthy behaviors rely more on their own family for support, who compensate and ultimately help support a healthy pregnancy. Post-hoc t-tests showed that women whose male partner had the highest stress were significantly less likely to receive financial support from her male partner and marginally more likely to receive financial support from her own parent. The men with the greatest stress also reported more attachment avoidance and anxiety, which could have ultimately deterred a relationship from being close. In fact, the men with the highest level of stress had lower intensity of feelings for their partner.

[7] Attachment anxiety was measured using the Experiences in Close Relationships Inventory (ECRI) by Brennan, Clark and Shaver (1998)[168]

Unfortunately, the original study that this data come from did not have a strong measure of "closeness" of the couple. A proxy for closeness of the couple may be the living arrangement of the couple—and specifically whether the expectant woman lives with her own mother or not. A post-hoc analysis found that the when the mother of the baby lived with her own mother (and not the baby's father), men's stress did not have a significant effect on gestational age (B=-.04, P=.85); however, when she lived with the baby's father (with her own mother or not), men's stress had a significant positive effect on gestational age (B=.38, P=.03) when controlling for all covariates except substance use.

Given that men's stress still had a positive effect on birth outcomes among the "closest" couples, the "tend and befriend" model is still consistent with these outcomes. When couples are closer, the men may be a stronger support system for the expectant mother, which could benefit her health and well-being and ultimately the health of the baby. However, this support of the expectant mother may come at the expense of higher stress for the baby's father. While social support for pregnant women and new mothers is considered important in our society, we generally pay little attention to expectant and new fathers. Interventions that support not only expectant and new fathers, but also the relationship between expectant and new parents may be important to the health and well-being of the whole family system.

Lack of mediation by depressive symptoms

Depressive symptoms did not mediate the effect of paternal stress on birth outcomes. In this study, there was no evidence of stress and strain crossover between members of the couple.[169] Maternal and paternal experiences of stress were not associated with their partner's depressive symptoms. This may be due to the fact that these couples are young, nearly all unmarried and 46.7% of the young mothers still live with their own mothers. Evidence has shown that the closeness of a couple

may moderate the cross-over effect, with closer couples experiencing more cross-over of the effects of stress from one member to the other.[73] Many of the couples in this study may not have had close enough relationships for paternal stress to cross over and affect maternal feelings of stress and wellbeing. In a post-hoc moderated mediation analysis,[162] however, the effect of men's and women's stress on their partner's depressive symptoms still did not differ based on whether she lived with the father of her baby or with her mother (and not the baby's father) ($Z=-.71$, $P>.05_{\text{men's effect on women}}$; $Z=-.38$, $P>.05_{\text{women's effect on men}}$) when controlling for all covariates except substance use.

Concluding remarks and future research directions

Future studies would be strengthened by the inclusion of stress appraisals and perceptions. What is stressful for one person may not be stressful for another, and therefore the likelihood of reporting a stressful event may be affected by an individual's appraisal of the stressor.[90] Measures of stress appraisals and perceptions could ascertain the individual's perception and evaluation of potential harm posed by a specific external demand (i.e. stressor) and their ability to cope with the demand.[170] The inclusion of biological indicators of stress responses may also help elucidate this gap between whether a stressor actually has a physiological effect on the expectant mother that could ultimately affect the health and development of the fetus.[35]

Despite the fact that the findings from this investigation may leave us with more questions than answers about paternal effects on birth outcomes, even including father's experiences and feelings within birth outcome research is a step in the right direction as there has been virtually no investigation in this arena. The findings from this study suggest that there *is* a relationship between birth outcomes and men's experiences during pregnancy; however, the lack of consistency of the findings with accepted theory on how stress affects health indicates that more research is necessary. This is the first analysis to explore the effect of *paternal* stress on birth outcomes, and the pathways through which he has an

effect. This analysis also assessed direct report of stress exposures and responses from the fathers, avoiding measurement error associated with using maternal reports of paternal experiences.

The analytical techniques used in this research also strengthen the analyses. The analysis accounted for the correlated nature of maternal and paternal reports, while maintaining the strength of the total sample size (i.e. without conducting the analyses separately by gender). In addition, structural equation modeling allowed for the simultaneous assessment of multiple hypotheses involving complex pathways, while parceling out measurement error.

This is the first study in the literature to date that explores the role of expectant father's experiences of stress during his partner's pregnancy on his child's birth outcomes using direct report from the fathers and strong analytical techniques. The study demonstrates that paternal experiences of stress during his partner's pregnancy are significantly associated with birth outcomes, but not in the direction that is consistent with conventional theory of how stress is related to one's own and one's partner's health and well-being. This study offers a unique perspective building on the "tend and befriend" model to explain how greater paternal stress during pregnancy may be positively associated with his baby's birth outcomes. Future studies that further explore alternative models for how paternal experiences and well-being during pregnancy affect his baby's birth outcomes are warranted.

Chapter IV. Stress and Behavioral Risk among Young Expectant Couples

a. Introduction

Learning to cope with psychosocial stress is a fundamental component of adolescent development. Decades of research has shown us that exposure to stressors and the ways in which adolescents manage their emotions, thoughts and behaviors influence their mental and physical health.[171,172] Much research has helped elucidate the types of stress adolescents experience and the ways in which they cope, which can include unhealthy behaviors such as substance use (e.g.[143,173–179]). There has been little investigation, however, into the basic nature of stress and coping among adolescents who are expecting a baby. This population is important because their responses to stress (take for example, smoking) carry implications for the unborn child. In addition, coping styles (whether healthy or unhealthy) are sensitive to situational factors and developmental changes, such as pregnancy. Thus, coping behaviors exhibited during this sensitive period of fetal development may affect the child's health later in life. Pregnancy may further provide a window of opportunity for intervention—expectant parents are often motivated to change or establish healthy behaviors for the good of their child[180]—and pregnancy may be an opportune time to help couples learn to better manage stress in an effort to support their health and their relationship as parents. We need better information, however, about the nature of the stressors that *expectant* adolescents experience and their responses in order to inform effective interventions.

The experience of becoming a parent is a major life transition that may elicit many new stressors not only for young women, but also for the fathers of their baby. Despite the fact that pregnant adolescent females in the United States are usually unmarried,[39] many still have a relationship with the baby's father during pregnancy[65] and therefore, these young men are also experiencing the major life transition of becoming a parent. Substantial research has shown us that social support can improve coping and buffer the effect of stress on well-being [e.g. 69,181] and that romantic relationships can be a significant source of this much needed social support. Studies have also shown that a romantic

partner's experiences of stress can cross over and affect one's own well-being.[72,169] Despite the interpersonal nature of stress and coping, and the fact that romantic relationships are present and important among pregnant adolescents, few studies of adolescent experiences of stress during pregnancy include the direct report of experiences and behavioral responses of the baby's father.

This paper uses stress and coping theory, and stress and strain crossover theory to predict that expectant adolescents' and young adults' own experiences of stress are associated with their own *and their romantic partner's* health behaviors.

Stress and coping theory

Extensive research has demonstrated a consistent association between stress and health behaviors.[e.g.46,140,178,182,183] This research is based on the hypothesis that people use health behaviors to cope with the distress that they experience. Individuals experience stress when demands exceed the resources the individual has to deal with the demands.[140] When individuals appraise a stressor as harmful, threatening or challenging, they use coping strategies to regulate the stress they experience.[171,184] Some of the coping mechanisms are adaptive and promote health and well-being, such as *active coping* (addressing or altering a stressor through active problem solving,) and *support seeking* (obtaining emotional support from a social network). Other coping mechanisms may lead to behaviors and emotions that can lead to poor health and well-being, such as *disengagement* (avoiding, withdrawing from or denying a stressor) and *distraction* (doing things that take the mind off the stressor).[171,184,185] Negative health behaviors, including substance use and venting anger (which could lead to conduct problems), can serve as a way for adolescents to withdraw from or keep their mind off a stressor, reduce emotional distress or release negative feelings.[163]

Adolescents and young adults may also use negative health behaviors to cope with new and challenging stressors because they may not have developed healthier coping strategies. Adolescent's problem solving abilities, regulation of emotions, empathy and perspective-taking ability are still evolving during this developmental period.[186] Thus, adolescents may use negative health behaviors as coping mechanisms because they have not learned to employ other more adaptive coping strategies, such as identifying and actively pursuing alternative solutions.

Additionally, there is evidence that men and women have different reactions to stress. Studies have found that men are more likely to exhibit externalizing coping behaviors, such as substance use, in response to stress, while women are more likely to exhibit internalizing behaviors or affect (e.g. depressive symptoms) in response to stress.[187,188] The "tend and befriend" model of the stress response proposes that under conditions of stress, men are more likely than women to display "fight-or-flight" related behaviors, such as substance use and aggressive behaviors. This model also suggests that stress is more likely to cause women to affiliate with others and seek social support.[164–166]

Sources of stress and evidence of the impact on adolescent and young adult health behaviors

Adolescents and young adults experience stressors that emanate from various life domains, including close relationships (e.g. a fight with a romantic partner) and general personal hardships (e.g. having something important stolen).[172,189] For adolescents and young adults who are racial and/or ethnic minorities and are from a low socioeconomic status (SES), daily stressors often extend beyond these typical developmental challenges. This population is disproportionately affected by other more severe and chronic stressors, such as neighborhood problems, racism and discrimination.[38] Coping strategies that are typically viewed as the most adaptive and produce the most positive outcomes, may not be realistic or even safe for adolescents within these circumstances. For example, one study found that active coping in response to exposure to violence was associated with increased aggression among

impoverished urban adolescents.[190] In the face of chronic and severe stressors that adolescents have little control over, such as discrimination and neighborhood problems, avoidant coping strategies (such as substance use as a method of disengagement and distraction) that afford them some transcendence from the day to day burden of stress may actually be an adaptive response and even have some benefits.[38,190]

Substantial evidence, discussed below, has demonstrated a link between experiences of stress in each of these domains and negative health behaviors among adolescents and young adults. Neighborhood problems disproportionately affect minority and low-income communities and have been consistently linked to negative health behaviors among adolescents. Neighborhood problems, such as vandalism, rundown buildings, drugs and fights in the streets, become chronic stressors that may elicit negative coping mechanisms among adolescents living in the neighborhood.[143,173] For example, Kowaleski-Jones (2000) reported that perceived neighborhood problems were related to deviant behavior.[175] Among a sample of adolescents in Los Angeles, the perception of their neighborhood as dangerous was related to more oppositional defiant disorder and conduct disorder.[176]

Experiences of discrimination have also been linked to negative health behaviors among adolescents. A nationally-representative survey of African American adolescents found that 87% experienced at least one source of discrimination in the previous year.[191] Several studies among adolescents and young adults show that experiences of discrimination predict greater smoking[177] and other substance use.[182,192]

Discrete life stressors or personal hardships, referred to as stressful life events, are also common among adolescents and young adults. These stressful life events, such as losing a job or having something stolen, have been consistently associated with smoking,[178,182,183] and alcohol use[182] among adolescents and young adults. Further, among adolescents, experiencing more stressful life events has also been associated with greater conduct problems.[193]

Other discrete stressors stemming from important social relationships (e.g. parents and romantic partners) can have a significant influence on adolescent and young adult behavior. During adolescence and young adulthood, social relationships within and outside of the family, including romantic relationships, are extremely important.[97] Acute social-relationship stressors, such as family conflict[194] and romantic relationship dissolution[179] have been related to more substance use among adolescents and young adults.

Stress and the effects on health behavior among pregnant adolescents and young adults

Another important factor impacting the stress experienced by adolescents and young adults is their experience of pregnancy. Ethnic and/or racial minority adolescents and young adults experience a disproportionately high pregnancy rate.[195] Pregnancy can be a stressor for an expectant parent of any age or gender.[148,196] Pregnancy involves significant emotional and physical demands. It is also a major life transition that elicits many stressors, such as concerns over finances, health, and relationships with a romantic partner and family. For adolescents and young adults, the transition to parenthood may further overload coping resources and be exceptionally stressful.[149,197] This stress may lead to engaging in poor health behaviors, even among expectant mothers who intended to abstain from substance use during pregnancy. Many studies have demonstrated that maternal stress during pregnancy is associated with poor maternal health behaviors (e.g. smoking and substance use),[46,139] although these studies have been conducted among adult women.

There is very little research exploring experiences of stress and health behaviors among expectant fathers (of any age), despite the fact that a partner's pregnancy is also a major life transition for expectant fathers who may also have concerns over many issues, including finances and relationships. A young man's experiences during pregnancy may impact his own health and behavior, as well as his pregnant partner's behavior, carrying implications for the health and development of their

child. Substantial evidence has shown that social relationships have important influences on our health and well-being.[62] A majority of expectant female adolescents and young adults are involved with the baby's father during pregnancy,[65] and therefore he likely has an important influence on her during her pregnancy.[98] Despite this fact, the paternal experience during pregnancy has largely been ignored in the literature, and when it is acknowledged, it is usually reported by the expectant mother, introducing potential measurement error.

Stress and strain crossover: theory and evidence

While substantial evidence demonstrates that experiences of stress are predictive of one's own health behaviors, some evidence suggests that experiences of stress can also crossover and affect the well-being of one's romantic partner.[72,169,198] For example, a woman's partner's experiences of stress have been associated with increases in her own depressive symptoms.[72] It is thought that stress can be transferred from one person to the next through the socio-emotional process of empathetic distress, or the "emotional involvement in the problems and distressed feelings of a relationship partner, to the point of taking on the partner's emotional distress and experiencing it as one's own."[199] While empathy for others is considered a developmentally adaptive competency[200] and is fundamental to the development of close relationships,[201] evidence has shown that there can be substantial emotional "costs of caring"[202] that can be mediated by this process of empathetic distress.[199]

This crossover of stress has been documented among young adolescent friend pairs, with young women reporting more empathetic distress than young men.[199] Given evidence that men and women report different patterns in internalizing and externalizing responses to stress,[187,188] it is possible that young men may report less empathetic distress, but more externalizing coping behaviors (e.g. substance use) as a result of his partner's stressful experiences.

Current study

Many studies have shown that an adolescent's experiences of stress have a negative influence on their own health behaviors (e.g.[143,173–179]) and at least one study has shown that adolescents' experiences of stress can influence a close friend's emotional distress.[199] There is also a substantial literature focused on the transmission of job-related stress among husbands and wives.[72]

Very little attention has been paid to the consequences of experiences of stress on romantic partners—someone with whom a pregnant adolescent or young adult has an important relationship and interacts frequently. No research to our knowledge has explored paternal experiences of stress during his partner's pregnancy and the effects on his own and his pregnant partner's health behaviors. Further, no studies have explored whether experiences of stress can crossover and affect a romantic partner's health behaviors among adolescents and young adults who are expecting a baby.

The current study aims to fill these gaps in the literature by examining how both personal and partner experiences of stress are associated with poor health behaviors during pregnancy among a sample of expectant adolescent and young adult couples who are largely racial and/or ethnic minorities and have a low socioeconomic status. First, I describe expectant parents' experiences of stress during pregnancy across several domains (e.g. personal hardship, close relationship stressors, neighborhood problems and discrimination). Second, drawing from stress and coping theory, I describe the association of these experiences with negative health behaviors and mental health (substance use, conduct problems and depressive symptoms). Third, I draw upon stress and strain crossover theory to explore partner effects—the association between a *partner's* experiences of stress with one's own poor health behaviors and mental health.

b. Methods

b.1 Data Source

The current study is a secondary cross-sectional data analysis of baseline data collected between 2007 to 2011 from 296 expectant young couples (females ages 14–21 years and their male partners ages 14+ years) enrolled in a longitudinal study of relationships and health during the transition to parenthood. Detailed study procedures are published elsewhere[203] and within the previous chapter. In short, young women and men in a romantic relationship and expecting a baby were recruited from four urban university affiliated hospital-based clinics in southern Connecticut (CT) (Yale University Women's Center and ultrasound clinic, Bridgeport Hospital OB/GYN clinic, New London OB/GYN clinic, and Hospital of St. Raphael OB/GYN clinic). The couples completed separate audio computer-assisted self-interviews (A-CASI), which allows participants with low literacy to complete the survey [204] and elicits more accurate and valid responses to sensitive questions.[205,206] Of the 413 eligible couples screened, 72.2% enrolled. Compared to those who refused to participate, participants were on average two weeks further along in pregnancy at screening ($P < 0.03$). Participants versus those who refused participation did not vary by any other pre-screened demographic characteristic (all $P > 0.05$).

A research assistant obtained informed consent from the each member of the couple (individually) at the baseline survey. Participation was voluntary, confidential, and did not influence the provision of health care or social services. All procedures were approved by the Yale University Human Investigation Committee and by Institutional Review Boards at study clinics. IRB approval to use the deidentified PARTNRS data was also obtained from the CUNY Graduate Center.

b.2 Measures

Stressors

Stressful life events related to *close relationships* and *personal hardship* were evaluated by adapting the Life Events Scale.[151] Respondents indicated whether they had experienced 11 stressful life events in the previous 6 months. Four stressful life events, including broke off a steady relationship, a relative suffered a serious illness, injury or assault, a family member or close friend died and had a serious problem with a friend, neighbor, or relative, were grouped and summed as *events related to close relationships*. Seven stressful life events, including having money problems, being unemployed, moving, having something lost or stolen, problems at work or school, problems with the police, and suffered a serious illness, injury or assault, were grouped and summed as *events related to personal hardship*. Higher scores on this measure indicate the respondent experienced more stressful life events.

Respondents' perception of *neighborhood problems* was assessed using a 15-item adapted version of the Perceived Neighborhood Problems Scale.[207] Respondents indicated how much various neighborhood problems were an issue in their neighborhood, on a 3-point scale ranging from 1="not a problem" to 3="serious problem." Sample items from the original scale include "smells and fumes," "assault and muggings," and "vandalism." Two additional items were added to the original 13-item scale: "feeling unsafe after dark" and "drugs." Responses to items were summed to form a total *neighborhood problems* scale ranging from 15 to 45 (= .95).

Perceived *general discrimination* was assessed using a 20-item adapted version of the Daily Life Experiences Scale, a subscale of the Racism and Life Experiences Scales.[208] Items concerned how often respondents experienced discriminatory treatment, such as not being given service in a store or restaurant, or being stared at by strangers. Responses were indicated on a 6-point scale ranging from 0="Never" to 5="Once a Week or More." A mean score was calculated from the 20 items to form the *general discrimination* score (= .93).

Health Behavioral Risk

Smoking, drinking, marijuana use and hard drug use were measured using an adapted, 7-item version of the Recreational Drug Use Scale.[153] Frequency of use during the past three months for each substance (alcohol, cigarettes, marijuana, crack, heroin, methamphetamines, and "other hard drugs") was assessed using a 5-point Likert scale, ranging from 0 = "Never" to 4 = "Every Day." The adapted version included the item "other hard drugs" in lieu of the individual items in the original scale of barbituates, ectasy, gammahydroxybutyrate (GHB), hallucinogens and inhalant nitrates. We summed the report of the use of crack, heroin, methamphetamines, and "other hard drugs," to form a total *hard drug use* score (range 0 to 16) due to the low frequencies of these individual items.

Conduct problems were assessed by means of an adapted, 7-item version of the DSM Conduct Problems Scale.[209] Respondents reported the frequency of various conduct problems in the previous 6 months on a 4-point scale ranging from 1= "Not at All" to 4="5 or more times." Sample items included "skipped school or work," "got in a fight," and "stole something." Items were summed to form a total conduct problems score ranging from 7 to 28, with higher scores indicating more conduct problems.

Mental Health

Depressive symptoms over the past week were measured using 15 of the 20 items in the Center of Epidemiological Studies-Depression Scale (CES-D).[91] Participants responded on a 4-item scale ranging from 0="Less than 1 day" to 3="5-7days". Items included "during the past week I had crying spells" and "during the past week I felt depressed."

b.3 Statistical Analysis

I produced descriptive statistics using IBM SPSS Statistics V22 (IBM Corporation, Armonk, NY) of the demographic characteristics, stressors and behavioral risk outcomes among the sample population. Two men were missing data for stressful life events and therefore I excluded two couples from the analysis resulting in a final sample of 294 couples (n = 588). I used paired t-tests and McNemar's tests to

compare the demographic characteristics, stressors and behavioral risk outcomes variables between paired men and women.

I used multilevel modeling to explore the relationship between experiences of stressors and the behavioral risk outcomes during pregnancy: smoking, drinking, marijuana use, hard drug use, conduct problems and depressive symptoms. Specifically, I used the Actor-Partner Interdependence Model (APIM), to account for the correlated nature of the data. This model allowed me to assess the influence of both the respondent (actor effect) and their partner (partner effect). An actor effect indicates whether a respondent's score on a predictor variable is associated with their own outcome (e.g. woman's experiences of stressors relates to her own smoking). A partner effect indicates whether a respondent's partner's score on the predictor variable is associated with the respondent's outcome (e.g., male partner's experiences of stressors influences his female partner's smoking). The APIM uses a single analysis to incorporate responses from both members of a couple and treats the members of a couple as nested scores within the same group.[210] A detailed description of APIM analyses using multilevel modeling programs by Kenny, Kashy, & Cook (2006) served as the guide for our analysis plan. Analyses involving hard drug use were restricted to the male data because no females reported hard drug use. To assess whether gender moderated the influence of stressors on all other health behavior outcomes, gender by stressor interaction terms were tested.

All models controlled for maternal and paternal age, education, income and race/ethnicity. In addition, analyses controlled for role occupancy (defined in this analysis as whether they worked, went to school or had other children) because people who have greater role occupancy are likely exposed to more stressors.[81]

c. Results

c.1 Descriptive Statistics

Demographic characteristics of the participants are displayed in Table IV-1. The young men were generally older, had more personal income, were more likely to be employed, and were less likely to be in school compared to their female partners.

Table IV-1 also shows that young men and women reported similar amounts of stressful life events related to close relationships and stressful life events related to personal hardship (both P>.05). Young men reported more neighborhood problems (22.4% vs. 24.4%, P<.001) and more general discrimination (M=0.9 vs. M=1.0 out of 5, P=.02) compared to young women. Table IV-2 shows that money problems were the most common life event stressor in the past six months among both men and women. About one third of the respondents also reported moving within the past six months.

Table IV-1. Demographic characteristics, stressors and outcomes from baseline survey.

	Women		**Men**		**McNemar's Test**
	%	**(N)**	**%**	**(N)**	**P**
Demographics					
Employed	28.40	(84)	60.70	(179)	<0.001
In School	39.50	(117)	26.90	(79)	<.001
First Child	21.00	(62)	24.30	(71)	NS
Race/Ethnicity					
Black	39.50	(117)	48.60	(144)	<.001
Hispanic	39.50	(117)	36.50	(108)	
White	16.90	(50)	10.50	(31)	
Other	4.10	(12)	4.40	(13)	
	Mean	**(SD)**	**Mean**	**(SD)**	**Paired T-Test**
Age	18.71	(1.63)	21.33	(4.06)	<.001
Years School	11.75	(1.82)	11.84	(1.89)	NS
Personal Income ($)	5846	(7458)	10927	(11878)	<.001

Stressors					
Personal Hardship Stressors (out of 7)	1.46	(1.34)	1.66	(1.63)	0.07
Close Relationship Stressors (out of 4)	0.63	(0.94)	0.66	(0.93)	NS
Neighborhood Problems (on scale from 15-25)	22.41	(7.54)	24.39	(8.35)	<0.001
General Discrimination (on scale from 0 to 5)	0.85	(0.81)	1.02	(1.01)	0.02
Outcomes					
Substance Use Past 3 months (0=never to 4=every day)					
Smoking	0.36	(0.95)	1.13	(1.47)	<.001
Drinking	0.05	(0.24)	0.85	(0.98)	<.001
Marijuana Use	0.07	(0.38)	0.81	(1.28)	<.001
Hard Drug Use	--	--	0.25	(1.25)	--
Conduct Problems (on a scale 7-28)	24.03	(3.50)	24.77	(3.56)	.005
Depressive Symptoms (on a scale from 0 to 45)	10.53	(7.38)	8.88	(6.62)	.002

Table IV-2. Frequencies of individual life event stressors in past 6 months among men and women reported at baseline.

	Women	**Men**	**McNemar's Test**
	%	%	P
Personal Hardship Stressors			
Money Problems	44.6	45.2	.92
Being Unemployed	26.0	33.3	.04
Moving	35.8	29.3	.07
Having something lost or stolen	16.6	22.4	.09
Problems at work or school	13.2	12.2	.80
Problems with police	4.7	13.9	<.001
Suffered illness, injury, assault	4.7	9.2	.05

Close Relationship Stressors			
Broke off steady relationship[8]	26.0	7.1	.06
Relative suffered illness, injury assault	17.6	16.7	.81
Family member or close friend died	24.0	26.2	.49
Serious problem with friend, neighbor, relative	17.2	16.3	.82

c.2 Multilevel Regression Analyses

Table IV-3 shows the results of the multilevel regression models examining the association between the stressors and the outcomes. Each outcome was tested in separate models controlling for all demographic characteristics. The results below describe the results of the gender interaction analyses. Because many of the outcome variables did not have a normal distribution, I also ran multilevel linear regression models with natural log transformed outcomes. The tables are shown in Appendix III-3. The results were substantively the same so only the results from the linear regression models are shown in the main text.

[8] This item refers to any relationship, including the current relationship. Each individual provided his/her own response. Discrepancy in the couples percentages here indicate that participants may have had other relationships in the previous six months and/or may not perceive a "break-up" the same way.

Personal Hardship Stressors and Health Behaviors and Mental Health

Among the total sample, in adjusted models greater frequency of personal hardship stressors predicted more smoking (B=.08, SE=.04, t=2.09, p=.04), marijuana use (B=.04, SE=.02, t=1.90, p=.06), conduct problems (B=.45, SE=.11, t=4.26, p<.001) and depressive symptoms (B=0.41, SE=0.22, t=1.87, p=.06) (Table IV-3). Gender interacted with personal hardship stressors when predicting marijuana use (t=1.96, P=.05) and alcohol use (t=1.97, P=.05). Greater frequency of personal hardship stressors was associated with more marijuana use (B=.14, SE=.05, t=2.76, P=.006) and alcohol use (B=.10, SE=.04, t=2.817, P=.005) among young men only. Gender also interacted with *partner's* personal hardship stressors when predicting marijuana use (t=2.66, P=.008) and depressive symptoms (t=-2.11, P=.04). Greater frequency of *partner's* personal hardship stressors was associated with less marijuana use (B=.13, SE=.05, t=-2.48, P=.014) and more depressive symptoms (B=0.77, SE=.28, t=-2.79, P=.006) among young men only.

Close Relationship Stressors and Health Behaviors

Gender interacted with close relationship stressors when predicting smoking (t=2.096, p=.037) and marijuana use (t=2.92, p=.004). Greater frequency of close relationship stressors predicted more smoking (B=.22, SE=.09, t=2.44, p=.015), marijuana use (B=.30, SE=.08, t=3.58, p=<.001) and hard drug use (B=.34, SE=.09, t=3.81, p<.001) among young men only. Gender also interacted with *partner's* close relationship stressors when predicting conduct problems (t=2.1, P=.04). Greater frequency of *partner's* close relationship stressors related to more conduct problems among young women only (B=.58, SE=.20, t=2.88, p=.004).

Neighborhood Problems and Health Behaviors

Among the total sample, in adjusted models greater frequency of neighborhood problems predicted more smoking (B=.02, SE=.01, t=2.94, P=.001) and depressive symptoms (B=.07, SE=.04, t=2.00, P=.047) . Gender interacted with neighborhood problems when predicting smoking (t=2.09, P=.037), alcohol use (t=2.63, P=.009), marijuana use (t=3.30, P=.001) and neighborhood problems (t=2.42,
P=0.16). Greater frequency of neighborhood problems predicted more smoking (B=.04, SE=.01, t=3.89, P<.001), alcohol use (B=.02, SE=.007, t=3.035, P=.003) and marijuana use (B=.03, SE=.008, t=3.77, P<.001) among young men only. Greater frequency of neighborhood problems predicted more depressive symptoms (B=.12, SE=.04, t=2.71, P=.007) among young women only. Gender interacted with *partner's* neighborhood problems when predicting smoking (t=-2.07, P=.039). Greater p*artner's* neighborhood problems related to less smoking among young men only (B=-.02, SE=.01, t=-2.02, P=.04).

General Discrimination and Health Behaviors

Among the total sample, in adjusted models greater frequency of general discrimination predicted more conduct problems (B=1.17, SE=.16, t=7.35, p<.001) and more depressive symptoms (B=1.41, SE=.33, t=4.27, P<.001). Gender interacted with general discrimination when predicting alcohol use (t=2.63, P=.009) and depressive symptoms (t=-2.54, P=.01). Greater frequency of general discrimination predicted more alcohol use (B=.15, SE=.06, t=2.652, P=.008) and hard drug use (B=.22, SE=.08, t=2.82, P=.01) among young men only. Greater frequency of general discrimination predicted more depressive symptoms among both young men (B=2.68, SE=.56, t=4.81, P<.001) and young women (B=.86, SE=.38, t=2.29, P=.02) although the effect was much stronger for men than women.

Table IV-3. Multi-level linear regression models examining relationship between stressors (own and partner's) and behavioral risk and depressive symptoms. All models control for age, education, income, race/ethnicity, parity and employment status.

	Smoking			Drinking			Marijuana Use			Hard Drug Use[a]			Conduct Problems			Depressive Symptoms		
	B	SE	t	B	SE	t	B	SE	t	B	SE	t	B	SE	t	B	SE	t
Personal Hardship Stressors																		
Actor	**0.08***	**0.04**	**2.09**	0.02	0.01	1.37	**0.04**‡	**0.02**	**1.90**	-0.02	0.06	-0.34	**0.45*****	**0.11**	**4.26**	**0.45***	**0.22**	**2.01**
Partner	-0.04	0.04	-1.11	-0.02	0.01	-1.58	-0.02	0.02	-0.98	-0.02	0.07	-0.24	0.09	0.10	0.84	0.34	0.23	1.52
Close Relationship Stressors																		
Actor	0.00	0.05	-0.01	0.02	0.02	1.27	0.04	0.03	1.75	**0.34*****	**0.09**	**3.81**	0.26	0.15	1.68	0.49	0.33	1.49
Partner	-0.01	0.06	-0.12	0.00	0.02	-0.24	0.02	0.03	0.94	-0.08	0.09	-0.96	0.23	0.15	1.48	0.50	0.33	1.54
Neighborhood Problems																		
Actor	**0.02*****	**0.01**	**2.94**	0.00	0.00	0.27	0.01	0.00	1.63	0.00	0.01	-0.20	0.02	0.02	1.24	**0.07***	**0.04**	**2.00**
Partner	0.00	0.01	-0.34	0.00	0.00	-1.50	0.00	0.00	-0.92	0.00	0.01	-0.34	-0.01	0.02	-0.37	-0.04	0.04	-1.06
General Discrimination																		
Actor	-0.01	0.06	-0.09	0.02	0.02	0.94	0.03	0.03	0.91	**0.22****	**0.08**	**2.82**	**1.17*****	**0.16**	**7.35**	**1.39*****	**0.33**	**4.21**
Partner	0.06	0.05	1.17	-0.01	0.02	-0.83	-0.01	0.02	-0.60	0.07	0.11	0.66	0.10	0.16	0.61	-0.16	0.35	-0.47

* P<.05 ** P≤ 0.01 *** P≤ 0.001 ‡ P=.06 [a]Only reported for men

Table IV-4 provides a description of the significant associations between one's own and one's partner's experiences of stressors and behavioral risk among the young men and women within couples.

Table IV-4**.** Descriptive table of significant associations between stressors and behavioral risk among couples.[a]

Stressor		**Women**	**Men**
↑ **Personal Hardship Stressors**	Own	↑ conduct problems ↑ smoking ↑ depressive symptoms	↑ conduct problems ↑ smoking ↑ drinking ↑ marijuana use ↑ depressive symptoms
	Partner's		↓ marijuana use ↑ depressive symptoms
↑ **Close Relationship Stressors**	Own		↑ smoking ↑ marijuana use ↑ hard drug use
	Partner's	↑ conduct problems	
↑ **Neighborhood problems**	Own	↑ depressive symptoms	↑ smoking ↑ drinking ↑ marijuana use
	Partner's		↓ smoking
↑ **General Discrimination**	Own	↑ conduct problems ↑ depressive symptoms	↑ conduct problems ↑ drinking ↑ hard drug use ↑ depressive symptoms
	Partner's		

[a] Examples of how to read this table: Greater frequency of partner's personal hardship stressors associated with greater depressive symptoms among men. Greater frequency of one's own experiences of discrimination associated with own depressive symptoms among men and women.

d. Discussion

The findings of this study demonstrate that one's own experiences of several types of stressors are related to substance use, conduct problems and depressive symptoms among both expectant women and men. Negative health behaviors common during adolescence and young adulthood predict future patterns of behavior and health outcomes into adulthood. These behaviors are also important due to their capacity to also affect the health of their baby.

The evidence from this study also concurs with the stress and strain crossover theory, in which stressful experiences in one's own life, cross over and affect the health and well-being of a close partner.[72] While several studies have demonstrated that maternal stress is associated with poor maternal health behaviors during pregnancy,[46,139] this study is the first to show that *paternal* experiences of stress are predictive of maternal conduct problems. Previous studies examining the patterns and predictors of maternal health behaviors have largely neglected paternal influences, despite increasing evidence that social relationships influence health behaviors.[211]

Personal experiences of stress and one's own health behaviors

This study identified several domains of stress that were associated with behaviors among young men becoming fathers. Notably, greater personal experiences of all sources of stress (relationship stressors, personal hardship stressors, neighborhood problems and discrimination) were associated with more substance use among the young men in this study. While most research has focused on predictors of maternal health behaviors, understanding the predictors of *paternal* health behaviors has important implications not only for his health, but for his pregnant partner's health as well. Men's negative health behaviors, such as smoking, can directly influence maternal health (e.g. by

increasing her exposure to second hand smoke) and men's health behaviors can influence his partner's health behaviors. For example, studies have shown that women are less like to quit smoking during pregnancy if her partner smokes.[212] Programs and interventions that aim to reduce substance use among young expectant mothers may be more effective if the substance use of *both* parents is addressed.

Among the young women in this study, however, significant associations between stress and substance use were sparse. I did find, however, that experiences of personal hardship stressors were associated with more smoking among women. The lack of consistent associations between maternal stress and substance use in this study may be an artifact of the low prevalence of the report of substance use among the women. These results, however, may show that the stressors that affect paternal and maternal substance use during pregnancy may be different. Previous research has shown that different types of stressors predicted smoking among adolescent girls compared to boys.[213] Previous research has shown that young men and women may use different coping mechanisms to deal with stress[166,214] and the evidence from this study may suggest that young expectant men use substance use as a coping strategy for stress more often than young expectant women.

Partner's experiences of stress and one's own health behaviors

A majority of previous evidence supporting the stress and strain crossover theory has found negative effects of stress and strain on a partner's well-being.[169] Contrary to this evidence and our hypothesis, all of the significant effects of the young men's partner's stress (i.e. the association between women's stress with her male partner's behaviors) were associated with *less risk* behavior and *more protective* behavior. Young women's personal hardship stressors were significantly associated with less marijuana use among her male partner, and more women's neighborhood problems were

significantly associated with less smoking among her male partner. This study, however, found that young men's depressive symptoms were directly associated with his partner's personal hardship stressors. This evidence is consistent with the theory of empathetic distress in which a person takes on the experiences of stress and distressed emotions of his/her partner and experiences them as one's own."[199]

These findings suggest that not all experiences of stress necessarily translate into negative effects on a partner. Popular culture may portray young expectant women's partners only as sources of stress or complication; however, the findings from this study suggest that young men who see that their partner is under significant stress, may improve their health behaviors for their partner's benefit and may empathize with their partner's troubles to the point that they take on the distressed emotions as their own. For all of the negative portrayal of young fathers, they can be an important source of support[215] and fathers may have a meaningful influence on the health behaviors of their pregnant partners.[216]

Strengths, Limitations and Future Research Directions

This secondary data analysis has several limitations. This study was cross-sectional and therefore experiences of stress and behavioral risk were assessed at the same point in time limiting our ability to infer causation. The timeframes referenced by each question, however, make the direction of the hypothesized association plausible. The risk behavior items referred only to behaviors in the previous 3 months. Both personal hardship and close relationship stressors referred to experiences within the past six months. While neighborhood problems and general discrimination were more general questions referring to their daily life, these constructs are likely consistent over time.

Also, pregnant women reported few negative health behaviors in this study during pregnancy. Therefore, the association between experiences of stress and behavioral risk among the women in this sample may be spurious; regardless, I was able to identify a few significant relationships between stress and health behaviors among the women.

Despite these limitations, this study is one of the few that includes a direct report from men of their experiences of stress during their partner's pregnancy and its relationship to risk behavior. In addition, this study includes an assessment of stressors from multiple sources and the distinct relationships with behavioral risk outcomes across these predictors for both men and women. This study also assessed the influence of a partner's experience of stress on behavioral risk, which very few studies, if any, have done. In addition, this study assessed stress crossover from both sides of the couple—many studies just focus on crossover from one member of the couple to the other.[169]

In conclusion, this study filled important gaps in the literature on the factors influencing the health behaviors of young couples expecting a baby. The findings demonstrate that experiences of stress across multiple life domains are associated with both maternal *and paternal* health behaviors among young couples during pregnancy. Interventions that address healthy coping mechanisms among this population may help reduce these unhealthy behaviors. Programs and interventions targeting prenatal health behaviors (particularly among adolescents and young adults) overwhelmingly neglect young male partners of the expectant young woman. These findings indicate that stress is associated with young men's health behaviors during this time. These health behaviors have important implications for their health into adulthood and for the health of their partner and child.

This research also revealed that young women's experiences of stress can crossover and impact the health behaviors of her romantic partner—but, not in the expected negative direction. The more stress a young expectant woman experienced in multiple domains, the less risk behavior her young male partner reported. The male partners of young expectant women can be an important source of

support and may have a significant influence on the health of their pregnant partners. It is critical that programs and interventions aimed at improving young women's prenatal health behaviors include romantic partners, when feasible and desired by both members of the couple, and address the importance of the influence of this relationship on their own and their baby's health.

Chapter V. *Conclusion*

This dissertation tested dyadic models of the association between both maternal and paternal reports of relationship quality and stress during pregnancy with prenatal health behaviors and birth outcomes. It is the first research to assess the effect of direct report of paternal experiences of stress and relationship quality on birth outcomes. It is also the first research of its kind to use dyadic data analysis methods to parcel out the independent and interactive effect of each parent among couples on birth outcomes—particularly among young couples who I hypothesized may be particularly susceptible to stress and its effects on birth and child outcomes.

The first paper in this dissertation demonstrated that father's report of conflict with his partner and his presence at birth were both significantly associated with having a baby with a lower birth weight and an earlier gestational age at birth among a national sample of married and unmarried parents in a relationship. The magnitude of the effect of the father's presence at birth was similar to that of light smoking during pregnancy. This is the first study to demonstrate an association between direct *paternal* reports of relationship conflict and birth outcomes. Research examining the impact of fathers on birth outcomes has largely been limited to demographic factors (age, race, etc.), and maternal reports of paternal involvement and support, and the measures of these constructs are almost always very crude (e.g. father's name on birth certificate).[68,217]

This paper also found an interactive effect of maternal and paternal reports of relationship conflict on birth outcomes. Average birth weight was the lowest when both parents reported high levels of conflict with their partner. Low levels of conflict as reported by mothers were protective. When mothers perceived low levels of conflict, the father's report of conflict did not have an effect on birth weight; however, when mothers reported high levels of conflict, greater paternal report of conflict was associated with worse birth outcomes.

Consistent with previous studies finding that maternal report of paternal support during pregnancy was positively associated with birth outcomes, this paper found that the baby's father's presence at the birth predicted that their babies weighed 98.8g more at birth and had an average of 3.5 days longer gestation. The baby's father's presence at birth may be a crude indicator of his support of his partner and his involvement with the pregnancy. This finding is consistent with the theory posed by Alio and colleagues (2010) in which support from the baby's father during pregnancy may decrease maternal stress and encourage healthy behaviors, ultimately leading to better birth outcomes.[68] This finding may indicate that we may be able estimate population level effects of paternal support by using paternal attendance at the baby's birth as a proxy within analyses of nationally representative surveys, since it is a simple measure to employ.

The second paper in this dissertation did not find an association between maternal report of stress during pregnancy with either gestational age at birth or birth weight among a sample of 296 young expectant couples. The analysis did find, however, that men's experiences of stress were *positively* associated with gestational age at birth and birth weight (marginally significant), both before and after controlling for important confounders. This finding contradicted my hypothesis that men's stress would be negatively associated with birth outcomes; however, the finding does suggest that men's experiences during pregnancy matter to birth outcomes.

The results of the analyses in this paper are more consistent with the "Tend and Befriend" model of the female stress response.[164,165] This model suggests that under conditions of stress women are likely to increase their support-seeking behaviors from others, including significant others. This support seeking (also called affiliation behavior) may help reduce women's feelings of stress. Research the female neuroendocrine response to stress suggests that after the initial fight or flight response to stress, the release of oxytocin ("the love drug") is greater among females than males.[165] The increase in

oxytocin may enhance affiliation behavior, reduce feelings of stress among women and ultimately lead to better birth outcomes. On the other hand, this affiliation behavior may increase her partner's stress as she leans on him for support.

Figure V-1 is a depiction of an alternative conceptual model of how maternal and paternal stressors are associated with birth outcomes based upon the "Tend and Befriend" model of the stress response among women. The paths depicted in Figure V-1 may explain the positive effect of paternal stress on birth outcomes. Under conditions of stress, expectant mothers may seek support from the father of their baby, which may cause him additional stress, but alleviate some of her stress, which would ultimately lead to better birth outcomes.



Figure V-1. Conceptual model of the positive effect of paternal stress on birth outcomes based on the "tend and befriend"[164] model of the maternal stress response.

The third paper in this dissertation found that experiences of several domains of stress were associated with greater health risk behaviors and outcomes, including substance use, conduct problems, unprotected sex and depressive symptoms, among young expectant couples. This finding concurs with vast previous research demonstrating the same effect among adolescents.[143,173–179,182,183,191–194,218–221] The results from this analysis contradicted my hypothesis that a partner's experience of stress could crossover and negatively affect one's own health and health behaviors, based on stress and strain crossover theory.[222] The results showed that all of the significant effects of the young men's partner's stress were associated with *less* risk behavior and *more* protective behavior. This analysis also found that young men's depressive symptoms were directly associated with his partner's personal hardship

stressors, a finding that is consistent with the theory of empathetic distress in which one partner takes on the experiences of stress and distressed emotions experiences it as one's own."[199] For all the negative portrayal of young expectant women's partners, the results of this analysis suggest that young men who see that their partner is under significant stress, may empathize with their partner's troubles and may improve their health behaviors for the benefit of their partner and their new baby.

Key Finding #1: Father's experiences matter to the health of the unborn child

Together, the findings from this dissertation research suggest that father's experiences during his partner's pregnancy matter to the health of an unborn child. Over the past decade there has been increasing focus on supporting father involvement in order to promote child health and wellness, and a new call to promote investigation into paternal effects on birth outcomes[67,223,224] and paternal involvement during the perinatal period.[224,225] For example, the National Healthy Start Initiative, whose mission is to advocate "for health equity, services, and interventions that improve birth outcomes and family wellbeing," has focused in recent years on ensuring inclusion of fathers in their programs and promoting research that examines the impact of father involvement on birth outcomes and child health.[224]

Many studies have found evidence that father involvement is associated with birth outcomes.[68,102,217,226] This dissertation research went beyond prior studies that have assessed father involvement by maternal report of father's behavior (such as his financial contributions or other support or whether the father's name is birth certificate). This dissertation research treated men's experiences during pregnancy, including experiences of stress and relationship quality, with equal weight to women's experiences when it came to their impact on birth outcomes. The findings from this research suggest that men's experiences during the transition to parenthood are associated with birth

outcomes—in some circumstances with positive effects and others with negative effects. The sizes of the effects of paternal experiences during his partner's pregnancy were not negligible, either. This research found that babies born to men who reported the highest level of conflict were nearly 70 grams lighter at birth than babies born to fathers who reported the lowest level of conflict. Additionally, babies born to fathers that were not present at their child's birth were nearly 99 grams lighter at birth. Paternal stress was not associated with birth outcomes in the expected negative direction among young couples. Babies born to fathers with the highest levels of paternal stress weighed, on average, over 113 grams *heavier* at birth than babies born to fathers with the lowest level of stress. The average negative effect of *light* smoking during pregnancy in birth weight is 160 grams,[130] which demonstrates that the effect sizes found in these analyses are meaningful. The stress and coping framework[227] as well as the stress and strain crossover theory[222] both suggest that experiences of stress should have been negatively associated with health generally, and birth outcomes in particular. The positive effect of men's stress on birth outcomes coupled with the lack of effect of maternal stress on birth outcomes, however, suggests that there may be an alternative model for how parental stress processes among expectant couples influence birth outcomes. The "Tend and Befriend"[164] model of the female stress response may better fit the findings in this dissertation. This model of the stress response suggests that under conditions of stress, women are more likely than men to affiliate with others and seek social support. Men are more likely to display behaviors that are fightor-flight related in response to stress, such as substance use. In fact, the final paper in this dissertation found that association of experiences of stress with substance use were much more common among expectant fathers than mothers. Under conditions of stress, the expectant mothers in this study may have sought out substantial support from the father of their baby, which may have benefitted her wellbeing and ultimately the baby's health. This support seeking, however, may have come at the cost of increasing her partner's stress as she leaned on

him for support. While support seeking was not measured in the dataset used for this analysis, post-hoc analyses did find that women's stress was significantly associated with her attachment anxiety, which was in turn significantly correlated with her partner's stress.

It is noteworthy that the effects of father's report of relationship quality and his involvement among men in the Fragile Families population were in the expected direction: babies born to father's who reported the highest level of relationship conflict were born earlier and smaller, and babies born to fathers who were present at the birth were born later and bigger. Men in the Fragile Families study were generally older (average age was 29.7) and weighting of the dataset made the data representative of births to married and unmarried couples in large U.S. cities. The effects of father's reports of stress among men in the PARTNRS study were in an unexpected direction: greater stress was related to longer gestation and greater birth weight. Men in this study were younger (average age was 21.3) and were unmarried. It may be that young unmarried men who are expecting a baby are less equipped developmentally to deal with the stress of the pregnancy and his partner's support needs compared to older men. Young men who report the most stress may be providing the most support for his expectant partner, which may be indicative of a healthier and more committed relationship (which would ultimately support a healthier pregnancy) than young men who are less engaged and less stressed as a result. Older men who have had many more years to develop psychosocial skills may be less stressed than younger men by the support needs of his expectant partner. The stress that an older man reports about a relationship may be indicative of the most unhealthy relationships, which would lead to a less healthy pregnancy and more negative birth outcomes.

Key Finding #2: Parental relationships are associated with birth outcomes

Relationship quality has been associated with a variety of health outcomes, including cardiovascular disease,[99] inflammation[100] and impaired immune function.[100] The findings from this dissertation concur with previous research demonstrating that relationships can influence health by buffering, causing or exacerbating stress.[211] In addition, the findings extend the literature by demonstrating that relationship quality was associated with birth outcomes among a national sample of married and unmarried couples. This research showed that relationship dynamics that caused or exacerbated stress—notably couple conflict—were negatively associated with birth outcomes. Further, a marker of relationship quality and paternal support and involvement—whether the father's name was on the baby's birth certificate—was also positively associated with birth outcomes at a level that was nearly commensurate with the effect of light smoking on birth outcomes.

This research also found that there was an interactive effect of parental reports of relationship conflict on birth outcomes: the average birth weight was the lowest when both parents reported high levels of conflict with their partner. The results also showed that the mother's report of conflict was protective—when mothers perceived low levels of conflict, the father's report of conflict did not have an effect on birth weight; however, when mothers reported high levels of conflict, the greater the father's the report of conflict the worse it was for the baby. Our nation has spent the last several decades focusing on changing *maternal* behaviors during pregnancy (e.g. smoking during pregnancy and attending prenatal care) to improve population rates of low birth weight and preterm birth with little luck. This research suggests that the parental relationship and the experiences of both partners during the pregnancy have unique and important contributions to poor birth outcomes. Programs and policies that not only address the importance of healthy romantic relationships, but that also include both members of an expectant couple, may help support healthier pregnancies and lead to better birth

outcomes.

Key Finding #3: Young expectant couples experience high levels of stress in their lives

There has been very little research exploring young expectant adolescents' experiences of stress during pregnancy. In fact, young expectant fathers' experiences in general during his partner's pregnancy have largely been ignored, despite the fact that his partner's pregnancy is also a major life transition for him. As if the transitions to adulthood and parenthood were not stressful enough in and of themselves, the young couples from the PARTNRS study also reported experiencing many stressors during the pregnancy, ranging from individual experiences (e.g. job loss), interpersonal exposures (e.g. conflict in a steady relationship), neighborhood conditions (e.g. crime in neighborhood), to societal context (e.g. racism).

Nearly half of all PARTNRS women and men reported problems with money in the previous 6 months, and one-third of the young men reported being unemployed as a stressor. Over one-third of the young women reported moving within the previous six months. In a post-hoc analysis of the PARTNRS data, over 75% of the young men and women experienced at least one (out of eleven) stressful life events in the previous 6 months. Seventy-nine percent of young men and women reported experiencing discrimination in their daily lives. Over 78% of men and 75% of young women reported at least one minor or serious neighborhood problem (out of fifteen), including assault and muggings and feeling unsafe after dark.

When developing and implementing programs and policies that may help improve relationships and mitigate stress during pregnancy, practitioners must always consider that the main focus of the program maybe not ultimately be the main stressor or focal point in the participants' lives. Adolescents and young adults who are racial and/or ethnic minorities, live in urban areas and are from a low socioeconomic status (SES), are disproportionately affected by severe and chronic stressors, such as financial stressors, neighborhood problems, racism and discrimination.[38] Programs and policies that fail

to address these fundamental issues may not see success in improving outcomes because they fail to incorporate what may be the main drivers of the outcomes in the first place. Even worse, programs and policies that do not address these fundamental issues may inadvertently cause unexpected negative outcomes.

Key Strengths

While there is substantial previous research exploring the effect of maternal stress on birth outcomes, this dissertation was the first to explore the effect of *paternal* stress on birth outcomes, and the pathways through which he has an effect. This analysis assessed direct report of stress exposures and responses from the fathers, avoiding measurement error associated with using maternal reports of paternal experiences. This analysis also explored multiple sources of stress in an effort to parcel out which stressors had an effect on birth outcomes. This analysis was also the first to explore how multiple dimensions of relationship quality, beyond more crude measures such as marital status, affect birth outcomes among married and unmarried families.

The analytical techniques used in this research also strengthened the analyses. Each analysis accounted for the correlated nature of maternal and paternal reports, while maintaining the strength of the total sample size (i.e. without conducting the analyses separately by gender). In addition, one of the analyses used structural equation modeling, which allowed for the simultaneous assessment of multiple hypotheses involving complex pathways, while parceling out measurement error. Another analysis employed multilevel modeling (with the Actor Partner Interdependence Model[210] as a framework), which used a single analysis to incorporate responses from both members of a couple and treated the members of a couple as nested scores within the same group.

Key Limitations and Suggestions for Future Research

While this dissertation has many strengths, it is not without limitation. Because the analyses were all secondary, I was limited by the study design and the measures collected for both datasets (Fragile Families and PARTNRS). Neither study was nationally representative, although the Fragile Families study was a national sample that was representative of births in large U.S. cities. Therefore, the ability to generalize the findings may be limited to the populations studied.

Additionally, issues related to the timing of assessments were of concern in all analyses. In the Fragile Families study, parents' report of their relationship quality was assessed shortly after the birth of the baby, raising concern over the issue of reverse causality. For example, a poor birth outcome (having the baby earlier than 38 weeks) may cause parents stress, which may cause them to think and report more negatively about their relationship over the final month of pregnancy. In the PARTNRS study, experiences of stress and depressive symptoms were assessed at the same time point, limiting our ability to establish directionality in the analysis of whether depressive symptoms mediated the effect of stress on birth outcomes. These paths are guided by theory, however, and the time frames referenced by each measure make the direction of the effects plausible. The PARTNRS study, however, allowed for longitudinal assessment of the effects of stress on birth outcomes because the birth outcomes were collected from medical records, while the self-report of stress were ascertained during the second and third trimesters of pregnancy.

Another limitation is that the studies did not collect data on stress appraisal and perception. Future studies would be strengthened by the inclusion of stress appraisals and perceptions. What is stressful for one person may not be stressful for another, and therefore the likelihood of reporting a stressful event may be affected by an individual's appraisal of the stressor.[69] Measures of stress appraisals and perceptions could ascertain the individual's perception and evaluation of potential harm

posed by a specific external demand (i.e. stressor) and their ability to cope with the demand.[70] The inclusion of biological indicators of stress responses may also help show whether a stressor actually has a physiological effect on the expectant mother that could ultimately affect the health and development of the fetus.[14]

Another concern is whether there are important omitted variables that could explain the association between relationship quality and stress, with the birth outcomes. Unfortunately, due the limitations of the study designs and measures collected, we cannot separate out unmeasured confounding of the association between relationship quality and stressors with birth outcomes by some other parental characteristic (e.g. personality, depression) that would affect both the report of exposures and outcome. Given the substantial evidence that has documented an association between relationships quality and general health,[(e.g. 62,99,100)] and stress and birth outcomes[(e.g. 27,28,31–34,43)] the results from this this study are plausible; however, future studies that are longitudinal and collect measures of these other characteristics would strengthen the validity of the findings.

Implications for Future Research, Programs and Policies

Despite the importance of male partners during pregnancy, very little research has explored paternal influences on birth outcomes.[37] Research examining the effects of paternal factors on birth outcomes has been mostly limited to demographic factors (e.g. advanced age, race/ethnicity, etc.) and maternal reports of paternal involvement and support, and these measures are often crude (e.g. father's name on birth certificate).[68,217] Researchers and clinicians have almost entirely focused on how women's experiences, behaviors, and physical and mental health are associated with birth outcomes. This lack of inclusion of men in research during the antenatal period is reflective of the gender biases

that are evident in mainstream American culture and parenting norms.[228] American culture largely views pregnancy and child care as a women's responsibility.[228] As such, programs and policies are almost entirely focused on improving women's health and behaviors during pregnancy, with the female as the sole recipient of the intervention or target of the policy. By continuing to focus birth outcome research on women only, we may be inadvertently perpetuating this construction of pregnancy and child health as a largely maternal responsibility, while men are seen (and treated) as unimportant in their capacity to influence the health of their unborn child.[228] The results of this research demonstrate that men's experiences during pregnancy are important (and substantial) predictors of birth outcomes. As such, future research studies that investigate psychosocial influences on birth outcomes should include both maternal and paternal experiences.

Future investigations would be strengthened by inclusion of direct report from the expectant fathers so as to reduce measurement error associated with maternal report of paternal factors. Obtaining direct report from fathers may not be easy due to existing barriers to paternal engagement during the prenatal period. Due to cultural, institutional and policy biases around maternity care, men are marginalized at the outset of the prenatal period. Thus, future studies need to recruit men directly, not just through the mothers, and offer flexible hours or home visits for their participation in the research. Further, welcoming the expectant fathers personally and communicating the potential advances that may result from the fathers' participation in the research may go a long way in successful recruitment and retention of expectant fathers. The PARTNRS and Fragile Families studies used these strategies to maximize the engagement of the expectant and new fathers with great success.

Additionally, there should be parity in the data collected from expectant mothers and fathers (i.e. the same questions are asked of both parents), which would allow for the use of dyadic data

analysis methods, such as those employed in this dissertation. Dyadic data analysis methods can help parcel out the maternal, paternal and couple level effects on birth outcomes.

Because relationships, stress, mental health and other psychosocial factors are inherently affected by significant others, programs to improve birth outcomes and early child health that target only the expectant mother seem unlikely to be effective or effect change that is sustainable. Couplesbased programs to improve birth outcomes may be more effective than programs that include mothers only. There has been very little investigation into the effectiveness of couples-based interventions on improving birth outcomes. The Family Foundations' couples-based intervention for expectant parents is the only intervention, to my knowledge, that has been evaluated in its effectiveness in improving birth outcomes. Family Foundations is delivered in a group format and aims to provide psychosocial support and education, with the goal of preparing couples to enter parenthood together in a supportive manner.[229] When evaluated, Feinberg et. Al. (2015) found that among women with the highest levels of cortisol, the Family Foundation intervention reduced the incidence of adverse birth outcomes, including preterm birth and low birth weight.[229] The development and evaluation of theory- and evidence-based couples interventions may help improve the rates of adverse birth outcomes in the future.

Appendices

Appendix II-1. Variable descriptions and details.

Construct	Measure and Reference	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
Exposures: Relationship Quality						
Positive Couple Activities	Original to Fragile Families	4 items asked whether they had done positive activities with baby's father/mother (e.g. went out to a movie, helped each other solve a problem)	1=Yes 0=No	Baseline	Last month	-Responses summed to form an index -Higher scores correspond to more positive activities (range: 0-4) (α=0.64 w, 0.60 m)
Couple Conflict	Adapted from National Survey of Family Health[121]	6 items assessed frequency of disagreements about specific topics (e.g. money, sex, being faithful)	1= never 2= sometimes 3= often	Baseline	Last month	-Responses summed to form a continuous scale -Higher scores correspond to more disagreement/more conflict (range: 6-18) (α=0.65 w, 0.64 m)
Partner Support	Adapted from Multidimensional Support Scale (MDSS)[122,123] and Susan Loyd's Effects of Violence on Work and Family project.	4 items assessed frequency of supportive and destructive behavior toward respondent by the baby's father/mother (e.g., s/he is fair and willing to compromise, s/he insults or criticizes you or your ideas)	1= often 2= sometimes 3= never	Baseline	Current	-Responses summed to form a continuous scale -Supportive behaviors were reverse scored. -Higher scores correspond to more partner support (range: 4-12) (α=0.60w, 0.59 m)
Relationship Satisfaction	Original to Fragile Families	6 items ask how life might be different if they were married to the baby's father/mother (for unmarried) or not married to the baby's father/mother (for married) (e.g. financial security, happiness)	4-point scale ranging from 5=much worse to 1=much better	Baseline	Current	-Responses summed to form a continuous scale -Responses from unmarried respondents were reverse scored. -Higher scores correspond to more partner/relationship satisfaction (range: 6-30) (α=0.72 w,0 .67m)

BF present at birth	--	Asked baby's father whether he was present at the birth	1=Yes 0=No	Baseline	--	Dichotomous

Relationship Duration	--	Asked mothers years and/or months they knew the baby's father before the pregnancy	Months	Baseline	--	Continuous (range: 0-432)
Birth Outcomes						
Birth Weight	Weight at birth	--	Grams	Medical Records	--	Continuous (range : 470-5,585)
Gestational Age at Birth	Weeks pregnant at birth	--	Weeks	Medical Records	--	Continuous (range: 23-46)
Effect Measure Modifier						
Marital Status	--	Asked whether currently married to father of the baby	1=Yes 2=No	Baseline	Current	Dichotomous
Confounders (Maternal and Paternal)						
Age	--	Summary variable created by FF from birth date.	--	Baseline	Current	Continuous (range:15-43 women 15-53 men)
Household Income	--	Asks: "Thinking about your income and the income of everyone else who lives with you, what was your total household income before taxes in the past 12 months?"	1= < $5,000 2= $5,000 to $9,999 3= $10,000 to $14,999 4= $15,000 to $19,999 5= $20,000 to $24,999 6= $25,000 to $34,999 7= $35,000 to $49,999 8= $50,000 to $74,999 9= > $75,000	Baseline	Current	Categorical

Education	--	Asks the highest grade or year of regular school that they have completed.	1= < high school 2= high school/equiv 3= some coll, tech 4= coll or grad	Baseline	Current	Categorical
Race/Ethnicity	--	Asks which category best describes their race and ethnicity.	1= White 2= Black 3= Hispanic 4= Other	Baseline	Current	Categorical
MATERNAL ONLY						
Parity	--	From medical record *before* the index child was born.	--	Baseline & Medical Records	Current	Continuous (range: 0-12)
Paid for birth with	--	Payment for delivery	1=Yes	Medical Records	--	Dichotomous
Medicaid or was uninsured		indicated as Medicaid, partial Medicaid, Uninsured or other government program	0=No			
Smoking During Pregnancy	--	Mother smoked cigarettes during pregnancy, from all possible sources in the medical record	1=Yes 0=No	Medical Records	During Pregnancy	Dichotomous
Drug Use During Pregnancy	--	Mother used drugs during pregnancy, from all possible sources in the medical record	1=Yes 0=No	Medical Records	During Pregnancy	Dichotomous
Alcohol Use During Pregnancy	--	Mother used alcohol during pregnancy, from all possible sources in the medical record	1=Yes 0=No	Medical Records	During Pregnancy	Dichotomous
Trimester Prenatal Care Initiated	--	Variable constructed by FF that indicates the trimester prenatal care was initiated	1= First Trimester 2=Second Trimester 3=Third Trimester	Medical Records	During Pregnancy	Categorical

Mental Illness PrePregnancy	--	Mother had pre-pregnancy diagnosis of mental illness, from all possible sources in medical record	1=Yes 0=No	Medical Records	Pre-Pregnancy Diagnosis	Dichotomous
Pre-Existing Diabetes	--	Mother had pre-pregnancy diagnosis of diabetes, from all possible sources in medical record	1=Yes 0=No	Medical Records	Pre-Pregnancy Diagnosis	Dichotomous
Pre-Existing Hypertension	--	Mother had pre-pregnancy diagnosis of hypertension, from all possible sources in medical record	1=Yes 0=No	Medical Records	Pre-Pregnancy Diagnosis	Dichotomous
Time between Mother and Father Interviews	--	Days between parental interviews	Days	Baseline	After Delivery	Continuous (range: 0-32)

Appendix II-2. Measure details, validity and reliability

The following summary variables were created using items from the Fragile Families and Child Well Being Study Baseline Survey of Parents.[230]

Positive Couple Activities

The following 4 items comprising the positive couple activities measure were developed for the Fragile Families study. The 4 questions listed below asked parents whether they had done positive activities with the baby's father/mother in the last month or the last month they were together (1=Yes, 0=No). A total positive couple behavior score was created by summing the responses (α =0.64 mothers and 0.60 fathers; range 0-4).

> *I'm going to read you some things that couples often do together. Tell me which ones you and [BABY'S FATHER/MOTHER] have done together in the past month*
>
> 1. *visited with friends*
> 2. *went out to a movie, sporting event, or some other entertainment*
> 3. *ate out in a restaurant*
> 4. *helped each other solve a problem*

No specific validity information is provided by the principal investigators; however, this measure has been successfully employed as an indicator of relationship quality using Fragile Families data. A study among adolescents and young adults in the Fragile Families study used the four items assessing joint participation in activities together (KR20=.67 for fathers; KR20=.74 for mothers). More positive couple activities reported by the mother predicted more father involvement 3 years later.[231]

Couple Conflict

This measure was loosely adapted from the National Survey of Family Health.[121] Questions asked parents how often they had disagreements about six topics listed below. Parents responded on a

three point scale ranging from 3=often, 2=sometimes, 1=never. Responses were summed to form a continuous score, with higher scores indicating less conflict and more agreement in the relationship (chronbach's α= 0.65 mothers and 0.64 fathers; range 6-18).

> *The following is a list of subjects on which couples often have disagreements. How often, if at all, in the last month have you and [BABY'S FATHER/MOTHER] had disagreements about each of the following:*
>
> 1. *money*
> 2. *spending time together*
> 3. *sex*
> 4. *the pregnancy*
> 5. *drinking or drug use*
> 6. *being faithful*

Results of formal tests of the measure's validity have not been reported, however, several analyses of Fragile Families data have used this measure as an indicator of relationship quality. A study assessing relationship conflict and union formation used the 6 items about relationship conflict. The frequency of conflict was represented by the mean of parents' reports about whether they "never" (1), "sometimes" (2), or "often" (3) had conflict over the six items in the last month. Reports of conflict had inconsistent effects. Only father's reports of conflict significantly deterred cohabitation.[232] No chronbach's alpha was reported.

Another study found that couple conflict measured using maternal report of these items (chronbach's α =0.65) predicted poor maternal prenatal health behaviors.[233] A study among adolescents and young adults in the FF study used conflict items (α =0.64 mothers and 0.62 fathers) to predict father involvement. Disagreements reported by both mothers and fathers were not significantly associated with father involvement 3 years later.[231]

Partner Support

This measure was loosely adapted from the Winefield et al. Multi-Dimensional Support Scale (MDSS; 1992).[122,123] Five questions asked parents how often the mother or father of their baby displayed supportive or destructive behavior toward the respondent. Parents responded on a three point scale ranging from 1=often, 2=sometimes, 3=never about the items listed below. Support (positive) behaviors were reverse-scored when creating a total score, which summed the responses. Higher scores indicate more supportive and less destructive behaviors toward the respondent. Factor analysis using maximum likelihood indicated that the "s/he hits or slaps you when angry" item did not load above 0.32 (standard threshold)[234] on to the partner support factor. Therefore, this item was excluded and a four-item variable using the other items was created (α =0.60 mothers and 0.59 fathers; range 4-12).

Thinking about your relationship with [BABY'S FATHER/MOTHER], how often would you say that:

1. *s/he is fair and willing to compromise when you have a disagreement*
2. *s/he hits or slaps you when angry (*not include in summary variable)
3. *s/he expresses affection or love for you*
4. *s/he insults or criticizes you or your ideas*
5. *s/he encourages or helps you do things that are important to you*

Alpha coefficients are generally high for the MDSS (>.75) and the subscale scores correlate well with affect measures (e.g. depressive affect, self-esteem, psychological disturbance).[123]

Several analyses of Fragile Families data have used this measure, in different forms, as an indicator of relationship quality. A 9-item version was used 1 year postpartum among Fragile Families Fathers. These 9 items included the 5 items assessed at baseline. The author dichotomized the

outcome (sometime and often vs. never). Chronbach's α was 0.90 for married fathers and 0.93 for unmarried fathers. Relationship quality predicted perceptions of co-parental support for married fathers but not unmarried fathers.[235]

A 6-item version (which included the 5 items included in this analysis) was used 1 year postpartum among Fragile Families mothers and fathers. Authors averaged the scores for mothers and fathers (chronbach's α =0.76). Better relationship quality predicted greater parental engagement in infant and toddler years, with married and cohabiting couples similar in the association.[236]

A 4 item version ("insults or criticizes you or your ideas,""expresses affection or love for you," "is fair and willing to compromise," and "encourages and helps you to do things.") using baseline assessments from all mothers significantly predicted (chronbach's α =0.66) breastfeeding rates only among African Americans.[237]

Relationship Satisfaction

The items for this measure were developed specifically for the Fragile Families Study. The six items ask how life might be different if they were married to the baby's father/mother (for unmarried couples) or *not* married to the baby's father/mother for the married couples). Couples reported responses to the following items on a scale from 1=much better to 5=much worse. The responses for unmarried respondents were reverse scored with the theory that if they rated that the items would be worse with marriage, they were demonstrating a lack of satisfaction with their partner and/or relationship. Coding for responses for married respondents were maintained because if they rated that the items would be much worse if they were not married to the baby's father/mother, it shows they are more satisfied with their partner and/or relationship. A total relationship status satisfaction score was created by summing the responses. Higher scores indicate more satisfaction with their partner and/or relationship (α =0.72 mothers and 0.67 fathers; range 6-30).

If you were/were not married, how would life be different in terms of:

1. *financial security*
2. *overall happiness*
3. *freedom to do what you want*
4. *control over money*
5. *sex life*
6. *relations with parents*

No Fragile Families analyses to my knowledge have used these questions as a summary measure representing relationship quality. Therefore, this dissertation is a novel use of these questions as a representation of relationship quality.

Appendix III-1. Outcome and confounder descriptions and details

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
Birth Outcomes						
Birth Weight	Weight at birth in grams	--	--	At birth via labor log	--	Continuous
Gestational Age at Birth	Weeks pregnant at birth	--	--	At birth via labor log	--	Continuous
Mediator						
Depressive Symptoms	Center of Epidemiological Studies-Depression Scale (CES-D)[91] (adapted)	15 items assessed how often experienced the depressive feeling or thought (e.g. I felt depressed, had crying spells) - Five behavioral manifestations of depression items were removed	4-point scale ranging from 0 ("Rarely or none of the time (less than 1 day") to 3 ("Most of the time (5-7 days)")	Base (24-40 weeks pregnant)	Past Week	-Responses summed to form a continuous scale - Higher scores correspond to more depressive symptoms (range: 0-45) ($\alpha = 0.84$, $\alpha = 0.78$ m)
Confounders (Maternal and Paternal)						
Age	--	Summary variable created by from birth date.	--	Baseline	Current	Continuous

Household Income	--	Asks: " What is your household income (the total income before taxes earned by all members of your household) per year)	0 $0-$4,999 1 $5,000-$9,999 2 $10,000-$14,999 3 $15,000-$19,999 4 $20,000-$24,999 5 $25,000-$34,999 6 $35,000-$49,999 7 $50,000 or more	Baseline	Current	Categorical

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
School or Work Status	--	A summary measure created to indicate if the participant is either in school and/or working at least part-time.	1=Yes 0=No	Baseline	Current	Dichotomous
Race/Ethnicity	--	Variable constructed from two questions, the first asking their race (select all) and the second asking if they are Hispanic or Latino. Coded as black if selected black (regardless of ethnicity), Hispanic if selected Hispanic or Latino (regardless of race), white if they selected white only. All other participants were grouped into the "Other" category due to low sample size.	1= White 2= Black 3= Hispanic 4= Other	Baseline	Current	Categorical
Confounders (Maternal Only)						
Parity	--	Question in baseline interview	--	Baseline	Current	Continuous

Clinical Risk	--	Variable constructed from 5 yes/no items: Presence of gestational diabetes and preeclampsia as indicated on the labor log, having a prepregnancy BMI classified as obese based on height and weight questions from baseline interview, reporting no prenatal care by the time of the baseline interview and a positive urine test for chlamydia and/or Gonorrhea at the baseline interview.		Baseline and at birth via labor log	During Pregnancy	Continuous (range 0-5)

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
BMI pre-pregnancy	--	Calculated from participant report of pre-pregnancy weight and current height.	--	Baseline	Pre-Pregnancy	Continuous
Baby's Gender	--	--	1=Male 2=Female	At birth via labor log	--	Dichotomous

Appendix III-2. Variable details, items, validity and reliability

Stressful Life Events

This 11-item scale was adapted from the 12-item Life Events Scale, which was created by Brugha and Cragg (1990).[151] This scale asks participants if they have experienced stressful life events in the previous 6 months. Ten items out of the original 12-items were incorporated into the questionnaire, however, three original items were revised: "You became unemployed or you were seeking work unsuccessfully for more than one month" was changed to "In the past 6 months, did you become unemployed or were seeking work unsuccessfully," "You had a major financial crisis" was changed to simply "In the past 6 months, did you have money problems," and "You had problems with the police and a court appearance" was changed to "In the past 6 months, did you have problems with the police." Additionally, two questions were combined and changed into one question: "Your parent, child or spouse died" and "A close family friend or another relative (aunt, cousin, grandparent) died" were combined and shortened into "In the past 6 months, did a close family member or friend die."

Additionally two items were added for the research study including: "In the past 6 months, did you have problems at work or school," and "In the past 6 months have you moved." Two of the original items from the LEQ were also omitted from the research study including: "You had a separation due to marital difficulties" and "You were sacked from your job." The 11 items were summed to form a total score.

The test-retest reliability of the Life Events Scale is reported as .84 for a three-month period and .66 for a six-month period. Data on internal consistency are not available. Concurrent validity estimates were derived from the concordance between inpatient psychotic patients' identification of stressful events and those identified by a significant other; there was a 90% agreement when assessed at a threemonth period and a 70% agreement when assessed at six months. The authors also used an extensive interview of stressful events as a base rate and showed that the LEQ was sensitive to the identification of stressful events.[151]

Items:

In the past 6 months: have you suffered a serious illness, injury, or assault? did a close relative suffered a serious illness, injury, or assault?
did a close family member or friend die?
you break off a steady relationship?
did you have a serious problem with a close friend, neighbor, or relative?
did you become unemployed or were seeking work unsuccessfully? did you have money problems? did you have problems with the police? did you have problems at work or school? was something you valued was lost or stolen? have you moved?

General Discrimination

An adapted version of the Daily Life Experiences Scale was used to assess participant experiences of discrimination.[152] The original Daily Life Experiences Scale has 20-items, however the adapted version used 19 of those items. The items how often the survey taker has experienced discrimination (e.g. Being observed or followed in public places). The response scale ranged from 0 to 5:

0= “never,” 1= “less than once a year,” 2= “a few times a year,” 3= “about once a month,” 4= “a few times a month,” and 5 = “once a week or more.” Responses to items were summed to form a total score ranging from 0-95.

Four items from the original scale were also revised, including “Being mistaken for someone else of your same race (who may not look like you at all)” was changed to “mistaken for someone else (who may not look like you at all)” and “Being asked to speak for or represent your entire racial/ethnic group (e.g. What do ___people think?)” was changed to “asked to speak for or represent an entire group (e.g.
What do ___people think?), “Overhearing or being told an offensive joke or comment” was changed to “hear an offensive joke or comment” and “Being avoided, others moving away from you physically” was changed to “avoided, or do others move away from you physically.” There was also one item added: “Someone in the health system showed you hostility or a lack of respect, refused you service or paid less attention to you compared with others” and one item was omitted “Being considered fascinating or exotic by others.”

Items

In general, how often are you ignored, overlooked, or not given service (in a restaurant, store, etc.)?
In general, how often are you treated rudely or disrespectfully?
In general, how often are you accused of something or treated suspiciously?
In general, how often are you do others react to you as if they were afraid or intimidated?
In general, how often are you observed or followed while in public places?
In general, how often are you treated as if you were "stupid", being "talked down to"?
In general, how often are your ideas or opinions minimized, ignored, or devalued?
In general, how often do you hear an offensive joke or comment?
In general, how often are you insulted, called a name, or harassed?
In general, how often do others expect your work to be inferior?
In general, how often are you not taken seriously?
In general, how often are you left out of conversations or activities?
In general, how often are you treated in an "overly" friendly or superficial way?
In general, how often are you avoided, or do others move away from you physically?
In general, how often are you mistaken for someone who serves others (i.e., janitor, bed boy, maid)?
In general, how often are you stared at by strangers?
In general, how often are you laughed at, made fun of, or taunted?
In general, how often are mistaken for someone else (who may not look like you at all)?
In general, how often are you asked to speak for or represent an entire group (e.g., "What do _____ people think?")?
In general, how often has someone in the health system showed you hostility or a lack of respect, refused you service or paid less attention to you compared with others?

Perceived Stress

This 10-item Perceived Stress Scale (PSS) assessed the degree to which individuals perceive situations in their lives to be stressful.[87] The items focused on how unpredictable, uncontrollable, and overloaded individuals perceive their lives to be. The participant was asked to rate the perceived level of stress in their life during the past month (e.g., “How often have you felt: upset by something that

happened unexpectedly, able to control irritations in your way, and on top of things"). Possible responses ranged from 0 to 4, with 0 = "never," 1 = "almost never," 2 = "sometimes," 3 = "fairly often," to 4 = "very often." Positive items were reverse-scored. Items were summed to form a total score ranging from 0 to 40, with higher scores corresponding to greater perceived stress.

Early studies found that the 14-item measure has good psychometric properties. For example, Cohen and colleagues (1983) reported coefficient alpha reliabilities of .84, .85, and .86 across two samples of college students and a community smoking cessation group.

Early studies also found that the PSS was moderately related to responses on other measures of appraised stress, as well as to measures of potential sources of stress as assessed by event frequency. Studies also found that the PSS provided better predictions for individual behavior than did life-event scales of psychological symptoms, physical symptoms, and utilization of health services. Because levels of perceived stress should be influenced by daily hassles, the predictive validity of the PSS is expected to fall off rapidly after four to eight weeks.[87]

Items

In the past month, how often have you felt…

Upset by something that happened unexpectedly?
Unable to control important things in your life?
Nervous and stressed?
Confident in your ability to handle your personal problems? r
That things were going your way?r
Unable to cope with all of the things you had to do?
Able to control irritations in your life? r
On top of things? r
Angry because of things that happened that you couldn't control?
That difficulties were piling up so high that you couldn't overcome them

r=reverse coded

Depressive Symptoms

Fifteen items were adapted from the 20-item Center for Epidemiologic Studies Depression Scale (CES-D), which was developed by Radloff (1977).[91] The items address whether the participant felt or exhibited the behavior of the major components of depression in the previous week (e.g. I felt that everything I did was an effort). As the original CES-D scale specified, participants were asked to respond using: 0= "rarely or none of the time (less than 1 day)," 1= "some or a little of the time (1-2 days)," 2 = "Occasionally or a moderate amount of the time (3-4 days)," and "Most or all of the time (5-7 days)." The five behavioral manifestations of depression items were removed, including item did not feel like eating, trouble keeping mind on what I was doing, everything I did was an effort, my sleep was restless, and could not get going.

The CES-D scale discriminates strongly between patient and general population groups, be sensitive to levels of severity of depressive symptomatology, and reflect improvements after psychiatric

treatment. In addition, it should correlate well with other scales designed to measure depression, and be related to a felt need for psychiatric services.[91]

The CES-D scale has been found to have high internal consistency (coefficient alpha =.85 in the general population and .90 in the patient sample); studies found that both inter-item and item-scale correlation were higher in the patient sample than in the population samples. The scale also has moderate test-retest reliability (r between .45 and .70). Test-retest correlation was higher for shorter time intervals.[91]

Items

During the past week…

I was bothered by things that usually don't bother me.
I felt I could not shake off the blues even with help from my family or friends.
I felt that I was just as good as other people.r I
felt depressed.
I felt hopeful about the future. r I
thought my life had been a failure.
I felt fearful.
I was happy. r
I talked less than usual.
I felt lonely.
People were unfriendly.
I enjoyed life. r I
had crying spells.
I felt sad.
I felt that people disliked me.

r=reverse coded

Appendix III-3. Multi-level linear regression models with natural log transformed outcomes

Multi-level linear regression models examining relationship between stressors (own and partner's) and natural log transformed behavioral risk and depressive symptoms. All models control for age, education, income, race/ethnicity, parity and employment status**.**

	Smoking			**Drinking**			**Marijuana Use**			**Hard Drug Use**[a]			**Conduct Problems**			**Depressive Symptoms**		
	B	SE	t	B	SE	t	B	SE	t	B	SE	t	B	SE	t	B	SE	t
Personal Hardship Stressors																		
Actor	**.25***	**.11**	**2.28**	**.14**‡	**.07**	**1.89**	.07	.07	.92	.01	.09	.09	**-.02*****	**.01**	**-4.10**	**.45***	**.22**	**2.01**
Partner	-.16	.10	-1.56	**-.12**‡	**.06**	**-1.92**	-.02	.07	-.26	-.05	.10	-.51	-.00	.01	-.64	.34	.23	1.52
Close Relationship Stressors																		
Actor	-.01	.15	-.09	.09	.10	.89	.15	.10	1.5	**.46****	**.13**	**3.43**	-.01	.01	-1.57	.49	.33	1.49
Partner	-.04	.15	-.44	-.01	.10	-.07	.08	.10	.76	-.12	.13	-.90	-.01	.01	-1.59	.50	.33	1.54
Neighborhood Problems																		
Actor	**.05****	**.02**	**2.92**	.01	.01	.80	.02	.01	1.84‡‡	-.01	.01	-.50	-.00	.00	-.93	**.07***	**.04**	**1.98**
Partner	-.00	.02	-.07	-.02	.01	-1.41	.00	.01	.21	-.01	.02	-.76	.00	.00	.35	-.04	.04	-1.06
General Discrimination																		
Actor	.12	.16	.73	.17	.11	1.44	**.23***	**.12**	**2.0**	**.29***	**.12**	**2.47**	**-.05*****	**.01**	**-6.77**	**1.39*****	**.33**	**4.21**
Partner	.14	.15	.93	.00	.09	.03	-.13	.10	-1.40	.13	.16	.81	-.00	.02	-.52	-.16	.35	-.47

* P<.05 ** P≤ 0.01 *** P≤ 0.001 ‡ P=.06 ‡ P=.06 ‡‡ P=.07

[a]Only reported for men

Appendix IV-1. Outcome and Confounder descriptions and details

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
Outcomes						
Smoking	Recreational Drug Use Scale[153]	Frequency of smoking	5-pt scale ranging from 0 "Never" to 4 "Every Day."	Baseline	Past 3 months	--
Drinking	Recreational Drug Use Scale[153]	Frequency of drinking alcohol	5-pt scale ranging from 0 "Never" to 4 "Every Day."	Baseline	Past 3 months	--
Marijuana Use	Recreational Drug Use Scale[153]	Frequency of smoking marijuana	5-pt scale ranging from 0 "Never" to 4 "Every Day."	Baseline	Past 3 months	--
Hard Drug Use	Recreational Drug Use Scale[153]	Frequency of use of crack, heroin, methamphetamines, and "other hard drugs"	5-pt scale ranging from 0 "Never" to 4 "Every Day."	Baseline	Past 3 months	Items were summed to form a total *hard drug use* score (range: 0 to 16)
Conduct Problems	DSM Conduct Problems Scale[209]	Assessed whether participant engaged in conduct problems such as got in a fight or skipped school or work.	4-point scale ranging from 1= "5 or more times" to 4= "Not at all."	Baseline	Past 6 months	7 items were summed to form a total score with higher scores indicating fewer problems (range: 7-28)

Depressive Symptoms	Center of Epidemiological Studies-Depression Scale (CES-D) [51] (adapted)	15 items assessed how often experienced the depressive feeling or thought (e.g. I felt depressed, had crying spells) - Five behavioral manifestations of depression items were removed	4-point scale ranging from 0 ("Rarely or none of the time (less than 1 day") to 3 ("Most of the time (5-7 days)")	Base (24-40 weeks pregnant)*	Past Week	-Responses summed to form a continuous scale - Higher scores correspond to more depressive symptoms (range: 0-45) ($\alpha = 0.84$, $\alpha = 0.78$ m)

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
Confounders (Maternal and Paternal)						
Age	--	Summary variable created by from birth date.	--	Baseline	Current	Continuous
Personal Income	--	Asked: " What is your personal income (the total income before taxes earned by you only per year)	0 $0-$4,999 1 $5,000-$9,999 2 $10,000-$14,999 3 $15,000-$19,999 4 $20,000-$24,999 5 $25,000-$34,999 6 $35,000-$49,999 7 $50,000 or more	Baseline	Current	Categorical
Employed	--	Asked: "Are you currently employed?"	1 Not working 2 Working Part-time 3 Working Full-time	Baseline	Current	Categorical
In School	--	A summary measure created to indicate if the participant is either in school and/or working at least part-time.	1 Yes 0 No	Baseline	Current	Dichotomous

Years School	--	Greatest number of years of education completed	Values of 1-12 indicate years of primary or secondary school education completed. If marked "Some college", they were given a value of 14. If marked that they "Graduated college" they were give a value of 16. If marked "Some graduate or professional school"	Baseline	Current	1-20
Construct	**Measure**	**Description**	**Response Scale**	**Time Points Assessed**	**Time Frame Referenced**	**Summary Measure**
			they were give a value of 18. If marked "Completed graduate or professional school" they were given a value of 20.			
Race/Ethnicity	--	Variable constructed from two questions, the first asking their race (select all) and the second asking if they are Hispanic or Latino. Coded as black if selected black (regardless of ethnicity), Hispanic if selected Hispanic or Latino (regardless of race), white if they selected white only. All other participants were grouped into the "Other" category due to low sample size.	1= White 2= Black 3= Hispanic 4= Other	Baseline	Current	Categorical

Confounders (Maternal Only)						
Parity (First Child)	--	Assessed # of biological children the respondent had	--	Baseline	Current	A dichotomous variable was created indicating whether the index child was their first child or not 0=No 1=Yes

Appendix IV-2. Variable details, items, validity and reliability

Stressful Life Events

This 11-item scale was adopted from the 12-item Life Events Scale, which was created by Brugha and Cragg (1990).[49] This scale asks participants if they have had stressful life events. 10-items out of the original 12-items were incorporated into the questionnaire, however, three original items were revised: "You became unemployed or you were seeking work unsuccessfully for more than one month" was changed to "In the past 6 months, did you become unemployed or were seeking work unsuccessfully," "You had a major financial crisis" was changed to simply "In the past 6 months, did you have money problems," and "You had problems with the police and a court appearance" was changed to "In the past 6 months, did you have problems with the police." Additionally, two questions were combined and changed into one question: "Your parent, child or spouse died" and "A close family friend or another relative (aunt, cousin, grandparent) died" were combined and shortened into "In the past 6 months, did a close family member or friend die."

Additionally 2-items were added for the research study including: "In the past 6 months, did you have problems at work or school," and "In the past 6 months have you moved." Two of the original items from the LEQ were also omitted from the research study including: "You had a separation due to marital difficulties" and "You were sacked from your job."

The test-retest reliability of the Life Events Scale is reported as .84 for a three-month period and .66 for a six-month period. Data on internal consistency are not available. Concurrent validity estimates were derived from the concordance between inpatient psychotic patients' identification of stressful events and those identified by a significant other; there was a 90% agreement when assessed at a threemonth period and a 70% agreement when assessed at six months. The authors also used an extensive interview of stressful events as a base rate and showed that the LEQ was sensitive to the identification of stressful events.[49]

Two subscales were created for use in this study: **personal hardship stressors** and **close relationship stressors**. The items in each subscale are listed below.

Items:

In the past 6 months:

Personal hardship stressors

have you suffered a serious illness, injury, or assault? did you become unemployed or were seeking work unsuccessfully? did you have money problems? did you have problems with the police? did you have problems at work or school? was something you valued was lost or stolen?
have you moved?

Close relationship stressors did a close relative suffered a serious illness, injury, or assault? did a close family member or friend die? you break off a steady relationship? did you have a serious problem with a close friend, neighbor, or relative?

General Discrimination

An adapted version of the Daily Life Experiences Scale was used to assess participant experiences of discrimination.[50] The original Daily Life Experiences Scale has 20-items, however the adapted version used 19 of those items. The items how often the survey taker has experienced discrimination (e.g. Being

observed or followed in public places). The response scale ranged from 0 to 5: 0= “never,” 1= “less than once a year,” 2= “a few times a year,” 3= “about once a month,” 4= “a few times a month,” and 5 = “once a week or more.” Responses to items were summed to form a total score ranging from 0-95.

Four items from the original scale were also revised, including “Being mistaken for someone else of your same race (who may not look like you at all)” was changed to “mistaken for someone else (who may not look like you at all)” and “Being asked to speak for or represent your entire racial/ethnic group (e.g. What do ___people think?)” was changed to “asked to speak for or represent an entire group (e.g. What do ___people think?), “Overhearing or being told an offensive joke or comment” was changed to “hear an offensive joke or comment” and “Being avoided, others moving away from you physically” was changed to “avoided, or do others move away from you physically.” There was also one item added: “Someone in the health system showed you hostility or a lack of respect, refused you service or paid less attention to you compared with others” and one item was omitted “Being considered fascinating or exotic by others.”

Items

In general, how often are you ignored, overlooked, or not given service (in a restaurant, store, etc.)?
In general, how often are you treated rudely or disrespectfully?
In general, how often are you accused of something or treated suspiciously?
In general, how often are you do others react to you as if they were afraid or intimidated?
In general, how often are you observed or followed while in public places?
In general, how often are you treated as if you were "stupid", being "talked down to"?
In general, how often are your ideas or opinions minimized, ignored, or devalued?
In general, how often do you hear an offensive joke or comment?
In general, how often are you insulted, called a name, or harassed?
In general, how often do others expect your work to be inferior?
In general, how often are you not taken seriously?
In general, how often are you left out of conversations or activities?
In general, how often are you treated in an "overly" friendly or superficial way?
In general, how often are you avoided, or do others move away from you physically?
In general, how often are you mistaken for someone who serves others (i.e., janitor, bed boy, maid)?
In general, how often are you stared at by strangers?
In general, how often are you laughed at, made fun of, or taunted?
In general, how often are mistaken for someone else (who may not look like you at all)?
In general, how often are you asked to speak for or represent an entire group (e.g., "What do _____ people think?")?
In general, how often has someone in the health system showed you hostility or a lack of respect, refused you service or paid less attention to you compared with others?

Neighborhood Problems

This 15-item scale was adapted from the 13-item Perceived Neighborhood Problems Scale[207] in order to assess the participant's perception of their neighborhood’s quality. Two items were added to the original scale: “Feeling unsafe after dark” and “drugs.” Participants are asked to respond using the scale: 1 = "Not a problem," 2 = "Minor Problem," and 3 = "Serious Problem."

The 15 items were summed to form a total score.

Items

In your neighborhood, how much of a problem is….

Vandalism
Litter and rubbish
Assault and muggings
Disturbance by children or youngsters Speeding traffic
Nuisance from dogs
Reputation of neighborhood
Smells and fumes
Burglaries
Discarded needles and syringes
Uneven or dangerous pavements
Lack of safe places for children to play
Lack of recreational facilities
Feeling unsafe after dark
Drugs

Conduct Problems

Conduct problems were assessed by means of an adapted, 7-item version of the DSM Conduct Problems Scale.[209] Participants indicated how often they had various conduct problems in the previous 6 months on a 4-point scale ranging from 1= "5 or more times" to 4= "Not at all." The original DSM Conduct Problems Scale included 17 items and was based on the criteria for a DSM-III-R conduct disorder. The internal consistency of the items in the original scale among a sample of gay/bisexual youth was 0.74.[209] The 7 items were summed to form a total score.

Items

Please mark how often you have done the following in the last 6 months.

Skipped school or work?
Yelled at a friend or family member?
Got into an argument with others?
Got in a fight?
Said things that weren't true?
Stole something?
Been in trouble at school or work?

Depressive Symptoms

Fifteen items were adapted from the 20-item Center for Epidemiologic Studies Depression Scale (CES-D), which was developed by Radloff (1977).[51] The items address whether the participant felt or exhibited the behavior of the major components of depression in the previous week (e.g. I felt that everything I did was an effort). As the original CES-D scale specified, participants were asked to respond using: 0= "rarely or none of the time (less than 1 day)," 1= "some or a little of the time (1-2 days)," 2 = "Occasionally or a moderate amount of the time (3-4 days)," and "Most or all of the time (5-7 days)." The five behavioral manifestations of depression items were removed, including item did not feel like eating, trouble keeping mind on what I was doing, everything I did was an effort, my sleep was restless, and could not get going.

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Items

During the past week…

I was bothered by things that usually don't bother me.
I felt I could not shake off the blues even with help from my family or friends.
I felt that I was just as good as other people.r I felt depressed.
I felt hopeful about the future. r I
thought my life had been a failure.
I felt fearful.
I was happy. r
I talked less than usual.
I felt lonely.
People were unfriendly.
I enjoyed life. r I
had crying spells.
I felt sad.
I felt that people disliked me.

r=reverse coded

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Chapter II. Parental Reports of Relationship Quality and the Association with Birth Outcomes among Infants in the Fragile Families Study

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a. Introduction

Preterm birth (PTB; <37 weeks gestation) and low birth weight (LBW; <2,500 grams) are among the leading causes of infant mortality in the United States (U.S.).[1] Furthermore, infants born preterm and/or with a low birth weight are at increased risk for behavioral and emotional problems during childhood, and chronic health conditions into adulthood, such as asthma, coronary artery disease and type II diabetes.[2,3] In the U.S., 11.~~3~~84% of infants are born preterm and 8.0~~2~~% are born with a low birth weight.[4] Beyond the implications for the child's health and development, the costs to the U.S. healthcare system associated with these birth outcomes are staggering. Medical care costs due to PTB alone exceeded $16.8 billion in the U.S. in 2005, a figure that does not include long-term productivity and educational costs to individuals and society as a whole.[5]

Every Healthy People initiative since the program's inception in the 1970s has included the goal of reducing the rates of LBW by improving the population rates of traditional risk factors, such as smoking during pregnancy and access to and use of prenatal care.[6–9] Over the last few decades there have been substantial improvements in the population rates of these traditional risk factors; however, the rates of PTB and LBW continue to remain high. For example, between 1990 and 2002, the rates of preterm birth and LBW in the U.S. each increased by about 15%,[10] while the rates of maternal smoking during pregnancy declined 38% during the same time period.[11] This evidence suggests that there are other factors, beyond traditional risk factors, that contribute to the risk for PTB and LBW.

Researchers have identified several psychosocial factors that have been linked to the risk for preterm birth and low birth weight, including level of social support.[12–14] Lack of social support during pregnancy has been related to stress and anxiety[12,15] and evidence shows that maternal stress during pregnancy is consistently predictive of negative birth outcomes, including PTB[13,16–19] and LBW.[16,17,20,21] For example, Feldman et al. (2000) demonstrated among a sample of 247 low obstetric risk women of mostly European or Hispanic ethnicity, that higher social support during pregnancy assessed at 28-30

weeks gestation, predicted higher infant birth weight adjusted for gestational age, marital status, education, ethnicity and obstetrical risk (adjusted B=0.15; P <0.05).[14]

Romantic relationships are a substantial source of social support as well as stress,[22] and have been shown to influence many health outcomes, including cardiovascular disease,[23] inflammation[24] and impaired immune function.[24] ~~During pregnancy, an expectant woman's relationship with the baby's father is most often an important social relationship.~~ While an increasing number of mothers are not married when their child is born, over 80% of unmarried women are in a relationship with the baby's father during pregnancy.[25] Thus, a woman's male partner—married or not—is usually an important social relationship during pregnancy and he likely has a substantial influence on the social wellbeing? Of an expectant mother during this time.

~~For example, r~~Research has shown that paternal support and involvement during pregnancy reduces the risk of negative birth outcomes.[26–29] Increased father support and involvement may influence birth outcomes by reducing maternal stress[16,30] and affecting pregnant women's health behaviors (e.g. smoking, attending prenatal care).[27,31,32] ~~Alio et al. reviewed~~A recent review of seven ~~published~~ studies ~~and~~ found that measures of paternal involvement ~~(measured in various ways across studies)~~ were~~as~~ consistently related to lower odds of LBW, the infant being small for gestational age (SGA) and more positive maternal prenatal health behaviors.[27] These studies ~~have~~ measured paternal support and involvement in ~~many~~ different ways, generally using crude proxies for involvement such as ~~;~~ ~~however, the measures were usually crude (e.g.~~ inclusion of father's name on birth certificate (add refs.) and whether the ~~-~~father contributes financially (add refs).

Paternal support is only part of how relationships can affect birth outcomes. Other dimensions of parental relationship quality, such as conflict, have the capacity to influence birth outcomes through their effects on maternal stress. ~~Cohen (2004)[22] describes how C~~conflict may cause psychological distress leading to negative health behaviors and/or physiological changes that increase disease risk,

Commented [HJ1]: Need the units to be able to interpret – would be better with 95% CIs

Commented [HJ2]: Which ones did they study?

while social support may buffer the effects of stress (Cohen, 2004). Little research, however, has explored if and how different dimensions of parental relationship quality during pregnancy affect birth outcomes. As described above, studies have focused on relationship characteristics that are easier to measure, such as marital status and whether the father's name was on the birth certificate. We know little about ~~*what* about~~the mechanism by which being married or having the baby's father's name on the birth certificate (beyond their associations with socioeconomic status) leads to better birth outcomes. Relationship quality is a multidimensional construct that includes dimensions such as support and conflict.[33,34] Sources of relationship support may include a partner's encouragement and willingness to compromise, while conflict may include disagreements about finances, spending time together and sexual relations. These dimensions may have unique associations with birth outcomes.

Furthermore, measures of relationship characteristics and paternal support are almost always reported in research studies solely by the mother. This approach is problematic for several reasons. First, asking mothers to report their partner's contributions or feelings may introduce~~s a level of~~ measurement error ~~that we are unable to determine~~as these are secondhand reports. Second, it ignores the possibility that fathers can have a unique and important effect on birth outcomes themselves, through their effects on maternal health and behaviors. Third, we are unable to assess whether there is an interactive effect of maternal and paternal reports of relationship quality on birth outcomes—for example, is having both parents report high levels of support from their partner much better than when only the mother reports high levels of support from her partner?

Commented [HJ3]: I don't understand this second point

In addition, we cannot assume that each facet of relationship quality affects birth outcomes the same way among couples in different types of relationships. Qualitative research has described how married couples perceive stress in relationships differently than unmarried couples. In one study by Waller,[35] when discussing tensions in their relationships, married couples perceived that conflicts were surmountable, while unmarried couples felt like the conflicts were risks to the stability of their

relationship.[35] Couple disagreements or conflict may lead to more stress among unmarried couples than among married couples, and thus the same conflicts may have a different effect on birth outcomes based on the couple's marital status.

Commented [HJ4]: Nice, solid introduction

The Current Study

This study uses data from both maternal and paternal reports among married and unmarried couples in the Fragile Families and Child Well-Being study to, first, explore whether multiple dimensions of parental relationship quality during pregnancy are associated with their baby's birth weight and gestational age at birth. I hypothesize that both maternal and paternal reports of fewer couple activities, more conflict, less partner support and less relationship satisfaction will be associated with lower birth weight and earlier gestational age at birth.

Second, this study aims to look at the interactive effect of maternal and paternal reports of relationship quality on these birth outcomes. I hypothesize that high levels of partner support, relationship satisfaction and couple activities when reported by both parents will have a greater positive effect on birth weight and gestational age than when the mother only reports high levels of these dimensions. I also hypothesize that high levels of couple conflict when reported by both parents will have a more negative effect on birth weight and gestational age than when the mother only reports high levels of couple conflict.

Commented [HJ5]: Another interesting possibility is that it is when there is disagreement between the two about the quality of the relationship, regardless of the direction that is harmful…

Third, this study aims to assess whether the association of parental relationship quality with birth outcomes differs among married and unmarried couples. I hypothesize that both maternal and paternal reports of couple activities, couple conflict, partner support and relationship satisfaction will have a greater effect on birth weight among unmarried couples than among married couples.

b. Methods

b.1 Data Source

Overview and Sampling

Data for the analyses come from the Fragile Families and Child Well-Being Study (hereon referred to as Fragile Families). IRB approval to use the de-identified Fragile Families survey and medical record data was obtained from the CUNY Graduate Center Human Research Protections Program. The Fragile Families and Child Well-Being Study is an ongoing longitudinal study following a national sample of new parents and their children born between the years 1998 and 2000. The study used a stratified random sample of cities with 200,000 or more people, with hospitals sampled within the cities and births sampled within the hospitals. The cities were stratified according to a scoring system that ~~took into~~ accounted for variability in the policy environments and labor market conditions within the cities. In several cities, births were sampled from all hospitals; in a few cities, hospitals were excluded for cost and efficiency reasons if the hospital had few births. In New York and Chicago, hospitals with over 1,000 non-marital births per year were randomly selected. Random samples of births were taken within each sampled hospital based on quotas that matched the percent of non-marital births in that city. Please see Reichman et al. (2001) for further details on the sampling strategy.[36]

Commented [HJ6]: Add a reference

~~*Subjects*~~*Participants*

Mothers were eligible if they were 18 years or older (in one-third of the hospitals, though, this restriction did not apply and some women under 18 were interviewed), spoke English or Spanish, were not too ill to participate, reported that the father of their new baby was living, were not planning adoption for the baby and the baby did not die before the interview could take place.

The analyses for this aim were based on the national sample of women having a singleton birth and the fathers of the index baby. Couples were included in the analysis if they were in a relationship

(reported that they were married, cohabiting or visiting), both the father and mother completed the survey and ~~either or both~~at least one outcome birth weight and/or gestational age data was available from the medical record abstraction (N=2622 for birth weight and 2637 for gestational age). Please see Figure II-1 below for the Data Selection Flow Chart. The data are representative of singleton births occurring in large (>200,000 people) U.S. cities.[36]

Commented [HJ7]: Nice figure – just make it clear how many of the ones with birthweight did not have gestational age (had birthweight only) and the same for EGA.

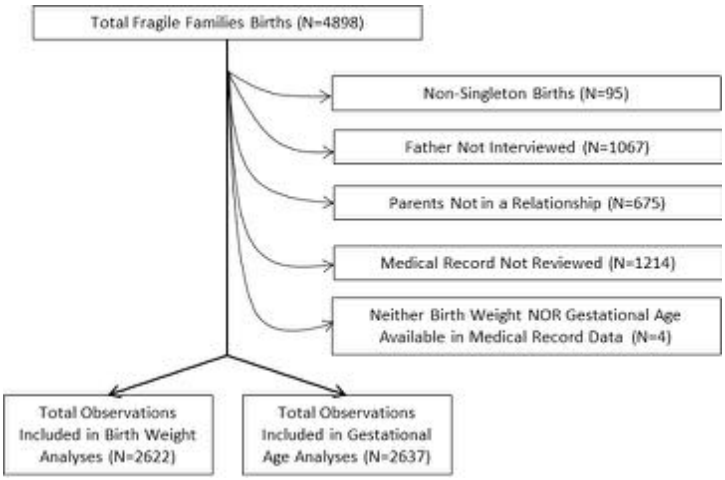

Figure II-1. Data Selection Flow Chart

Procedures

Parents completed baseline interviews in 75 hospitals or by phone in 20 cities across the U.S.generally within a few days ~~after their children were born~~of their child's birth. Mothers and 7~~5~~% of fathers were interviewed within 7 days ~~shortly after~~ of the birth of their baby during the baseline wave of the study between the years of 1998 and 2000. Nearly all (xx%) mothers were interviewed in the hospital, while ~~. F~~Fathers were interviewed in the hospital (76.2%) or by phone (23.8%).[37] Mothers were interviewed between 0 and 112 days after the birth, with 99% of the interviews taking place within seven days of the birth. Fathers were interviewed between 0 and 381 days ~~after~~ of the birth, with 77%

of the interviews taking place within seven days of the birth.[38] Parents were asked by trained interviewers about their health, relationships, employment, finances, and environmental factors.[36]

~~Medical records data~~Birth outcome data were abstracted by trained research staff from birth hospitalization records for mothers and the focal children. These data were available for 3,684 births. Data for the remaining 1214? births was not available because either 1) the hospital did not grant access to this data or there were too few cases to make it financially feasible (n=xx, 38%), 2) the mother refused consent (n=xx, 33%) or 3) the records could not be located in the hospital (n=xx, 29%). All procedures were approved by the Columbia University and the Princeton University Institutional Review Boards (IRBs), and by IRBs at the participating study hospitals.

b.2 Measures

Please see Appendix II-1 and Appendix II-2 for detailed item descriptions, and estimates on the validity and reliability of the measures used in the analyses for this chapter.

Predictors

All exposure variables were measured at the baseline survey, which occurred, in most cases, within a few days after the baby's birth. Four parent-reported summary measures of relationship quality were included in this analysis: 1) *positive couple activities, 2) couple conflict*, 3) *partner support* and 4) *relationship satisfaction*. Table II-1 shows a detailed description of the relationship quality predictor variables. Reports of positive couple activities and conflict referred to experiences over the previous month. Reports of partner support and relationship satisfaction referenced the current moment in time.

Additionally, two other indicators of relationship quality were included. *The baby's father's presence at the birth* was assessed by asking the baby's father whether he was present at the birth (Yes/No). *Relationship duration* was also assessed by asking women how many years and/or months they knew the baby's father before the pregnancy.

Commented [HJ8]: Before the pregnancy began or before the birth?

Table II-1. Relationship Quality Predictor Variables

Relationship Quality Predictor	Measure	Description	Response Scale	Scoring
Positive Couple Activities	Original to Fragile Families	4 items asked whether they had done positive activities with baby's father/mother in the **last month** (e.g. went out to a movie, helped each other solve a problem)	1=Yes 0=No	-Responses summed to form an index -Higher scores correspond to more positive activities (range: 0-4) (α=0.64 w, 0.60 m)
Couple Conflict	Adapted from National Survey of Family Health[39]	6 items assessed frequency of disagreements about specific topics in the **last month** (e.g. money, sex, being faithful)	1= never 2= sometimes 3= often	-Responses summed to form a continuous scale -Higher scores correspond to more disagreement/more conflict (range: 6-18) (α=0.65 w, 0.64 m)
Partner Support	Adapted from Multidimensional Support Scale (MDSS)[40,41] and Susan Loyd's Effects of Violence on Work and Family project.	4 items assessed frequency of supportive and destructive behavior toward respondent by the baby's father/mother (e.g., s/he is fair and willing to compromise, s/he insults or criticizes you or your ideas)	1= often 2= sometimes 3= never	-Responses summed to form a continuous scale -Supportive behaviors were reverse scored. -Higher scores correspond to more partner support (range: 4-12) (α=0.60w, 0.59 m)
Relationship Satisfaction	Original to Fragile Families	6 items ask how life might be different if they were married to the baby's father/mother (for unmarried) or not married to the baby's father/mother (for married) (e.g. financial security, happiness)	4-point scale ranging from 5=much worse to 1=much better	-Responses summed to form a continuous scale -Responses from unmarried respondents were reverse scored. -Higher scores correspond to more partner/relationship satisfaction (range: 6-30) (α=0.72 w,0 .67m)
Baby's Father present at birth	--	Asked baby's father whether he was present at the birth	1=Yes 0=No	Dichotomous
Relationship Duration	--	Asked mothers years and/or months they knew the baby's father before the pregnancy	Months	Continuous (range: 0-432)

Commented [HJ9]: Note that this requires having money – were there other options for things they could have done together?

Commented [HJ10]: I didn't understand this at first – need to explain that w is for women and m is for men and that this Is the Cronbach's alpha. I think there is a different statistic to use when summing dichotomous outcomes in a scale (KR). Make it clear in the table title that you are including scale reliability estimates from THIS data.

Outcomes

The baby's *gestational age at delivery* and *birth weight* were ascertained from the mother's medical record at the birth hospitalization. Gestational age was recorded in weeks and birth weight was recorded in grams.

Covariates

Several confounders were accounted for during model building and are described in detail in Appendix IV1. Demographic confounders included both maternal and paternal age, household income, education and race/ethnicity, and maternal parity, marital status and whether she paid with Medicaid or was otherwise uninsured at the time of delivery.

Commented [HJ11]: If cohabirting?

Other maternal clinical/health confounders included a history of mental health problems before pregnancy, prenatal care, gestational diabetes, pre-eclampsia or eclampsia, obesity during pregnancy, HIV/STI positive during pregnancy and child gender. These measures were abstracted from the mother's medical record.

Maternal use of drugs, alcohol and cigarettes during pregnancy (all yes/no) were also accounted for. These measures were abstracted from the mother's medical record.

Effect Measure Modifier

Marital status (yes/no) was treated as an effect measure modifier with the hypothesis that relationship quality would have a different effect on birth outcomes among married and unmarried couples.

Clustering and Weighting Variables

Due to the sampling procedures described above, descriptive statistics were run using city weights, making the estimates representative of births in the mother's city in the year of the interview.[42] Reliability estimates, correlations and t-tests were not run using any weighting or cluster variables. All regression analyses accounted for city and hospital variables by including these terms in the cluster statement within the SAS procsurvey command. Because mothers' and fathers' responses were included within the same model, a variable identifying the couple (ffchid) was also included in the cluster statement. Because unmarried births were oversampled, all analytical models controlled for marital status (coded 0/1) within the regression equation.

Commented [HJ12]: Not sure I understand this statement - seems like the weight will take care of this – did you include the weights in the regression analyses?

b.3 Statistical Methods

Descriptive Statistics

Descriptive statistics were produced using SAS 9.3 proc freq and proc means commands with city weights applied?. All remaining analyses used SAS 9.3 procsurvey commands and accounted for clustering by couple, and marital status, city and hospital due to the sampling scheme. Procsurvey commands create robust standard errors and therefore the estimates are robust against non-normality.

Correlations of all predictor variables and covariates with each birth outcome were run separately for mothers and fathers using the proc corr SAS command with city weights.

Reliability estimates were calculated for the relationship quality predictor variables separately among mothers and fathers, and were sufficient for research purposes (Table II-2).

Table II-2. Reliability estimates for relationship quality predictor variables among women and men.

	Chronbach's Alpha (unstandardized)	
	Women	**Men**
Positive Couple Activities	0.64	0.60
Couple Disagreements	0.65	0.64
Partner Support Behaviors	0.60	0.59
Relationship Satisfaction	0.72	0.67

Commented [HJ13]: Not sure you need this here and in table 1 – also note that should use a different statistic when the measures are dichotomous - KR

The amount of correlation between the mother's and father's report of the relationship quality predictor variables was also assessed (Table II-3). With the exception of relationship satisfaction, there was a moderate amount of correlation between the predictor variable responses (except a low amount of correlation between reports of relationship satisfaction)[43] among mothers and fathers within couples. Correlation coefficient values corrected for attenuation (by the variable reliability estimates) were also calculated in order to evaluate how highly correlated the scales would be if they were measured without

Commented [HJ14]: You may want to run this on a subsample when you restrict to couples who reported within 30 days of one another or some such number (so that the cases where the woman responded at one point in time and the man a year later, etc.) are not included in this – the relationship may have changed in the interim.

error (Table II-3, columns 3, 5 and 7). These values were calculated for the entire population of interest, while controlling for marital status (columns 2,3), and also for married (columns 4,5) and unmarried couples (columns 6,7) while not controlling for marital status.

The fact that the corrected coefficients in all cases were higher demonstrates that the correlation of mother and father reports could be even greater if the reliability of the variables were greater. Only positive couple activities reached a fairly high level of correlation (.72) indicating that about half of the variation in scores is shared within couples. Nevertheless, some of the variance in scores is not shared, allowing the assessment of the contribution of each partner's reports of the relationship quality predictor variables. Therefore, all regression models that include both mother's and father's reports account for clustering by couple by including the couple identifier within the cluster statement of the SAS procsurvey command.

Table II-3. Correlations and Correlations Corrected for Attenuation between maternal and paternal reports of relationship quality.

	Total Subpopulation		**Married within Subpop**		**Unmarried within Subpop**	
	R	**Corrected R**	**R**	**Corrected R**	**R**	**Corrected R**
Positive Couple Activities	0.43	0.70	0.40	0.64	0.43	0.69
Couple Disagreements	0.35	0.54	0.43	0.67	0.31	0.48
Partner Support Behaviors	0.26	0.44	0.27	0.46	0.25	0.42
Relationship Satisfaction	0.26	0.37	0.14	0.20	0.10	0.15

Regression Model Building

Initially, generalized estimating equations (GEE) were employed to account for the correlated nature of the couple reports and, therefore, clustering by couple. Generalized estimating equations can help tease out the independent effect of each parent on the birth outcomes. GEE produces population average estimates of an effect of the predictor on the outcomes and accounts for clustering of data within couples.[44] GEE analyses, however, are not particularly amenable to handling multiple clustering variables. Due to the sampling structure, the analyses needed to account for multiple levels of clustering, including couple, city, hospital and marital status. Therefore, the analyses were also conducted using linear regression, while accounting for all of the clustering variables. As expected, the effect estimates were the same when employing linear regression and GEE. The confidence limits for estimates created using GEE were only slightly tighter than those of the linear regression estimates and the results were substantively the same. Therefore, I present the results from the linear regression models that account for all clustering variables, which are in effect, more conservative than the GEE models.

Commented [HJ15]: I am confused – GEE can be a form of a linear regression that accounts for clustering – do you mean that you also ran a random effects model for linear regression in addition to a GEE model for linear regression?

To start model building, bivariate associations were produced between each exposure variable (mother and father reports included simultaneously) and each birth outcome separately (birth weight and gestational age) while controlling for couple, city, hospital and marital status

Next, multivariate linear regression models were produced between all exposure variables and each birth outcome separately, including both mothers' and fathers' reports simultaneously within the models

Covariates were then added in steps. Progressively more complicated models added maternal and paternal demographics, maternal clinical health and maternal drug use during pregnancy. To ensure that the time difference between the interviews did not have an unexpected effect on the estimates, model d was also run accounting for the time difference between parental interviews (within 1 week of

each other vs. not). This variable was not significantly associated with either birth outcome in multivariate models, and the effect sizes and significance testing were not substantively changed with the addition of this variable. All models therefore exclude the time difference between parental interviews variable.

Commented [HJ16]: OK but it is more the people that reported months later that I would be worried about – a week or so does not seem so important – perhaps you should use a longer cut off?

Exploration of the Interaction of Mother's and Father's Relationship Quality Reports

Because the results of the regression models were contrary to the original hypothesis that maternal reports of relationship quality would be associated with the birth outcomes, I explored the possibility that maternal and paternal reports had an interactive effect on the birth outcomes. Subsequent models assessed the statistical interaction between maternal and paternal reports of the relationship quality variables conditioned on the same variables included in the full models (model d).

When the P value for the interaction term was less than 0.05, the slopes of the effect of maternal report on the outcome variable at varying levels of the paternal report were explored. First, plots of the effect of the paternal reports of a predictor on the outcome (birth weight or gestational age) controlling for all covariates in model d at 3 levels of the maternal reports of a predictor (low: 1 SD below the mean; medium: the mean; high: 1 SD above the mean) were created. Second, the significance of the slopes of the regression lines (controlling for all covariates in model d) at the three levels of the paternal predictor were assessed according to Aiken and West (1991).[45] Plots and significance testing were created using Daniel Yang's SAS macro "Test and plot a two-way interaction" with continuous variables,[46] which is based on Aiken and West's (1991) model for testing and interpreting interactions.[45]

Effect Measure Modification by Marital Status

To determine whether the association between relationship quality and birth outcomes differed by marital status, I tested for 2-way interactions between marital status and relationship quality by including interaction terms (e.g. marital status*relationship quality variable for mothers and fathers) in multivariate logistic regression models using the Wald test for product term (a p-value of <0.05 indicating significant interaction). When a significant interaction ($P<0.05$) was present between a relationship quality predictor variable and marital status, plots were created of the effect of the continuous predictor on the birth outcome by marital status. The significance of the simple slopes of the regression lines for married and unmarried respondents were determined.

c. Results

c.1 Descriptive Statistics

Demographics

Table II-4 describes the characteristics of the parents included in the sample for this analysis when employing the city weights. The mean birth weight was 3,328.~~37~~ 4 grams +/ SD and the mean gestational age at birth was 38.6~~3~~ weeks +/- SD. The average age of women and men was 27.0 +/- SD~~3~~ and 29.7 +/` SD~~2~~, respectively, and 58.~~47~~5% of parents were married. Women's and men's mean reported household income were just over $43,000.[a] Over half of the participants had a high school degree/equivalent or less education. Most participants were black (30.1~~06~~% women; 31.9~~1~~% men) or Hispanic (32.6~~1~~% women; 37.3~~26~~% men). Most parents (80.1~~4~~%) were interviewed within 1 week of each other.

Behavioral and Clinical Covariates

Cigarette use was somewhat common during pregnancy, with 13.~~29~~3% of women having smoked at some point during their pregnancy. 8.0~~4~~% of women had a pre-pregnancy diagnosis of a mental health problem. The vast majority of women started their prenatal care within the first three months of pregnancy (79.0~~8~~.~~99~~%). Over half of the women received federal or other assistance to pay for the hospital costs associated with their delivery (54.2~~5~~%). Nearly 12% of women had a sexually

Commented [HJ17]: 2 decimal points are unnecessary – suggests too fine a level of accuracy

[a] Data was collected in categorical form from the respondent and then they were given the mean value for that category. About 25% of data was missing. For married and cohabiting couples, the mother's report was used if available, and the father's report was used otherwise. If household income was missing for both parents, the income was imputed using Stata's regression-based impute command. Please see "Introduction to the Fragile Families Public Use Data" (2008)[38] for details..

transmitted infection (STI) or HIV during their pregnancy. ~~All behavioral and clinical covariates were abstracted from the medical record.~~

Relationship Quality Predictors

On average, mothers and fathers reported engaging in three out of four *positive activities* with each other in the previous month. The most common activity reported was helping each other solve a problem (91.~~37~~4% of mothers and 91.~~19~~2% of fathers) and the least common activity was going to a movie (66.1~~0~~% of mothers and 64.0~~5~~% of fathers).

The most common topic of *couple conflict* was money, with 54.6~~0~~% of mothers and 51.5~~47~~% of fathers reporting sometimes or often disagreeing about money in the last month. The second most common topic of conflict was spending time together, with 44.9~~87~~% of mothers and 46.2~~1~~% of fathers reporting sometimes or often disagreeing about spending time together in the last month. The least common topic was conflict about drug or alcohol use, with 9.5~~49~~% of mothers and 10.8~~3~~% of fathers reporting sometimes or often disagreeing about drug or alcohol use in the last month.

Almost 10% (9.9~~88~~%) of mothers and 10.1~~5~~% percent of fathers reported extreme *dissatisfaction with their relationship*. Parents were categorized as being extremely dissatisfied if they had a score of 24 or greater (range 6-30) on this scale. Over 5% (5.3~~4~~%) of mothers and 5.7~~68~~% of fathers reported very low support from their partner by reporting their partner never compromised, never expressed love, never encouraged important things and often criticized ideas.

Table II-5 shows that among fathers, most of the relationship quality predictor variables were significantly correlated with both birth weight and gestational age. Among mothers, however, couple activities, relationship satisfaction and relationship duration were significantly correlated with birth weight and only couple activities was significantly correlated with gestational age. Most of the covariates were significantly correlated with both birth outcomes.

Table II-6 shows that within couples, mother's and father's reports of relationship quality variables did not differ significantly. Mothers reported marginally more relationship satisfaction than their male partners (P=.06).

Table II-7 shows the correlation matrix between the relationship quality variables among mothers and fathers separately. The highest correlation between variables for both men and women was between couple conflict and partner support (r=-0.42, P<.001 mothers; r=-.031, P<.001 fathers). The higher the conflict reported, the lower the parents' report of their partner's support.

Table II-4. Descriptive statistics for subpopulation used in all analyses (singleton births, parents in a relationship, both the father and mother completed the survey and either or both birth weight and/or gestational age data was available from the medical record abstraction).

Descriptive Statistics (Using city weights)	MOTHERS				FATHERS			
	Total N	Mean	LCL	UCL	Total N	Mean	LCL	UCL
Birth weight (g)	2615	3328.37	3268.84	3387.90				
Gestational Age (weeks)	2630	38.63	38.38	38.88				
Positive Couple Activities	2603	3.24	3.11	3.36	2593	3.20	3.11	3.29
Couple Disagreements	2597	8.07	7.88	8.25	2585	8.06	7.86	8.26
Partner Support Behaviors	2480	10.77	10.55	11.00	2470	10.77	10.67	10.87
Relationship Satisfaction	2482	20.33	19.92	20.74	2446	19.87	19.50	20.23
Relationship Duration (mo) Before Preg	2562	78.30	71.40	85.20	2586	78.22	71.37	85.06
Age	2631	27.03	26.49	27.58	2632	29.72	29.06	30.38
Household Income (in thousands)	2632	43.90	38.68	49.12	2632	43.37	39.85	46.89
Number of children	2627	1.15	0.91	1.40	2615	1.12	0.98	1.27
	Total N	%			Total N	%		
Father Present at Birth	2627	95.72			2620	85.82		
Parents interviewed w/i 1 week of each other	2639	80.14						
Married	2632	58.47						
Education	2629				2632			
Less than HS		29.85				32.22		
HS or Equiv		31.92				27.62		
Some college or tech school		19.27				21.18		
College or Grad School		18.95				18.98		
Race/Ethnicity	2629				2632			
White		30.68				24.82		
Black		30.06				31.91		
Hispanic		32.61				37.26		
Other		6.65				6.01		
Drugs during pregnancy	2632	4.80						
Cigarettes during pregnancy	2632	13.29						
Alcohol during pregnancy	2632	5.78						
Mental Health Problems during pregnancy	2632	8.04						
Trimest PNC Start	2609							
Within 3 mo		78.99						
After 3 mo		18.41						
Never		2.60						
Payment for Delivery: Medicad/gov assistance/uninsured	2632	54.25						
Gestational diabetes	2632	8.01						
Pre-Eclampsia/Eclampsia	2632	4.87						
STI or HIV during Preg	2632	11.97						
Obesity	2632	8.76						
Baby Boy	2632	59.05						

Commented [HJ18]: If LCL and UCL are supposed to indicate 95% confidence levels – label them as 95% CIs. Again one decimal point. Why are the ns for the mothers and fathers different, shouldn't they be the same?

Commented [HJ19]: Since you found interaction by married/unmarried couples – It would help if you described some of these and other characteristics by marital status.

Table II-5. Correlations of relationship predictor variables and covariates with birth weight and gestational age conducted separately among mothers and fathers employing city weights.

	Birth weight		Gestational Age	
	Mothers	**Fathers**	**Mothers**	**Fathers**
Couple Activities Scale (0-4)	0.05**	0.06**	0.04*	0.05*
Couple Conflict Scale (x-x)	-0.05**	-0.08***	-0.02	-0.04†
Partner Support Scale (x-x)	0.03	0.00	0.02	-0.01
Relationship Satisfaction Scale (x-x)	0.03	-0.03	-0.01	-0.01
Relationship Duration in years	0.07***		-0.01	
Father at Birth		0.10***		0.11***
Father's Age		0.03		-0.04*
Mother's Age (ref: 20-34)				
<20	-0.05**		0.02	
35+	0.00		-0.03	
HH Income (in thousands)	0.07***	0.07***	0.01	0.00
Education (ref:< HS)				
HS or Equiv	-0.07***	-0.06**	-0.01	-0.03
Some college or tech school	0.04†	0.06**	0.00	0.03
College or Grad School	0.07***	0.07***	0.02	0.03
Parity	-0.02		-0.07***	
Paid w/ Medicaid or Uninsured	-0.11***		-0.04*	
Race (ref: white)			-0.08***	
Black	-0.17***	-0.17***	0.05**	-0.08***
Hispanic	0.11***	0.13***	0.00	0.06***
Other	0.01	0.00	-0.06**	0.01
Mental Health Problems	-0.07***			
Prenatal Care (ref: w/I first 3 mo)				
After 3 months	-0.04†		-0.02	
Never	-0.06**		-0.06**	
Gestational Diabetes	0.07***		-0.02	
Pre-eclampsia/Eclampsia	-0.11***		-0.11***	
Obesity	0.05*		0.00	
HIV/STI	-0.09***		-0.07***	
Child Gender	0.06**		-0.01	
Smoking	-0.15***		-0.07***	
Drugs	-0.11***		-0.08***	
Alcohol	-0.09 ***		-0.07 ***	

†=P<0.1; * P<0.05; ** P<0.01; ***P<0.001;

Commented [HJ20]: Rather than correlations would it make sense to do bivariate linear regressions so that you have crude beta estimates? If you do want to present correlations – did you use Spearmans rather than Pearsons for non-parametric data?

Table II-6. Paired T Tests comparing mother's and father's reports of the relationship quality predictors within couples.

	Mean Mother	Mean Fathers	Mean Diff	t	p
Positive Couple Activities	3.24	3.22	0.02	0.28	0.79
Couple Disagreements	8.07	8.07	0.02	0.20	0.85
Partner Support Behaviors	10.77	10.78	-0.02	-0.15	0.89
Relationship Satisfaction	20.33	19.89	0.45	2.12	0.06

Commented [HJ21]: Probably need to do paired rank sum tests since most likely the data are not normally distributed, and present medians rather than means? Would help to normalize the scales as well since they are all different – so make them all go from 0-1 (instead of some ranging from 0-4, others from 0-24, etc.) That way we can compare the scales across scales.

Table II-7. Correlation matrix of relationship quality variables for mothers and fathers.

a. MOTHERS	**Relationship Duration**	**Father at Birth**	**Relation-ship Sat**	**Partner Support**	**Conflict**
Positive Activities	0.03	0.27***	0.05*	0.27***	-0.09***
Conflict	-0.03	-0.08***	-0.09***	-0.42***	
Partner Support	0.02	0.14***	0.14***		
Relationship Sat	0.06**	0.01			
Father at Birth	0.02				
b. FATHERS	**Relationship Duration**	**Father at Birth**	**Relationship Sat**	**Partner Support**	**Conflict**
Positive Activities	0.01	0.25***	.02	0.22***	-0.07***
Conflict	-0.08***	-0.09***	-0.07***	-0.31***	
Partner Support	0.02	0.11***	0.2***		
Relationship Sat	-0.06**	-.04			
Father at Birth	0.02				

* P<0.05; ** P<0.01; ***P<0.001

c.2 Linear Regression with Birth Weight and Gestational Age

Relationship Quality and Birth Weight

Base models run separately for each relationship quality predictor variable, but that included both maternal and paternal reports and controlled for couple, city, hospital and marital status, showed that greater paternal report of conflict in the previous month was significantly associated with lower birth weight (B=-15.63 grams?; 95% CI –26.28,--4.98)(Table II-8). Thus, compared with babies born to fathers who reported no conflict with the baby's mother, babies born to fathers that reported the highest observed level of conflict (reported often disagreeing about all topics) with their partner were, on average, 187.56 grams lighter at birth. Results also showed that babies born to fathers who were present at the birth were on average 125.5~~1~~ grams (95% CIS 59.0, 192,0) heavier than babies born to fathers who were not present at birth ~~(B=125.51; 95% CI 59.03, 191.99)~~. No other maternal or paternal reports of relationship quality predictor variables were significantly associated with birth weight in ~~base~~ crude models. As a point of reference, recent studies have estimated that babies born to light smokers during pregnancy are on average 160 grams lighter at birth than babies born to non-smokers.[47] In this study, the full regression model shows that babies born to smokers were also, on average, 162.6~~0~~ grams lighter than babies born to non-smokers (Table II-10).

Commented [HJ22]: ? how does this match the beta above?

Table II-8. Bivariate linear regression models for birth weight. Models a-f were run separately for each relationship quality predictor variable, with both mother's and father's reports within the same model.

Model N	Birth Weight in grams	B	95% CI		
a	**Positive Couple Activities**				
N=2556	Women	8.71	-15.56	32.98	
	Men	18.21	-5.64	42.06	
b	**Couple Conflict**				
N-2544	Women	-4.67	-16.40	7.06	
	Men	-15.63	-26.28	-4.98	**
c	**Partner Support**				
N=2429	Women	7.73	-11.33	26.79	
	Men	-5.24	-23.63	13.15	
d	**Relationship Satisfaction**				
N=2309	Women	2.51	-5.62	10.63	
	Men	-1.76	-9.59	6.06	
e	**Baby's Father at Birth**				
N=2610		125.51	59.03	191.99	***
f	**Relationship Duration (mo)**				
N=2553		0.31	-0.15	0.76	

t P<0.1; * P<0.05; ** P<0.01; ***P<0.001

Commented [HJ23]: Help us understand the units of analysis for the scales – is difficult to interpret as each exposure variable is on a differnet scale – would help if they all from 0-1 or were standardized, as a 1 unit increase in each has a different interpretation?

Relationship Quality and Gestational Age

In base models with gestational age as the outcome that included both maternal and paternal reports, the only relationship quality predictor variable that was significantly associated with gestational age at birth was the baby's father's presence at the birth (Table II-9). Babies born to fathers who were not present at the birth were born, on average, 0.61 weeks (4.27 days) earlier than babies whose father was present at the birth (B=-?0.61; 95% CI 0.34, 0.88). As a point of reference, in this study, the full regression model (model d) shows that babies born to smokers were, on average, born nearly 1 day earlier (Table II-11).

Table II-9. Bivariate linear regression models for gestational age. Models a-f were run separately for each relationship quality predictor variable, with both mother's and father's reports within the same model.

Model N	Gestational Age in weeks?	B	95% CI		
a	**Positive Couple Activities**				
N=2571	Women	0.04	-0.06	0.13	
	Men	0.07	-0.02	0.16	
b	**Couple Conflict**				
N=2558	Women	-0.01	-0.05	0.04	
	Men	-0.04	-0.08	0.01	
c	**Partner Support**				
N=2682	Women	0.03	-0.04	0.11	
	Men	-0.04	-0.11	0.03	
d	**Relationship Satisfaction**				
N=2321	Women	-0.01	-0.04	0.02	
	Men	-0.01	-0.04	0.03	
e	**Baby's Father at Birth**				
N=2625		0.61	0.34	0.88	***
f	**Relationship Duration (mo)**				
N=2567		0.00	0.00	0.00	

t P<0.1; * P<0.05; ** P<0.01; ***P<0.001

c.3 Multivariate Linear Regression with Birth Weight and Gestational Age

Relationship Quality and Birth Weight

Multivariate models that included all of the maternal and paternal reports of the relationship quality predictor variables, and added confounders in a hierarchical fashion showed results similar to the results described above in the simpler base models (Table II-10, models a-d). In the final model (model d), which included all covariates, father's presence at the birth (B= 98.81, 95% CI 21.58, 176.04) was significantly associated with birth weight when controlling for marital status, city, hospital, couple, maternal and paternal demographics, maternal clinical health and maternal substance use during pregnancy (Table II-10, model d). The coefficient for father's presence at birth was reduced by 32.19 grams once all variables were added to the model, but remained statistically significant. This suggests that neither the confounders nor the potential mediators (e.g. smoking) account for the association of the father's presence at birth with birth weight.

Father's reports of conflict remained marginally significantly associated with birth weight (B=-11.54; 95% CI -23.54, 0.47) in the final model accounting for maternal and paternal demographics, maternal clinical/health and maternal substance use during pregnancy. With the addition of maternal substance use during pregnancy (models c to d), which could also be considered mediators as substance use may result from high levels of stress, the coefficient became marginally significant, but was reduced by only 0.91 grams.

Relationship Quality and Gestational Age

In multivariate models, father's reports of conflict (B= -0.05; 95% CI 0.11,-0.002) and father's presence at the birth (B= 0.51; 95% CI 0.19, 0.83) were significantly associated with gestational age at birth when controlling for all covariates (Table II-11, model d). The coefficient for father's report of conflict remained virtually unchanged with the addition of control variables (from -0.06 in model a to -

0.05 in model d), suggesting that neither the confounders nor the potential mediators account for the association between father's report of conflict and gestational age at birth. The coefficient for the father's presence at the birth was reduced the most with the addition of maternal and paternal demographic variables (from 0.63 in model a to 0.56 in model b) and only slightly reduced with the addition of maternal clinical health indicators and pregnancy substance use (0.51 in model d). For this variable, the confounders and potential mediators accounted for about 19% of the effect of father's presence at the birth on gestational age.

Commented [HJ24]: I don't think you can really say this.

Table II-10. Multivariate linear regression models predicting birth weight (grams)

Outcome: Birth Weight (g)																
	Model a N=2068				Model b N=2063				Model c N=2063				Model d N=2063			
	B	95% CI			B	95% CI			B	95% CI			B	95% CI		
Positive Couple Activities																
Mother	10.25	-18.31	38.81		1.73	-26.69	30.14		2.68	-25.35	30.70		4.65	-23.00	32.29	
Father	12.56	-15.73	40.85		-0.36	-28.76	28.04		2.35	-25.73	30.42		4.01	-23.99	32.01	
Couple Conflict																
Mother	-6.16	-19.96	7.64		-3.12	-16.99	10.75		-2.59	-16.48	11.29		0.10	-13.93	14.13	
Father	**-16.99**	**-29.18**	**-4.79**	**	**-13.69**	**-25.78**	**-1.60**	*	**-12.45**	**-24.51**	**-0.40**	*	**-11.54**	**-23.54**	**0.47**	t
Partner Support																
Mother	-1.87	-25.69	21.96		-5.68	-29.52	18.16		-6.52	-30.21	17.18		-6.09	-29.55	17.38	
Father	-18.87	-40.88	3.14	t	-17.23	-39.27	4.82		-19.12	-40.73	2.49	t	-20.85	-42.30	0.61	t
Relationship Satisfaction																
Mother	0.55	-8.09	9.19		1.56	-6.94	10.05		1.44	-7.02	9.90		0.87	-7.48	9.22	
Father	-1.23	-9.59	7.14		0.34	-7.95	8.63		0.12	-8.12	8.37		0.15	-8.05	8.36	
Baby's Father at Birth	**131.00**	**51.75**	**210.26**	**	**110.74**	**31.97**	**189.50**	**	**99.01**	**20.94**	**177.08**	**	**98.81**	**21.58**	**176.04**	*
Relationship Duration (mo)	0.49	-0.03	1.02	t	0.58	0.05	1.12	*	0.47	-0.07	1.01	t	0.41	-0.13	0.94	
Maternal Demographics																
Married	95.65	32.02	159.27	**	17.70	-54.00	89.40		27.66	-43.36	98.68		8.65	-62.17	79.46	
Age (reference: 20-34)																
<20					-27.12	-101.36	47.12		-10.80	-85.72	64.13		-13.35	-87.35	60.64	
35+					-93.26	-203.15	16.62	t	-83.86	-192.39	24.67		-73.79	-180.34	32.75	
HH Income (in thousands)					-1.20	-2.83	0.42		-1.13	-2.74	0.48		-1.19	-2.79	0.42	
Education (reference:less than HS)																
HS or Equiv					-22.45	-92.73	47.83		-33.03	-103.70	37.65		-37.32	-106.97	32.32	
Some college or tech school					20.52	-62.85	103.89		9.82	-73.49	93.14		-2.10	-84.31	80.11	
College or Grad School					53.56	-78.98	186.10		48.14	-83.94	180.22		20.82	-109.85	151.49	
Parity					15.18	-8.05	38.41		16.82	-6.10	39.74		18.85	-4.23	41.93	
Paid w/ Medicaid or was Uninsured					-92.27	-155.11	-29.42	**	-65.80	-128.21	-3.39	*	-64.69	-127.12	-2.26	*
Race/Ethnicity (reference: white)																
Black					-85.26	-222.37	51.85		-97.36	-236.43	41.72		-123.51	-264.36	17.34	t
Hispanic					29.78	-78.98	138.54		23.95	-85.68	133.58		-13.88	-123.02	95.27	
Other					-83.58	-240.92	73.75		-121.93	-277.63	33.77		-149.43	-308.36	9.51	t
Paternal Demographics																
Age					-3.47	-8.81	1.87		-3.39	-8.58	1.80		-1.73	-6.92	3.47	
HH Income (in thousands)					0.82	-0.78	2.43		0.79	-0.77	2.36		0.74	-0.83	2.31	
Education (reference:less than HS)																
HS or Equiv					47.04	-19.22	113.31		43.56	-22.36	109.48		31.00	-35.15	97.15	
Some college or tech school					132.48	47.67	217.30	**	132.99	49.41	216.57	**	119.90	36.76	203.04	**
College or Grad School					119.46	1.54	237.37	*	122.39	6.04	238.73	*	88.35	-27.92	204.62	
Race/Ethnicity (reference: white)																
Black					-56.58	-198.63	85.46		-55.29	-198.09	87.51		-63.85	-206.47	78.77	
Hispanic					66.08	-49.88	182.04		57.33	-60.29	174.94		41.05	-74.99	157.09	
Other					-27.43	-196.05	141.19		-3.25	-171.03	164.53		-12.73	-182.69	157.22	
Maternal Clinical Health																
Mental Health Problems									-73.38	-161.72	14.97		-8.10	-100.00	83.81	
Prenatal Care (reference: w/I first 3 mo)																
After 3 months									-43.23	-110.99	24.52		-23.25	-89.36	42.87	
Never									-97.71	-264.03	68.60		-81.34	-245.05	82.36	
Gestational Diabetes									129.62	12.72	246.52	*	110.85	-6.78	228.48	t
Pre-ecamplsia/Eclampsia									-315.96	-472.14	-159.79	***	-329.74	-483.68	-175.80	***
Obesity									140.85	37.95	243.75	**	144.87	41.77	247.98	**
HIV/STI									-32.78	-106.64	41.07		-28.26	-101.71	45.18	
Child Gender									71.39	21.49	121.29	**	71.34	21.75	120.92	**
Maternal Pregnancy Substance Use																
Smoking													-162.60	-234.49	-90.71	***
Drugs													-52.42	-153.20	48.36	
Alcohol													-88.71	-215.56	38.15	

All models account for marital status, city, hospital and couple in the cluster statement

* P<0.05; ** P<0.01; ***P<0.001

Table II-11. Multivariate linear regression models predicting gestational age (weeks)

Outcome: Gestational Age (w)																
	Model a N=2077				Model b N=2072				Model c N=2072				Model d N=2072			
	B	95% CI			B	95% CI			B							
Positive Couple Activities																
Mother	0.04	-0.08	0.15		0.00	-0.11	0.12		-0.01	-0.12	0.11		-0.01	-0.12	0.11	
Father	0.03	-0.08	0.14		0.00	-0.11	0.11		0.00	-0.11	0.11		0.01	-0.10	0.12	
Couple Conflict																
Mother	-0.01	-0.07	0.05		0.00	-0.06	0.06		0.01	-0.05	0.06		0.01	-0.05	0.07	
Father	**-0.06**	**-0.11**	**-0.01**	*	**-0.06**	**-0.11**	**-0.01**	*	**-0.06**	**-0.11**	**0.00**	*	**-0.05**	**-0.11**	**0.00**	*
Partner Support																
Mother	-0.03	-0.12	0.07		-0.04	-0.14	0.06		-0.03	-0.13	0.07		-0.03	-0.13	0.07	
Father	-0.04	-0.12	0.05		-0.04	-0.12	0.05		-0.05	-0.13	0.04		-0.05	-0.14	0.03	
Relationship Satisfaction																
Mother	-0.01	-0.05	0.02		-0.01	-0.05	0.02		-0.01	-0.04	0.02		-0.01	-0.04	0.02	
Father	-0.01	-0.04	0.02		-0.01	-0.04	0.03		-0.01	-0.04	0.03		-0.01	-0.04	0.03	
Baby's Father at Birth	**0.63**	**0.30**	**0.96**	***	**0.56**	**0.23**	**0.89**	***	**0.51**	**0.19**	**0.84**	**	**0.51**	**0.19**	**0.83**	**
Relationship Duration (mo)	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	
Maternal Demographics																
Married	0.09	-0.15	0.32		-0.01	-0.29	0.26		0.03	-0.24	0.30		0.00	-0.27	0.27	
Age (reference: 20-34)																
<20					0.12	-0.18	0.41		0.15	-0.15	0.45		0.15	-0.15	0.44	
35+					-0.07	-0.48	0.35		-0.02	-0.42	0.39		0.01	-0.39	0.41	
HH Income (in thousands)					0.00	-0.01	0.01		0.00	-0.01	0.01		0.00	-0.01	0.01	
Education (reference:less than HS)																
HS or Equiv					0.12	-0.16	0.40		0.08	-0.20	0.36		0.08	-0.20	0.36	
Some college or tech school					0.07	-0.26	0.40		0.04	-0.29	0.37		0.03	-0.30	0.36	
College or Grad School					0.09	-0.42	0.60		0.05	-0.45	0.56		0.02	-0.48	0.53	
Parity					-0.04	-0.14	0.05		-0.05	-0.15	0.04		-0.05	-0.14	0.04	
Paid w/ Medicaid or was Uninsured					-0.16	-0.40	0.08		-0.10	-0.34	0.15		-0.09	-0.34	0.15	
Race/Ethnicity (reference: white)																
Black					-0.04	-0.57	0.49		-0.01	-0.55	0.52		-0.02	-0.56	0.53	
Hispanic					0.06	-0.38	0.49		0.06	-0.38	0.50		0.03	-0.41	0.48	
Other					-0.23	-0.73	0.27		-0.33	-0.84	0.18		-0.36	-0.88	0.15	
Paternal Demographics																
Age					-0.02	-0.04	0.01		-0.01	-0.03	0.01		-0.01	-0.03	0.01	
HH Income (in thousands)					0.00	-0.01	0.01		0.00	-0.01	0.01		0.00	-0.01	0.01	
Education (reference:less than HS)																
HS or Equiv					0.14	-0.12	0.41		0.15	-0.12	0.41		0.12	-0.16	0.39	
Some college or tech school					0.36	0.03	0.70	*	0.35	0.02	0.69	*	0.32	-0.02	0.65	t
College or Grad School					0.41	-0.03	0.84	t	0.39	-0.04	0.82	t	0.33	-0.11	0.77	
Race/Ethnicity (reference: white)																
Black					-0.13	-0.67	0.41		-0.14	-0.69	0.40		-0.17	-0.72	0.37	
Hispanic					0.16	-0.30	0.61		0.13	-0.33	0.59		0.09	-0.37	0.55	
Other					-0.03	-0.62	0.56		0.04	-0.55	0.63		0.02	-0.58	0.61	
Maternal Clinical Health																
Mental Health Problems									-0.18	-0.52	0.17		-0.02	-0.39	0.35	
Prenatal Care (reference: w/I first 3 mo)																
After 3 months									-0.05	-0.33	0.23		-0.01	-0.28	0.26	
Never									-0.34	-1.23	0.55		-0.32	-1.20	0.57	
Gestational Diabetes									-0.12	-0.50	0.25		-0.15	-0.52	0.22	
Pre-ecamplsia/Eclampsia									-1.31	-1.91	-0.70	***	-1.32	-1.92	-0.72	***
Obesity									0.13	-0.29	0.55		0.14	-0.28	0.56	
HIV/STI									-0.33	-0.64	-0.02	*	-0.32	-0.63	-0.01	*
Child Gender									-0.04	-0.24	0.16		-0.04	-0.24	0.16	
Maternal Pregnancy Substance Use																
Smoking													-0.14	-0.43	0.15	
Drugs													-0.26	-0.68	0.17	
Alcohol													-0.39	-0.89	0.10	
All models account for marital status, city, hospital and couple in the cluster statement																
* P<0.05; ** P<0.01; ***P<0.001																

d.4 Interaction of Parental Reports

There were significant interactions between maternal and paternal reports of couple conflict in the association with birth weight (B=-27.99, t=-2.48, SE=P=.01). No other interaction terms were significant at the P<0.05 level.

Commented [HJ25]: Is this the beta for the interaction term? IF so not really interpretable.

As shown in Figure II-2, I further explored the association between paternal reports of couple conflict with birth weight at three levels of maternal report of couple conflict controlling for all variables in the full model (model d): low: 1 SD below the mean; medium: the mean; high: 1 SD above the mean using Aiken and West (1991) as a guide.[45]

Commented [HJ26]: This is a bit hard to interpret as well – what do you think the figure is telling us?

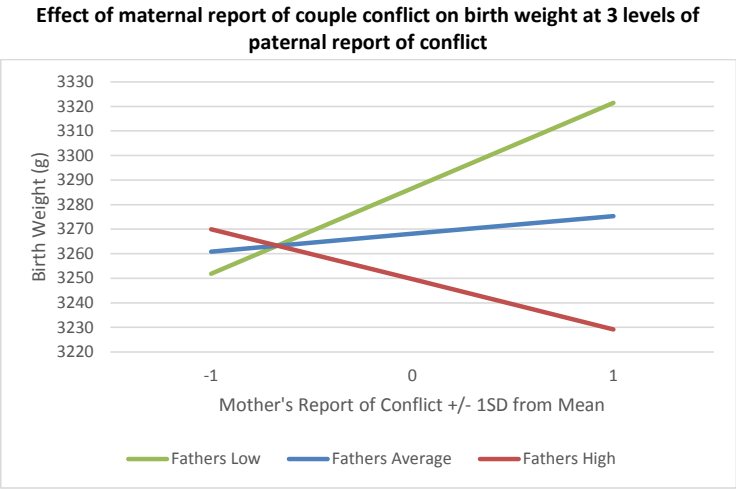

Figure II-2. Effect of maternal report of couple conflict on birth weight at three levels of paternal report of couple conflict: low: 1 SD below the mean; medium: the mean; high: 1 SD above the mean.

d.5 Effect Measure Modification by Marital Status

There was a significant interaction between paternal report of couple conflict and marital status in the association with birth weight (B=27.27, 95% CI 1.08, 53.46, P=.04). When looking at simple slopes, among unmarried fathers, those who reported greater couple conflict had babies with lower birth weight on average (B=-14.92, 95% CI -28.24, -1.61, P=.03). The association between ~~relationship satisfaction~~couple conflict? and birth weight was not significant among married fathers (Figure II-3). To explore whether the effect of fathers report of conflict on birth weight among unmarried men was driven by unmarried men reporting more conflict on average, I added the interaction term between marital status and father's report of conflict into the interaction model with maternal and paternal report of couple conflict (section d.4). The interaction between maternal and paternal report of couple conflict remained significant, the effect size did not change substantially and the interaction between paternal report of conflict and marital status was not significant. This result suggests that the effect of paternal report of conflict on birth weight is not driven by unmarried men reporting higher average conflict in general. The interaction between paternal report of conflict and marital status was not significant.

Commented [HJ27]: This section is confusing – not sure what you are testing – it seems like for both outcomes two exposures seemed important paternal reports of couple conflict and fathers presence at birth – so you would want to see whether marital status interacts with both exposures (conflict and presence at birth) for both outcomes (birth weight and gestational age). This would make it easier for the reader to follow (I think).

Commented [HJ28]: This last sentence is confusing as it seems to contradict the first sentence (?). I am having a hard time following what you did here.

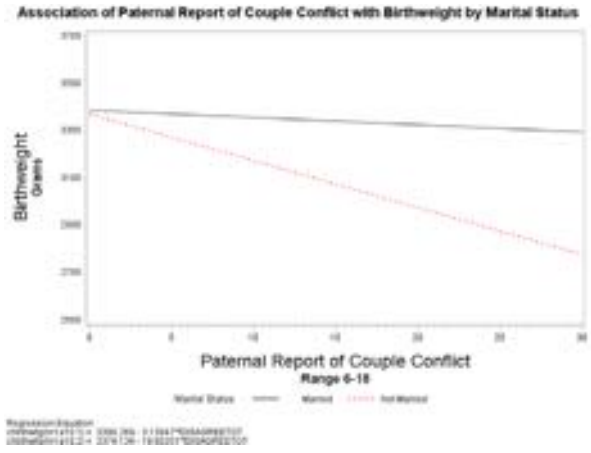

Figure II-3. Effect measure modification of the association between paternal report of couple conflict and birth weight by marital status.

There was a significant interaction between relationship duration and marital status in the association with birth weight (B=-1.07, 95% CI -2.10, -0.04, P=.04). When looking at simple slopes, among unmarried couples, those who reported greater relationship duration had babies with greater birth weight on average (B=0.75, 95% CI .08, 1.42, P=0.03). The association between relationship duration and birth weight was not significant among married couples (Figure II-4).

Commented [HJ29]: Not clear why you did not see whether the same interaction with marital status and paternal conflict was also seen with gestational age?

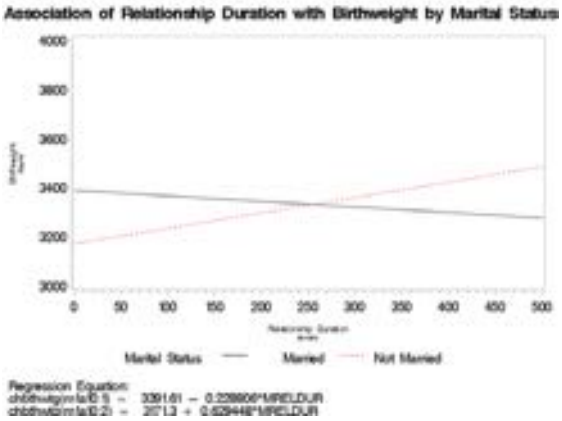

Figure II-4. Effect measure modification of the association relationship duration and birth weight by marital status.

Marital status did not interact significantly with any other relationship quality predictor variables when predicting birth weight.

Marital status did not interact significantly with any relationship quality variables when predicting gestational age at birth.

d. Comment

Among this national sample of married and unmarried parents in a relationship, the father's report of conflict with his partner over the previous month and the father's presence at birth were both significantly associated with having a baby with a lower birth weight and an earlier gestational age at birth after controlling for maternal and paternal demographic factors, maternal pregnancy clinical health and maternal substance use during pregnancy. The effect sizes of findings were substantial. Babies born to fathers who fell into the highest quartile of conflict were 69.68 grams lighter than babies born to fathers who fell into the lowest quartile of conflict after controlling for all covariates. Additionally, babies born to fathers who were not present at the birth were nearly 99 grams lighter after controlling for all covariates. Estimates show that babies born to *light* smokers during pregnancy are on average 160 grams lighter at birth than babies born to non-smokers. Therefore, these effect sizes are not neglegible.[47]

Commented [HJ30]: I think it would help the reader if you would summarize all of the findings in a summary paragraph and then discuss each separately – hard to remember what you found since there were many exposures/predictors. And also hard to remember exactly what you found with effect measure modification by marital status.

Commented [HJ31]: But the conflict variable really only had an effect in unmarried couples right? Based on the interaction in that model – did you test for interaction in the other model?

Conflict in a relationship and the association with birth outcomes

Conflict in a romantic relationship can cause serious stress among both members of an expectant couple and the evidence from this study supports the hypothesis that this conflict can have a deleterious effect on two important birth outcomes: birth weight and gestational age. A plethora of studies have shown that women's experiences of stress during pregnancy are associated with PTB[13,16–19] and LBW.[16,17,20,21] The findings from the current research show that men's experiences of conflict within a relationship have a significant association with negative birth outcomes, suggesting that men's experiences and feelings when they are expecting a baby may have a unique contribution to poor birth outcomes.

Recent evidence has demonstrated that elevated levels of stress hormones, such as cortisol, among pregnant women are associated with lower birth weight[48] and lower gestational age at birth.[49] A

recent study by Feinberg et al. (2013), however, showed that salivary cortisol levels were elevated among both partners in an expecting couple in response to conflict within their relationship. Emotional contagion research has shown that feelings and emotions among members of a romantic couple tend to spill-over from one member of the couple to the other.[50] Thus, men's and women's stress reactions may converge and ultimately have an interactive effect on birth outcomes. Consistent with this research, the results of the interaction between maternal and paternal reports of conflict suggest that the average birth weight was the lowest when both parents reported high levels of conflict with their partner. Further, the results suggest that the mother's report of conflict is protective--when mothers perceive low levels of conflict, the father's report of conflict does not have an effect on birth weight; however, ~~at~~ when mothers report high levels of conflict, the greater the father's the report of conflict the worse it is for the baby.

Commented [HJ32]: Not sure I see where you are getting this from?

Differences in the association of relationship quality with birth outcomes by marital status

Many studies have demonstrated that babies born to married parents, on average, have greater birth weight and a longer gestation compared to babies born to unmarried parents.[51] We know little, however, beyond associated socioeconomic status, about what about being unmarried or married affects birth outcomes. The results from this study show that paternal reports of conflict were only significantly predictive of lower birth weight among *unmarried* fathers. This finding is consistent with previous qualitative research showing that married and unmarried couples perceive tensions in their relationship differently. Waller (2008) found that unmarried couples felt tensions were a greater risk to the stability of their relationship.[35] Conflict in a relationship is a fact of life; however, the results of this study may suggest that couple conflict may cause more stress among unmarried couples than married couples, and therefore have a more negative effect on birth outcomes among unmarried couples.

In addition, relationship duration was only predictive of greater birth weight among *unmarried* couples in this study. It is possible that being married is a useful indicator of a committed relationship with more resources to support a healthy pregnancy; however the story is more nuanced among unmarried couples where the duration of the relationship may matter more. This finding may suggest that among unmarried couples, those who have been in a relationship longer may have developed healthier relationships (e.g. better ways to deal with conflict) that can support a healthier pregnancy than unmarried couples who have known each other for a shorter period of time.

Commented [HJ33]: This is why it would help to see some of the characterisitics – what was the average duration of marriage versus partnership status before marriage – were the distributions similar or was there more variability (especially in terms of shorter relationships in the unmarried group)?

The association of the baby's father's presence at birth with birth outcomes

In the current study, the baby's father's presence at the birth was significantly associated with both the baby's birth weight and gestational age at birth among married and unmarried couples alike. In fact, the magnitude~~size~~ of the effect on birth weight is similar to ~~right up there with~~ the effect of light smoking during pregnancy on birth weight.[47] Whether the baby's father was present at the birth may be a useful way to discern between pregnancies that are more at risk for negative birth outcomes (and potentially poor child health outcomes later). The baby's father's presence at the birth may be a marker of the father's involvement and support, both material and emotional, during the pregnancy. As theorized by Alio et al (2010), support from the baby's father during pregnancy may decrease maternal stress and encourage healthy behaviors, ultimately leading to better birth outcomes.[27]

A study by Teitler (2001) among unmarried couples only within the Fragile Families study, however, did not find that the father's presence at the hospital for the baby's birth or visited around that time had an effect on the risk for low birth weight.[29] Teitler (2001) did find that the father's presence at the birth had a positive effect on maternal health behaviors, however.[29] Thus, this study is unique in that it found a significant association between the baby's father's presence at the birth and both birth weight and gestational age among the Fragile Families population after controlling for

Commented [HJ34]: Did you test for interaction here as well?

maternal and paternal demographics, and maternal clinical health and substance use during pregnancy. The differences between Teitler's (2001) findings and the findings in this study are likely due to the fact that 1) Teitler's analysis only included unmarried couples, while this analysis uses all couples in a relationship; 2) Teitler used a dichotomous measure of low birth weight, while this study looked at the continuous forms of birth weight and gestational age abstracted from the medical record and 3) Teitler used the mother's report of whether the father was present at the birth, whereas this study uses the father's report of his own actions (though Teitler reports that the results were substantively the same using father report).

Limitations

While this study has many strengths, it is not without limitation. This secondary data analysis is limited by the study design and the measures collected. The timing of assessments are of some concern. Parents' report of their relationship quality was assessed shortly after the birth of their baby, raising concern over the issue of reverse causality. It is possible, though unlikely, that having a child born with a low birth weight or too early could cause parents to reflect more negatively about their relationship with their partner due to the stress that they are under. In addition, the fathers and mothers were not always interviewed on the same day, thus their perspectives on their relationship may differ due to the elapsed time and events that may have occurred within this time, rather than true differences in how they perceived their relationship quality. A sensitivity analysis was conducted comparing the results among couples that were interviewed within one week of each other versus the more than one week, and the results among the two groups were substantively the same.

Commented [HJ35]: This is could although – above you said you adjusted for it in the model which is different from running the model with the sub sample that reported within a week and again it Is the long time dirsuptions that would concern me more – would help if you would describe the time different – average, range, etc, in a bit more detail in the descriptive section so that we know how concerned we should be about it.

As with all observational studiest, there could be ~~Another concern is over whether there are\~~ important omitted ~~variables~~ confounders that could explain the relationship between relationship quality factors and the birth outcomes. Unfortunately, due the limitations of the study design and

measures collected, we cannot tease out unmeasured confounding of the association between relationship quality and birth outcomes by some other parental characteristic (e.g. personality, depression) that would affect both the exposure and outcome.

Strengths

Despite these limitations, this study provides an expanded and more comprehensive assessment of relationship quality and its association with birth outcomes compared to previous studies which have been limited to assessing paternal social support, markers of paternal involvement (e.g. father's name on birth certificate, paternal financial contributions) and intimate partner violence.[27–29,52] This study also included direct report of relationship quality from the fathers, while most studies use reports only from mothers, and included both maternal and paternal reports within the same statistical model while accounting for clustering by couple. This study was thereby able to show that men's experiences and feelings when they are expecting a baby may have a unique contribution to poor birth outcomes—something that no other study has ever done.

Commented [HJ36]: Which was noticeably lacking here – were there no measures of IPV?

Implications for Future Research and practice

This study suggests that dimensions of relationship quality, and most saliently couple conflict and the baby's father's absence at the birth, are associated with birth outcomes at a level that is nearly commensurate with the effect of light smoking on birth outcomes. Further, in this study, men's report of his experiences of conflict had an effect on birth outcomes while the mother's reports acted only in concert with their partner's report. Our nation has spent the last several decades focusing on changing maternal behaviors (e.g. smoking during pregnancy and attending prenatal care) to improve population rates of low birth weight and preterm birth with little luck. Programs and policies that not only address

Commented [HJ37]: Not sure that I understand this statement.

the importance of healthy romantic relationships, but that also include both members of an expectant couple, may help support healthier pregnancies and improve the rates of negative birth outcomes.

Overall excellent work, Anna and very interesting. It would help if you would clarify the EMM section in a bit more detail and in the discussion, I would like to see more about why the father being at the delivery is important – seems like a measure of social support of a kind. Also would help if you describe/interpret the correlations between the measures – so couples with high conflict tended to not have the father present at birth, etc., and justify a bit how these are all measuring different things, so that it makes sense to include them all in the same model (versus if they are highly collinear).

Great work overall – hope these comments are helpful!

Appendix II-1. Variable descriptions and details.

Construct	Measure and Reference	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
Exposures: Relationship Quality						
Positive Couple Activities	Original to Fragile Families	4 items asked whether they had done positive activities with baby's father/mother (e.g. went out to a movie, helped each other solve a problem)	1=Yes 0=No	Baseline	Last month	-Responses summed to form an index -Higher scores correspond to more positive activities (range: 0-4) (α=0.64 w, 0.60 m)
Couple Conflict	Adapted from National Survey of Family Health[39]	6 items assessed frequency of disagreements about specific topics (e.g. money, sex, being faithful)	1= never 2= sometimes 3= often	Baseline	Last month	-Responses summed to form a continuous scale -Higher scores correspond to more disagreement/more conflict (range: 6-18) (α=0.65 w, 0.64 m)
Partner Support	Adapted from Multidimensional Support Scale (MDSS)[40,41] and Susan Loyd's Effects of Violence on Work and Family project.	4 items assessed frequency of supportive and destructive behavior toward respondent by the baby's father/mother (e.g., s/he is fair and willing to compromise, s/he insults or criticizes you or your ideas)	1= often 2= sometimes 3= never	Baseline	Current	-Responses summed to form a continuous scale -Supportive behaviors were reverse scored. -Higher scores correspond to more partner support (range: 4-12) (α=0.60w, 0.59 m)
Relationship Satisfaction	Original to Fragile Families	6 items ask how life might be different if they were married to the baby's father/mother (for unmarried) or not married to the baby's father/mother (for married) (e.g. financial security, happiness)	4-point scale ranging from 5=much worse to 1=much better	Baseline	Current	-Responses summed to form a continuous scale -Responses from unmarried respondents were reverse scored. -Higher scores correspond to more partner/relationship satisfaction (range: 6-30) (α=0.72 w,0 .67m)
BF present at birth	--	Asked baby's father whether he was present at the birth	1=Yes 0=No	Baseline	--	Dichotomous

Relationship Duration	--	Asked mothers years and/or months they knew the baby's father before the pregnancy	Months	Baseline	--	Continuous (range: 0-432)
Birth Outcomes						
Birth Weight	Weight at birth	--	Grams	Medical Records	--	Continuous (range : 470-5,585)
Gestational Age at Birth	Weeks pregnant at birth	--	Weeks	Medical Records	--	Continuous (range: 23-46)
Effect Measure Modifier						
Marital Status	--	Asked whether currently married to father of the baby	1=Yes 2=No	Baseline	Current	Dichotomous
Confounders						
Age	--	Summary variable created by FF from birth date.	--	Baseline	Current	Continuous (range:15-43 women 15-53 men)
Household Income	--	Asks: "Thinking about your income and the income of everyone else who lives with you, what was your total household income before taxes in the past 12 months?"	1= < $5,000 2= $5,000 to $9,999 3= $10,000 to $14,999 4= $15,000 to $19,999 5= $20,000 to $24,999 6= $25,000 to $34,999 7= $35,000 to $49,999 8= $50,000 to $74,999 9= > $75,000	Baseline	Current	Categorical
Education	--	Asks the highest grade or year of regular school that they have completed.	1= < high school 2= high school/equiv 3= some coll, tech 4= coll or grad	Baseline	Current	Categorical
Race/Ethnicity	--	Asks which category best describes their race and ethnicity.	1= White 2= Black 3= Hispanic 4= Other	Baseline	Current	Categorical
MATERNAL ONLY						
Parity	--	From medical record *before* the index child was born.	--	Baseline & Medical Records	Current	Continuous (range: 0-12)
Paid for birth with	--	Payment for delivery	1=Yes	Medical Records	--	Dichotomous

Medicaid or was uninsured		indicated as Medicaid, partial Medicaid, Uninsured or other government program	0=No			
Smoking During Pregnancy	--	Mother smoked cigarettes during pregnancy, from all possible sources in the medical record	1=Yes 0=No	Medical Records	During Pregnancy	Dichotomous
Drug Use During Pregnancy	--	Mother used drugs during pregnancy, from all possible sources in the medical record	1=Yes 0=No	Medical Records	During Pregnancy	Dichotomous
Alcohol Use During Pregnancy	--	Mother used alcohol during pregnancy, from all possible sources in the medical record	1=Yes 0=No	Medical Records	During Pregnancy	Dichotomous
Trimester Prenatal Care Initiated	--	Variable constructed by FF that indicates the trimester prenatal care was initiated	1= First Trimester 2=Second Trimester 3=Third Trimester	Medical Records	During Pregnancy	Categorical
Mental Illness Pre-Pregnancy	--	Mother had pre-pregnancy diagnosis of mental illness, from all possible sources in medical record	1=Yes 0=No	Medical Records	Pre-Pregnancy Diagnosis	Dichotomous
Pre-Existing Diabetes	--	Mother had pre-pregnancy diagnosis of diabetes, from all possible sources in medical record	1=Yes 0=No	Medical Records	Pre-Pregnancy Diagnosis	Dichotomous
Pre-Existing Hypertension	--	Mother had pre-pregnancy diagnosis of hypertension, from all possible sources in medical record	1=Yes 0=No	Medical Records	Pre-Pregnancy Diagnosis	Dichotomous
Time between Mother and Father Interviews	--	Days between parental interviews	Days	Baseline	After Delivery	Continuous (range: 0-32)

Appendix II-2. Measure details, validity and reliability

The following summary variables were created using items from the Fragile Families and Child Well Being Study Baseline Survey of Parents.[53]

Positive Couple Activities

The following 4 items comprising the positive couple activities measure were developed for the Fragile Families study. The 4 questions listed below asked parents whether they had done positive activities with the baby's father/mother in the last month or the last month they were together (1=Yes, 0=No). A total positive couple behavior score was created by summing the responses (α =0.64 mothers and 0.60 fathers; range 0-4).

I'm going to read you some things that couples often do together. Tell me which ones you and [BABY'S FATHER/MOTHER] have done together in the past month

1. *visited with friends*
2. *went out to a movie, sporting event, or some other entertainment*
3. *ate out in a restaurant*
4. *helped each other solve a problem*

No specific validity information is provided by the principal investigators; however, this measure has been successfully employed as an indicator of relationship quality using Fragile Families data. A study among adolescents and young adults in the FF study used the four items assessing joint participation in activities together (KR20=.67 for fathers; KR20=.74 for mothers). More positive couple activities reported by the mother predicted more father involvement 3 years later.[37]

Couple Conflict

This measure was loosely adapted from the National Survey of Family Health.[39] Questions asked parents how often they had disagreements about six topics listed below. Parents responded on a three point scale ranging from 3=often, 2=sometimes, 1=never. Responses were summed to form a continuous score, with higher scores indicating less conflict and more agreement in the relationship (Chronbach's α= 0.65 mothers and 0.64 fathers; range 6-18).

The following is a list of subjects on which couples often have disagreements. How often, if at all, in the last month have you and [BABY'S FATHER/MOTHER] had disagreements about each of the following:

1. *money*
2. *spending time together*
3. *sex*
4. *the pregnancy*
5. *drinking or drug use*
6. *being faithful*

Results of formal tests of the measure's validity have not been reported, however, several analyses of Fragile Families data have used this measure as an indicator of relationship quality. A study assessing relationship conflict and union formation used the 6 items about relationship conflict. The frequency of conflict was represented by the mean of parents' reports about whether they "never" (1), "sometimes" (2), or "often" (3) had conflict over the six items in the last month. Reports of conflict had inconsistent effects. Only father's reports of conflict significantly deterred cohabitation.[54] No chronbach's alpha was reported.

Another study found that couple conflict measured using maternal report of these items (chronbach's α =0.65) predicted poor maternal prenatal health behaviors.[55] A study among adolescents and young adults in the FF study used conflict items (α =0.64 mothers and 0.62 fathers) to predict father involvement. Disagreements reported by both mothers and fathers were not significantly associated with father involvement 3 years later.[37]

Partner Support

This measure was loosely adapted from the Winefield et al. Multi-Dimensional Support Scale (MDSS). Five questions asked parents how often the mother or father of their baby displayed supportive or destructive behavior toward the respondent. Parents responded on a three point scale ranging from 1=often, 2=sometimes, 3=never about the items listed below. Support (positive) behaviors were reverse-scored when creating a total score, which summed the responses. Higher scores indicate more supportive and less destructive behaviors toward the respondent. Factor analysis using maximum likelihood indicated that the "s/he hits or slaps you when angry" item did not load above 0.32 (standard threshold)[56] on to the partner support factor. Therefore, this item was excluded and a four item variable using the other items was created (α =0.60 mothers and 0.59 fathers; range 4-12).

Thinking about your relationship with [BABY'S FATHER/MOTHER], how often would you say that:

1. *s/he is fair and willing to compromise when you have a disagreement*
2. *s/he hits or slaps you when angry (*not include in summary variable)
3. *s/he expresses affection or love for you*
4. *s/he insults or criticizes you or your ideas*
5. *s/he encourages or helps you do things that are important to you*

Alpha coefficients are generally high for the MDSS (>.75) and the subscale scores correlate well with affect measures (e.g. depressive affect, self-esteem, psychological disturbance).[41]

Several analyses of Fragile Families data have used this measure, in different forms, as an indicator of relationship quality. A 9-item version was used 1 year postpartum among Fragile Families Fathers. These 9 items included the 5 items assessed at baseline. The author dichotomized the outcome (sometime and often vs. never). Chronbach's α was 0.90 for married fathers and 0.93 for unmarried fathers. Relationship quality predicted perceptions of co-parental support for married fathers but not unmarried fathers.[57]

A 6 item version (which included the 5 items included in this analysis) was used 1 year postpartum among Fragile Families mothers and fathers. Authors averaged the scores for mothers and fathers

(chronbach's α =0.76). Better relationship quality predicted greater parental engagement in infant and toddler years, with married and cohabiting couples similar in the association.[58]

A 4 item version ("insults or criticizes you or your ideas,""expresses affection or love for you," "is fair and willing to compromise," and "encourages and helps you to do things.") using baseline assessments from all mothers significantly predicted (chronbach's α =0.66) breastfeeding rates only among African Americans.[59]

Relationship Satisfaction

The items for this measure were developed specifically for the Fragile Families Study. The 6 items ask how life might be different if they were married to the baby's father/mother (for unmarried couples) or *not* married to the baby's father/mother for the married couples). Couples reported responses to the following items on a scale from 1=much better to 5=much worse. The responses for unmarried respondents were reverse scored with the theory that if they rated that the items would be worse with marriage, they were demonstrating a lack of satisfaction with their partner and/or relationship. Coding for responses for married respondents were maintained because if they rated that the items would be much worse if they were not married to the baby's father/mother, it shows they are more satisfied with their partner and/or relationship. A total relationship status satisfaction score was created by summing the responses. Higher scores indicate more satisfaction with their partner and/or relationship (α =0.72 mothers and 0.67 fathers; range 6-30).

If you were/were not married, how would life be different in terms of:

1. *financial security*
2. *overall happiness,*
3. *freedom to do what you want*
4. *control over money*
5. *sex life*
6. *relations with parents*

No Fragile Families analyses to my knowledge have used these questions as a summary measure representing relationship quality. Therefore, this dissertation is a novel use of these questions as a representation of relationship quality.

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Chapter III. Parental Stress during Pregnancy and Birth Outcomes among Children in the Parenting and Relationship Transition and Risk Study

a. Introduction

Preterm birth (PTB; <37 weeks gestation) and low birth weight (LBW; <2,500 grams) are leading causes of infant mortality in the United States (U.S.)[1] and infants born pre-term and/or with a LBW are at increased risk for negative health and developmental issues as they grow.[2,3] Of all infants born in the U.S., 11.3% are born pre-term and 8.0% are born with a low birth weight.[4] Among teens aged 15-19, the rates of PTB and LBW are even higher at 13.960% and 9.31% respectively.[4] Among babies born to 15 year olds, 17.35% are born preterm and 10.23% have a low birth weight.[4] The higher rates of these adverse birth outcomes among teens has been attributed to maternal risk factors associated with teenage pregnancy, such as low socioeconomic status, minority status, and inadequate prenatal care.[5,6] A study by Chen et. Al. (2007),A cohort? study of xx pregnant women comparing teens to adults?, however, found that teen pregnancy increases the risk for adverse birth outcomes even after adjusting for these factors independent of these confounders,[7] suggesting that other factors are also at play.

Stress as a predictor of birth outcomes

Epidemiological evidence shows that maternal stress during pregnancy is consistently predictive of negative birth outcomes, including PTB[8–12] and LBW.[8,10,13,14] In fact, the American Congress of Obstetricians and Gynecologists recommends screening for psychosocial stress as part of prenatal care, citing that it may play a role in PTB and LBW.[15] Adolescents and young adults experience stressors that emanate from various life domains, including close relationships and personal hardships, but for adolescents and young adults who are racial and/or ethnic minorities and from a low socioeconomic status (SES), daily stressors often extend beyond these typical developmental challenges. This population is disproportionately affected by other chronic stressors, such as neighborhood problems, racism and discrimination. Given thisThus, stress may have a substantial effect on birth outcomes among this more vulnerable populationlow SES youth of color.

Commented [JD1]: More specific? "problems" is a bit vague given the large neighborhood literature.

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Conceptually, stress is an interactive process in which environmental demands exceed one's adaptive capacity, resulting in three types of responses that can lead to poor health outcomes and, therefore, serve as mediators between experiences of stress and adverse birth outcomes: 1) behavioral, 2) cognitive/psychological and 3) physiological responses.[16–18] ~~It is through these three inter-related stress-response processes, detailed below, that experiences~~ Experiences of stress are ~~thought~~ hypothesized to affect birth outcomes through these three inter-related stress-response processes, as detailed below.[19]

First, negative health behaviors, such as smoking or substance use, can serve as coping mechanisms for stress.[17,20] Studies show that stress consistently predicts negative health behaviors (e.g. smoking, substance use, poor dietary habits, physical inactivity) among pregnant women,[18,21] which are also consistently related to adverse birth outcomes. For example, smoking and substance use are well-documented ~~predictors~~ causes of PTB,[22] and inadequate nutrition and smoking are known risk factors for LBW.[18,23]

Second, negative appraisals or perceptions of stress are thought to cause cognitive and psychological responses, which subsequently directly affect both behavioral and physiologic responses, and risk for physical and mental disease.[16] These psychological responses include depressive symptoms, which have been independently linked with negative birth outcomes.[24]

Third, two physiologic pathways through which stress and the cognitive and psychological responses may affect birth outcomes include the neuroendocrine system—specifically the hypothalamic-pituitary-axis (HPA), which regulates the physiological response—and the immune/inflammation system. Under conditions of chronic psychological stress, the HPA axis can become dysregulated, leading to chronically elevated levels of glucocorticoids in the system,[9] which could signal a series of endocrine events leading to PTB.[9] Stress may cause preterm birth through the immune/inflammation pathway by increasing maternal susceptibility to infection,[8] causing the release of

catecholamines[8] or causing an inflammatory response that triggers contractions, cervical ripening and membrane rupture.[25]

Dunkel Schetter and Lobel[18] offer the most comprehensive framework depicting the~~se~~ pathways through which maternal stress may influence PTB and LBW (Figure III-1). The conceptual model describes how both chronic (persistent or recurrent difficulties over the long term) and acute (discrete threats that are shorter term) stressors can influence birth weight and gestational age at delivery. Dunkel Schetter and Lobel's framework synthesizes findings from a large literature examining individual stress components and birth outcomes. Previous studies, however, have been inconsistent in terms of how stress is conceptualized, if a conceptual model is attended to at all, and none assess all components of this model, including stress exposures, appraisal, responses and birth outcomes.

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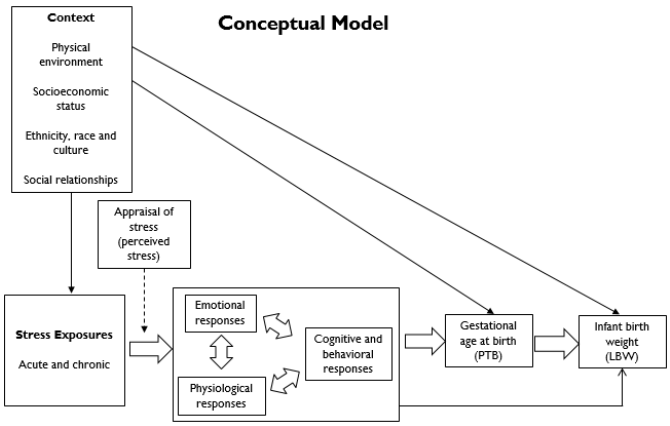

Figure III-1. Conceptual model of the pathway between maternal experiences of stress and adverse birth outcomes as proposed by Dunkel Schetter and Lobel.[18]

Sources of stress

The stressors that expectant parents experience may come from multiple sources, including individual experiences (e.g. job loss), interpersonal exposures (e.g. conflict in a steady relationship), neighborhood conditions (e.g. crime in neighborhood), ~~to~~ and societal context (e.g. racism). These stressors are more common among low income populations and racial and ethnic minorities due to social and economic structures and influences.[26] These stressors ~~are all thought to~~could influence birth outcomes through the behavioral, psychological and physiological pathways described above, and a large body of literature has examined how maternal experiences in each of these domains is associated with negative birth outcomes. For example, checklist inventories of acute major life events mothers experienced during pregnancy have been associated consistently with lower infant birth weight and gestational age at birth.[14,18] Maternal perception of neighborhood problems during pregnancy have been significantly associated with lower infant birth weight,[27] with the hypothesis that living in a disadvantaged neighborhood causes stress by increasing the likelihood of experiencing stressful life events and exposing individuals to neighborhood disorder.[28] Discrimination and racism are also thought to cause chronic stress; however, the findings on the effects of maternal experiences of discrimination on birth outcomes have been mixed. Some studies exploring whether maternal experiences of discrimination during pregnancy are associated with LBW and PTB have found a significant association (e.g. Dominguez et al.,[29] Collins et al.[30]), while others have not (e.g. Lu and Chen,[31] Shiono et al.[32]). Most studies have assessed the influence of these different sources of stressors on birth outcomes individually, despite acknowledgement that birth outcomes are the result of conjoint effects of multiple factors.[18]

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Stress among expectant adolescents and young adults

While stress ~~is a fact of life that~~ cuts across all populations, stress may have a ~~more substantial~~ larger deleterious effect on ~~certain vulnerable populations. A~~expectant adolescents and young adults ~~adults are one such population who may be especially susceptible to the ill effects of stress~~ for several reasons. First, adolescents and young adults are ~~still~~ developing and may lack effective coping skills and resources.[33] Second, pregnancy itself can be a stressor for any expectant parent,[34] but the transition to parenthood may be exceptionally stressful for adolescents because they are concurrently confronting the challenges of parenthood and adolescent development.[35] Pregnancy can also give rise to or exacerbate other stressors that may be more common among adolescents and young adults compared to older expectant parents (e.g. financial concerns for supporting a new baby, relationship problems).[36] Third, during adolescence and young adulthood, social relationships outside of the family, including romantic relationships, become increasingly important.[37] An adolescent's romantic partner plays an important role in the attachment, support, and caregiving behavioral systems.[38] Most expectant adolescents and young adults are involved with the baby's father during pregnancy;[39,40] however they are still learning to interact with their partner and developing their relationship skills[38] and therefore negotiating this relationship may be a significant source of stress for this population compared to older adults.

Paternal Influence on birth outcomes

A large body of literature has documented that women's experiences of stress during pregnancy are associated with negative birth outcomes;[8–13] however, research has also demonstrated that the perceptions of stress and coping strategies are affected by social relationships.[41] The relationship with the baby's father is often an important social relationship in an expectant woman's life, regardless of ~~whether she is married to him or not~~marital status. Over 80% of unmarried pregnant women are in a

relationship with the baby's father during pregnancy.[42] Thus, a woman's male partner likely has a substantial influence on the expectant mother during this time.

Despite the importance of male partners during pregnancy, very little research has explored paternal influences on birth outcomes.[43] Research examining the impact of stress on birth outcomes that includes paternal factors has been limited to maternal reports of paternal involvement and support, and these measures are often crude (e.g. the extent to which there is a father's name on the birth certificate).[44,45] Researchers and clinicians have almost entirely focused on how women's experiences are associated with birth outcomes; however, men's experiences of stress during his partner's pregnancy may also influence birth outcomes through his effects on maternal psychosocial factors.[46]

In fact, substantial evidence supports the theory that among couples, stress experienced by one member can ~~cross-over and~~ affect the well-being of the other member.[47] For example, a woman's partner's stress with his friends may ~~cross-over and~~ impact her own depression. [47] Much of this research has focused on the cross-over of one's work stress to the other's well-being[47] and relationship satisfaction (e.g. Neff[48]); however no studies have documented this process among expectant couples, and none have assessed the impact of paternal stress during pregnancy on birth outcomes via effects on maternal well-being.

Current study

The current study aims to, first, investigate the association between maternal and paternal stress during pregnancy and the gestational age at birth and birth weight of their baby among adolescent and young adults from low SES?. Second, this study aims to explore whether the association of maternal and paternal experiences of stress with birth outcomes is mediated by maternal depressive symptoms.

b. Methods

b.1 Data Source

Overview and Sampling Procedures

Data for this analysis come from baseline interviews of 296 expectant young couples who participated in the Parenting and Relationship Transition and Risk Study (PARTNRS) between 2007 and 2011, and birth hospitalization medical records. Women were recruited from obstetrics and gynecology clinics and an ultrasound clinic in four university-affiliated hospitals in lower Connecticut. An initial screening included only women who reported they were in a romantic relationship with the baby's father.

If the baby's father was not present at the time of screening, research staff asked for permission to contact him to explain the study. If the expectant woman was willing, research staff provided informational materials for the baby's father and asked the baby's mother to talk to him about the study. Research staff contacted the baby's father to answer any questions and, if he was interested, scheduled an appointment for the couple's baseline interview.

Participants

Inclusion criteria to participate in the baseline interview for both men and women were: (a) pregnant or partner was pregnant after 24 weeks gestation; (b) women were age 14-21 years and men were age ≥ 14; (c) both reported being in a romantic relationship with each other; (d) both reported being the biological parents of the unborn baby; (e) both agreed to participate in the study and (f) both were able to speak English and/or Spanish.

Study Procedures

A research staff member obtained Informed consent ~~was obtained by a research staff member~~ at the baseline appointment, which was conducted after 24 weeks gestation but before the baby was born. The couples separately completed a structured interview via audio computer assisted self-interviews (A-CASI) during this baseline appointment. A-CASI allows respondents to listen over headphones to spoken questions that are also displayed on the computer's screen.

After the baby's due date, a research assistant went to each affiliated hospital and collected birth outcome information from each participating woman's medical record. A small number of women did not deliver at an affiliated hospital.[1] In this case, the research assistant collected basic birth outcome information (e.g. birth weight, gestational age at delivery) directly from the baby's mother by calling her on the telephone. All procedures were approved by the Yale University Human Investigation Committee and by Institutional Review Boards (IRB) at study clinics. IRB approval to use the de-identified PARTNRS data was also obtained from the CUNY Graduate Center. Participants were paid $25 for their voluntary participation in this interview.

Commented [HJ5]: Each or was this for the couple?

b.2 Measures

Please see Appendix III-1 and Appendix III-2 for detailed item descriptions, and estimates of the validity and reliability of the measures used in the analyses for this chapter. All measures for this aim were assessed among both mothers and fathers at the baseline interview during pregnancy (after 24 weeks gestation).

Assessment of stress

[1] The number of cases where the birth outcome information was not abstracted from the mother's medical record, but rather from the mother's report is unknown due to a lack of documentation in study records; however it is estimated at less than 5%.

Table III-1 shows a detailed description of the relationship quality predictor variables. Three different stress measures were assessed via A-CASI at the baseline interview ~~(after the 24th week of pregnancy)~~ and included in this analysis. Stressful life events over the previous six months were measured using a modified 11-item version of Brugha and Cragg's Life Events Scale (LES).[49] Participants reported whether they experienced each item (yes/no), such as suffering a serious injury or assault and having money problems. Experiences of discrimination (referring to experiences "in general") were measured using Essed's Daily Life Experiences Scale.[50] Participants responded on a 6-point scale ranging from "Never" to "Once a Week Or More" for each item, such as "In general, how often are you observed or followed while in public spaces?" and "In general, how often are you ignored, overlooked, or not given service (in a restaurant, store, etc.)?" Perceived stress over the past month was measured using ten items from Cohen's Perceived Stress Scale.[83] Participants indicated how often they felt each item on a 5 point scale ranging from 0="never" to 4="very often," such as "In the past month, how often have you felt unable to cope with all of the things you had to do?" and "how often have you felt that difficulties were piling up so high that you couldn't overcome them?"

Assessment of Birth Outcomes

The baby's *birth weight* and *gestational age* at delivery were abstracted from the mother's medical record at delivery (or from the baby's mother if not available as described under *Study Procedures*). Gestational age was recorded in weeks and birth weight was recorded in grams.

Commented [HJ6]: Did you also dichotomize these?

Covariates

Several covariates were accounted for during model building and are described in detail in Appendix III-1. A priori hypothesized ~~Demographic~~ demographic confounders included maternal and

paternal household income, age, work/student status, and race/ethnicity, and maternal parity and baby's gender.

Clinical risk factors were also a priori hypothesized confounders. A summary score of five clinical risk factors /complications variable ranging from 0 to 5 was computed due to the low numbers of women with any one individual clinical risk factorsfactor. Women were given a value of 0=NNo and 1=yes for each of the five clinical risk factors: obese before pregnancy (based on calculated BMI >30 calculated from self-report of pre-pregnancy weight and height); a positive Chlamydia and/or Gonorrhea test at any point? during pregnancy (LCR test during study participation),); medical record indication of pre-eclampsia,; medical record indication of gestational diabetes,; and self-report on whether she received no any prenatal care prior to by the time of the interview, which is within the third trimester (self-report). (Might think about some other ways to code these, such as individual dummies—they don't seem to relate to one another in a way that is amenable to summing up.)

Mediator

Depressive symptoms over the past week were measured using 15 of the 20 items in the Center of Epidemiological Studies-Depression Scale (CES-D).[51] Participants responded on a 4-item scale ranging from 0="Less than 1 day" to 3="5-7days". Items included "during the past week I had crying spells" and "during the past week I felt depressed."

Commented [HJ7]: Was this only during study participation so the test was given at the third trimester visit?

Formatted: Font: Not Italic

Commented [HJ8]: How did you use the score – did you dichotomize to create 'depressed' vs. 'not depressed'?

Table III-1. Stress predictor and mediator variables

Construct	Measure	Description	Response Scale	Scoring
Stressful Life Events	Brugha and Cragg Life Events Scale (LES)[49] (adapted)	11 items assessing experiences of stress (e.g. having an illness, death in the family)	1=Yes, 0=No	-Responses summed to form an index -Higher scores correspond to more events (range: 0-11) (α = 0.65 w, 0.72 m)
Discrimination	Essed Daily Life Experiences Scale[50] (adapted)	20-items assessing experiences of discrimination (e.g. not being given service in store, being called insulting name).	6-point scale ranging from 0 ("Never") to 5 ("Once a Week or More")	-Responses summed to form a continuous scale -Higher scores correspond to more discrimination (range: 0-100) (α = 0.92 w, 0.94 m)
Perceived Stress	Cohen Perceived Stress Scale[52]	10 items assessed degree situations are stressful (e.g. how often nervous or stressed; unable to control important things)	5-point scale ranging from 0 ("Never") to 4 ("Very often")	-Responses summed to form a continuous scale -Higher scores correspond to more perceived stress (range: 0-40) (α = 0.77w, α = 0.74 m)
Depressive Symptoms	Center of Epidemiological Studies-Depression Scale (CES-D).[51] (adapted)	15 items assessed how often experienced the depressive feeling or thought (e.g. I felt depressed, had crying spells) -Five behavioral manifestations of depression items were removed	4-point scale ranging from 0 ("Rarely or none of the time (less than 1 day") to 3 ("Most of the time (5-7 days)")	-Responses summed to form a continuous scale -Higher scores correspond to more depressive symptoms (range: 0-45) (α = 0.84, α = 0.78 m)

b.3 Statistical Analysis

I generated ~~Descriptive~~ descriptive statistics to describe sample characteristics ~~were generated~~ using IBM SPSS Statistics (SPSS Corporation, City, State) ~~V22 to assess the characteristics of the sample population~~. I used IBM SPSS AMOS V22 ~~software was used~~ to construct ~~the~~ a latent stress ~~variable~~ measure from the four stress measures. I then used structural equation modeling (SEM) ~~,~~ to ~~determine~~ test the extent to which ~~ability of~~ the maternal and paternal latent stress variables ~~to~~ predicted gestational age at birth and birth weight after adjusting for a priori hypothesized confounders. I further ~~,~~ examined whether maternal depression explained any of the association between the latent stress variables and birth outcomes to test for it as a mediator. ~~Structural equation modeling (~~SEM~~)~~ simultaneously assesses direct, indirect and total effects of a system of variables on an outcome. ~~, i~~It can be tailored to account for clustering of data within couples, ~~it~~ can accommodate multiple correlated outcomes (such as birth weight and gestational age in this study) and ~~it~~ can ~~handle~~ include latent variables.[53,54] Therefore, SEM was ideal for use in this study.

Commented [HJ9]: Above it says three stress measures.

~~*Data Preparation*~~*Sample*

Of the 296 participants, seven men had substantial missing data (i.e. had at least one stress measure missing). Maternal and paternal demographic characteristics did not differ significantly among the men with missing data on the stress variables compared to those who were not missing data (not shown). Therefore, couples with men missing stress data were excluded. Fifteen additional couples were missing data for birth weight and gestational age at delivery and ~~, A~~another three ~~couples~~ were missing data on birth weight ~~only~~. Maternal and paternal demographic characteristics did not differ significantly between the couples missing ~~when the~~ birth outcomes data and those with this data (not shown) ~~were and were not available~~. ~~Therefore, t~~These 18 couples were also excluded. The final sample size was 272 couples who gave birth to 272 infants? Were there any twins?.

One birth weight outlier was identified using the Outlier Labeling Rule as described by Hoagline, Iglewicz and Tukey.[55] The value for this case (915 grams) was Windsorized to the next lowest value (1390 grams).[56] Five gestational age outliers were identified using the Outlier Labeling Rule. The values for these cases (27.14-34.00 weeks) were Windsorized to the next lowest value (34.57 weeks), respectively.[56]

Commented [JD10]: Not sure I understand this—these are not unfeasible gestational ages, correct?

Model Specification and Identification

I calculated Cronbach's alphas f~~F~~or discrimination, perceived stress and depression scales~~all stress measures (except stressful life events) and the depressive symptoms variable, coefficient alphas were calculated~~ to estimate the reliability of these scales~~ensure that they behave consistently with the expected psychometric properties~~ (Table III-1, column 5). Alpha values were ~~very good for all stress variables~~high (ranging from xx to xx). I did not calculate a Cronbach's ~~The~~ alpha ~~was not calculated~~ for the stressful life events measure because, as an index, a participant's endorsement of one item should not necessarily be related to the endorsement of another item if the events are independent.[57]

Because participants were part of couples (i.e. dyads) clustering effects were likely. I estimated Spearman's rank correlation coefficient (rho) ~~were evaluated~~ to determine the collinearity of dyad members' data (Table III-2). In the ~~measurement~~ SEM? model, covariances were drawn between the error terms of the maternal and paternal stress variables to account for clustering.

Commented [HJ11]: I would avoid the passive voice and use I did x, y and z.

Table III-2. Correlations between maternal and paternal stress predictor variables

Spearman's Rho				
		Men		
		Stressful life events	General discrimination	Perceived Stress
Women	Stressful life events	.22**	.06	.11
	General discrimination	.10	.14*	.13*
	Perceived Stress	.11	.03	.29**

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Estimation

The model was estimated using maximum likelihood, which compared the likelihood of the given model to the likelihood of a model with perfect fit. This method was preferred because it is asymptotically unbiased and is scale invariant.[58] Unstandardized coefficients were calculated to allow for comparison of coefficients between mothers and fathers.[59]

Testing

Global fit indices recommended by Bollen and Long (1993),[60] and Blunch (2008)[54] were assessed. The overall chi squared test of model fit was calculated; however, because this fit index is sensitive to sample size, the Tucker Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and the p value of close fit (PCLOSE) were also calculated.[54]

c. Results

c.1 Sample Description

The sample is described in detail in Table III-3. On average, the women in this study were 18.7±SD years old and their male partners were 21.3±SD, average age difference was xx±SD. Most of the participants were black (xx%) or Hispanic (xx%). Just over half of the women were in school or working, while nearly three-quarters of the men were in school or working. The average annual household income of women and men was quite low ($13,567 and $17,518, respectively). The average birth weight of the baby was 3,210.65±SD grams and the average gestational age at delivery was 39.22±SD weeks.

Commented [HJ12]: I would say what proportion of babies were considered LBW and what proportion were PTB as well. I think it would also help to describe how much variability there is in your stress and depression measures here

Table III-3. Characteristics of Sample Population (N=272)

	MOTHERS			FATHERS		
	N	**Mean**	**SD**	**N**	**Mean**	**SD**
Birth Weight (g) of baby	272	3210.65	538.26			
Gestational Age at delivery (weeks) of baby	272	39.22	1.86			
Age	272	18.70	1.62	272	21.33	3.98
Household Income (1,000K)	270[b]	13.57	15.55	272	17.52	21.97
BMI before pregnancy	272	25.96	6.82	268	25.06	5.50
Health care utilization total	271[2]	2.50	4.66	272	1.55	3.68
Gestational age at first interview	272	28.92	5.24	272	28.91	5.25
	N	**%**		**N**	**%**	
Current pregnancy is ~~First~~ first c~~C~~hild?	215	79.30		205	75.40	
In school or working (FT or PT)	159	58.46		199	73.16	
Race/Ethnicity						
Black	105	38.60		128	47.06	
Hispanic	110	40.44		103	37.87	
White	46	16.91		29	10.66	
Other	11	4.04		12	4.41	
Marital Status/Living Situation						
Single	107	39.34		82	30.15	
Not Married, Living with Partner	127	46.69		132	48.53	
Married	38	13.97		52	19.12	
Separated/Divorced	0	0.00		2	0.74	
Widowed	0	0.00		4	1.47	
Cigarettes during pregnancy	42	15.44				
Alcohol during pregnancy	13	4.78				
Any Prenatal care to date	259	95.22				
Pre-Eclampsia	2	0.74				
Gestational Diabetes	3	1.10				
STI during pregnancy	13	4.78				
Baby Boy	141	51.84				

[b]Data is missing for respondents who refused to answer these questions.

Commented [HJ13]: IT would help to know how much stress there was in this table – so include some information on your three stress measures as well as depression measures.

Commented [JD14]: Yes, the distribution of stress variables is very important to know.

Commented [HJ15]: Not sure what this is?

Commented [HJ16]: Not separated out – school vs. working?

Commented [HJ17]: This is confusing – how are they single if they are in a couple? Also shouldn't the married and living with partner match between the males and the females?

Commented [HJ18]: Neither cigarette use or alcohol use were mentioned above.

Commented [HJ19]: I would add proportion obese down here and then give the mean and SD of the clinical risk factors to match the text.

Commented [HJ20]: I would move this above to be with the baby characteristics – agan are all of them singleton births?

Table III-4. Correlations of Study Variables among Women

	Variable Name (Women)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	**Birth Weight** (g)	--																				
2	**Gestational Age at delivery** (wks)	.46**	--																			
3	**Stressful Life Events**	-.09	.02	--																		
4	**General Discrimination**	-.05	-.01	.46**	--																	
5	**Perceived Stress**	-.06	-.05	.25**	.38**	--																
6	**Depressive Symptoms**	-.15*	-.06	.19**	.27**	.69**	--															
7	**Age**	-.04	-.07	-.12*	-.10	-.11	-.15*	--														
8	**Household Income**	.13*	.10	.01	.06	-.01	-.14*	.18**	--													
9	**Parity**	-.04	-.09	-.02	-.15*	-.03	-.07	.31**	.01	--												
10	**BMI before pregnancy**	.12*	-.05	.05	.06	.00	.03	.03	.05	.06	--											
11	**Health care utilization total**	-.06	-.11	.21**	.16**	.12	.08	-.07	-.04	-.04	.02	--										
12	~~**Obstetrical**~~ **Clinical Risk Score**	.06	-.04	.05	.02	.02	.04	.10	-.04	.05	.54**	.01	--									
13	**In school or working** (FT or PT)	.03	.02	.01	.05	.12*	.07	-.21**	.09	-.15*	.02	.00	.03	--								
14	**Black**	-.11	-.03	-.03	-.08	.01	.06	.04	-.05	.05	.00	-.11	-.07	.02	--							
15	**Hispanic**	.08	.02	-.05	-.11	-.03	-.01	-.12*	-.05	-.01	.03	.03	.04	.09	-.65**	--						
16	**White**	.07	.00	.09	.14*	.00	-.08	.11	.12*	-.02	-.01	.08	.05	-.16**	-.36**	-.37	--					
17	**Single, Not Living w/ Partner**	-.08	.00	.03	-.01	.02	.14*	-.04	-.02	-.09	.03	.08	-.05	.14*	.10	-.03	-.06	--				
18	**Not Married, Living w/ Part**	.08	.07	.01	.01	-.02	-.10	.08	.01	.08	-.06	-.10	.00	-.06	-.06	.01	.05	-.75**	--			
19	**Married**	-.01	-.10	-.05	-.01	.00	-.05	-.06	.02	.01	.05	.03	.08	-.11	-.06	.04	.02	-.33**	-.38**	--		
20	**Cigarettes during pregnancy**	-.12*	.05	.05	.05	-.01	-.03	.10	-.05	.09	-.14*	.04	-.09	-.11	.02	-.25**	.19**	-.03	.01	.03	--	
21	**Alcohol during pregnancy**	.07	.08	.05	.04	.06	.05	.05	.12	-.11	.03	.00	-.04	-.20**	-.04	-.01	-.01	-.07	.03	.06	.10	--
22	**Baby Boy**	.17**	.09	-.06	-.08	-.09	-.13*	-.05	.01	-.04	.04	.01	.01	-.13*	-.02	.04	.00	-.07	.06	.01	-.06	.01

*P<0.05? **P<.01

Commented [HJ21]: I would make the ordering of these variables follow some logic

Table III-5. Correlations of Study Variables among Men

	Variable Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	**Birth Weight** (g)	--																			
2	**Gestational Age at delivery** (wks)	.46**	--																		
3	**Stressful Life Events**	.01	.04	--																	
4	**General Discrimination**	.13*	.08	.34**	--																
5	**Perceived Stress**	.03	.00	.24**	.33**	--															
6	**Depressive Symptoms**	.00	-.02	.08	.17**	.61**	--														
7	**Age**	-.05	-.05	.05	.02	.13*	.07	--													
8	**Household Income**	.03	.01	-.13*	-.04	-.20**	-.20**	.11	--												
9	**Parity**	-.03	.06	.03	.05	.14*	.19**	.27**	-.16**	--											
10	**BMI before pregnancy**	.10	.01	-.06	.08	.04	-.01	.20**	.03	.05	--										
11	**Health care utilization total**	-.03	-.05	.18**	.12*	.15*	.10	.02	-.12	.11	.05	--									
12	**In school or working** (FT or PT)	.01	-.07	-.16**	.00	-.16**	-.12	-.04	.31**	-.18**	.02	-.05	--								
13	**Black**	-.11	-.01	.12	.07	.00	-.03	.06	-.06	.14*	-.11	-.02	-.13*	--							
14	**Hispanic**	.01	-.06	-.17**	-.14*	.01	.04	-.10	-.05	-.10	.12	-.01	.06	-.74**	--						
15	**White**	.18**	.09	.09	.08	-.03	-.02	.13*	.19**	-.05	.02	-.01	.07	-.33**	-.27**	--					
16	**Single, Not Living with Partner**	-.11	.03	-.05	-.06	.01	.00	.05	.00	.03	-.11	-.01	-.03	.167**	-.11	-.02	--				
17	**Not Married, Living with Part**	.07	.07	.04	.11	.03	.00	.00	-.04	-.03	.08	.00	.01	-.08	.06	.00	-.65**	--			
18	**Married**	.07	-.10	.04	-.03	-.05	-.02	-.01	.08	.01	.05	-.03	.04	-.10	.06	.04	-.33**	-.47**	--		
19	**Cigarettes during pregnancy**	.08	.06	.24**	.19**	.08	.06	.16**	-.11	.23**	.03	.17**	-.20**	.11	-.16**	.01	-.01	.00	.04	--	
20	**Alcohol during pregnancy**	.06	.06	.25**	.31**	.16**	-.03	.20**	.08	.07	.06	.07	-.03	.11	-.10	.01	.04	.01	-.01	.37**	--
21	**Baby Boy**	.17**	.09	.09	-.01	-.09	-.10	.01	.09	-.09	.01	-.02	-.14*	.04	-.07	.02	.02	-.09	.09	-.03	.04

*P<0.5 **P<.01

c.2 Latent Variable Model Building

The first step in the analysis was to evaluate whether the three measures of stress (stressful life events, general discrimination and perceived stress) could be represented by a single, higher-order latent factor called maternal and paternal "stress." Separate stress latent factors were created for men and women. Based on the significant correlations between maternal and paternal measures of stress (Table III-2), I allowed correlations between the maternal and paternal residuals for each measure as well as correlations between maternal and paternal latent "stress" factors.

All path coefficients between the stress measures and the stress factor were statistically significant and greater than 0.39 (p's < .05) (Table III-6). The model of the higher-order latent stress factors exhibited good fit (X^2 =11.25, df =5, p= 0.05; TLI= 0.91; RMSEA= 0.07 (0.01-0.12); PCLOSE= 0.24).

Table III-6. Factor loadings onto women's and men's stress latent variables.

Women's Stress Latent	Estimate
General Discrimination	.91
Stressful Life Events	.52
Perceived Stress	.39
Men's Stress Latent	
General Discrimination	.67
Stressful Life Events	.51
Perceived Stress	.79

Factor Structure Invariance by gender and race/ethnicity

I tested the possibility that the way the stress measures load onto the stress latent factors could differ between men and women. The model fit did not differ significantly when constraining the loadings of each measure on to the latent stress constructs to be equal for men and women compared to a model when the measure loadings were allowed to vary by gender (X^2_{diff}=0.80, df =2, p=0.67).[59]

Therefore, I concluded that the measures of stress loaded similarly ~~on to~~for the maternal and paternal stress latent factors.

I also tested the possibility that the factor structure differed by race/ethnicity. Because the "white" group was small, I compared the factor structures of blacks versus Hispanics. The model fit did not differ significantly when constraining the latent factors to be equal (X^2_{diff}=6.45, df =9, p=0.70).[61] Therefore, I concluded that there was configural invariance by race/ethnicity.

c.3 Influence of the latent stress factors on birth weight and gestational age

Next, I created a model to examine the influence of the maternal and paternal latent stress factors on birth weight and gestational age. The model exhibited good fit (X^2 =15.87, df = 13, p=.26; TLI= 0.98; RMSEA= 0.03 (0.00-0.07); PCLOSE= 0.76). The path from paternal stress to gestational age was significant (B=0.30, P=.03) and the path from paternal stress to birth weight was marginally significant (B=75.07, P=.06). The paths from maternal stress to gestational age (B=0.01, P=.95) and birth weight (B=-31.96, P=.38) were not significant.

Commented [HJ22]: I would specify the direction of the association not just the statistical signficance

Commented [HJ23]: The direction here makes sense though

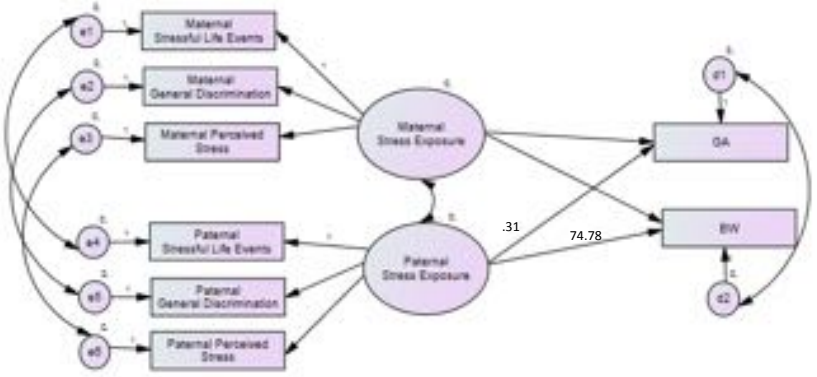

Figure III-2. Structural equation model examining the impact of the latent maternal and paternal stress factors on birth weight and gestational age at delivery accounting for all covariates. All path coefficients displayed are statistically significant (P<.05).

Commented [JD24]: It would be helpful to see all of the coefficients, perhaps bolding the significant ones?

A model adding in all maternal and paternal covariates also exhibited good fit (X^2 =197.93, df=110, p<.001; TLI= 0.88; RMSEA= 0.05 (0.04-0.07); PCLOSE= 0.27). The path from paternal stress to gestational age remained significant (B=0.31, P=.03) and the path from paternal stress to birth weight remained marginally significant (B=74.78, P=.05). The paths from maternal stress to gestational age (B=-0.02, P=.87) and birth weight (B=-44.03, P=.20) remained not significant.

To quantify the impact of paternal stress on gestational age, I used regression imputation to create values for the latent variable of paternal stress.[61] Fathers with the highest level of stress (splitting the imputed paternal stress variable at the median) had babies that were born less than one day later (M=39.49, SD=1.29) compared to babies born to fathers with low levels of stress (M=38.97, SD=1.29, t=-2.42, P=.02). Fathers with the highest level of stress also had babies that were 113.42 grams heavier (M=3,269.10, SD=476.81) compared to babies born to fathers with low levels of stress (M=3,155.68, SD=577.31, t=-1.77, P=.08), although the difference was only marginally significant.

c.4 Mediation by depressive symptoms

Next, I examined mediation of the effect of paternal stress on birth outcomes by maternal and paternal depressive symptoms by entering maternal and paternal depressive symptoms variables into the model that also accounted for all covariates (Figure III-3). The model fit was acceptable (X^2 =304.18, df = 151, p<.001; TLI= 0.85; RMSEA= 0.06 (0.05-0.07); PCLOSE= 0.03). To examine mediation by depressive symptoms, I first explored whether paternal stress was associated with his own and his partner's depressive symptoms. Greater paternal stress was only associated with his own depressive symptoms (B=6.22, P<.001). Second, I examined whether paternal depressive symptoms were associated with either birth outcome. Paternal depressive symptoms were not significantly associated

Commented [HJ25]: I would describe what you adjusted for again here.

Commented [HJ26]: But the betas are in the opposite direction right – gestational age and birth weight increased as paternal stress increased?

Commented [HJ27]: But the direction here is what you would expect, right?

Commented [JD28]: Later?

with gestational age (B=-.03, P=.37) nor birth weight (B=-4.38, P=.60). The direct associations between paternal stress and gestational age (B=.46, P=.14) and birth weight (B=133.97, P=.13) were insignificant.

Commented [HJ29]: I don't understand this last sentence – I thought the direct effects were significant as described above?

Commented [HJ30]: Interesting findings - again will help to know how much variability there was in stress and depression to put this in context – was stress generally high among everyone for example?

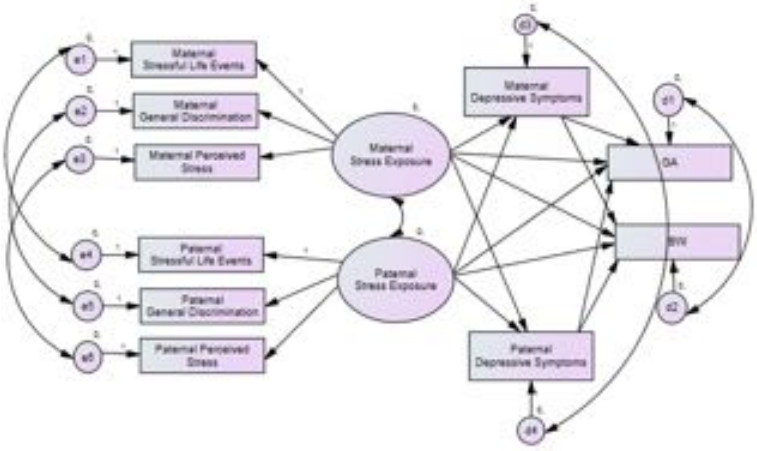

Figure III-3. Structural equation model examining mediation of the association between latent paternal stress factors on birth weight and gestational age at delivery by maternal and paternal depressive symptoms. All path coefficients displayed are statistically significant (P<.05).

d. Discussion

Contrary to many published studies, this analysis did not find a significant association between young expectant mother's stress during pregnancy and the gestational age at birth and birth weight of her baby.[8–13] This analysis did find, however, that paternal stress during pregnancy was significantly *positively* associated with gestational age at birth—a finding that was contrary to my hypothesis that paternal stress would be negatively associated with the birth outcomes. While the results were in the opposite of the expected direction, they suggest that paternal experiences during his partner's pregnancy are associated with his baby's birth outcomes and his experiences should not be ignored. In addition, the associations between paternal stress and the birth outcomes persisted after controlling for several important confounders, including obstetric risk and demographic characteristics.

Commented [HJ31]: [redacted] while not significant the estimate of the direction of maternal stress is as hypothesized – again I am wondering about power depending on how much variability there was in maternal stress levels.

Lack of effect of maternal stress on birth outcomes

The lack of effect of women's stress on birth outcomes was contrary to much of the published evidence showing a significant negative effect of stress on birth outcomes.[8–13] The women in this study generally had low incomes ($13,500 household income) and were rather young to be having a baby (in American society). These young women were likely all under a high amount of stress as they grappled with potential relationship issues and financial challenges, while concurrently traversing the road to parenthood and adulthood. It is possible that all of the expectant women were under a high amount of stress and that there was not enough variability in the stress measure to identify an association with the birth outcomes.

Commented [HJ32]: Aha – exactly – so it would help if you show us how much variability there was in the scales earlier.

In addition, the stress assessments used in this study did not include items that were specific to the stressors of pregnancy, which research has suggested may be a stronger predictor of birth outcomes among expectant mothers compared to general life event stress and perceived stress.[62] This may be an additional reason that I did not see an effect of maternal stress on birth outcomes. Pregnant women

(and their partners) may experience life events and worries that are specific to being pregnant, such as concerns about financially supporting a baby or worries about the health and development of their baby. Not including these relevant stressors may have led to inaccurate estimates of the level of stress and its impact on birth outcomes in this study.[63]

Positive effect of men's stress on birth outcomes

The lack of effect of maternal stress on birth outcomes coupled with the *positive* effect of paternal stress on birth outcomes suggests that there may be an alternative model for the stress processes among couples and how these processes influence birth outcomes. My original hypothesis was based on the traditional theory of human stress characterized mainly by the fight-or-flight response, in which a stressor activates the HPA and the immune/inflammation pathways within an expectant mother, which could affect fetal growth and initiate premature birth.[8,9] This theory assumes that the physiological and behavioral cascade of events that follows a stress exposure is the same for men and women. However, as the "tend and befriend" model of female stress response proposes, maternal responses to stress may not be best characterized solely by the fight-or-flight response.[64,65]

The "tend and befriend" model suggests that under conditions of stress, women are more likely than men to affiliate with others and seek social support than men.[64–66] In contrast, men are more likely to display behaviors that are fight-or-flight related under conditions of stress, such as aggressive behavior and substance use. These gender differences in behavioral stress responses are thought to be informed by the human attachment system, which is activated particularly in times of stress. Research has shown that women tend to display more attachment anxiety than men, and men tend to display more attachment avoidance.[67] As such, under conditions of stress, women in this study may have sought ~~out~~ substantial support from the father of their baby. This maternal support seeking behavior may have benefitted the well-being of the expectant mother; however, this increased support seeking from the

Commented [HJ33]: I am still confused if you included cigarette and alcohol use in your model – would have been mediators I would think?

expectant mother may have caused her male partner more stress, as males are less likely to use affiliative behavior as a method to reduce stress. [64–66] Thus, the young men in this study may have provided more support to their expectant partner in this time of stress, which benefitted the expectant mother's health and well-being, and ultimately the baby's well-being, but at the cost of their own increased stress. In support of this hypothesis, I conducted a post-hoc analysis using imputed values of the stress latent variables.[61] I found that women's stress was significantly correlated with her own attachment anxiety (B=.41, P=.01),[3] and women's attachment anxiety was significantly correlated with men's stress (B=.19, P=.01). Unfortunately, the original study did not include a measure of support seeking.

The "tend and befriend" model also suggests based on studies of rodents, that the *initial* neuroendocrine response to stress may be similar among men and women—the rapid activation of the HPA and the immune/inflammation pathways—however, there may be other gender differences in the neuroendocrine response after the initial reaction. Research has shown that oxytocin release in the response to stress is greater among females than males. Oxytocin, often referred to as a "love drug" may reduce feelings of stress by countering the initial HPA and the immune/inflammation responses and enhance affiliation (i.e. support seeking) behavior.[65]

Another potential explanation for this positive effect is that the women whose partners had the most stress are less involved with their partner and more involved with their own family, who provide compensating support for the expectant mother. A post-hoc analysis using imputed values of the paternal stress latent variable[61] found that men with high levels of stress (median split) reported greater depression, lower optimism, lower life satisfaction, and more smoking, alcohol use and marijuana use. Perhaps the expectant women whose partners are highly stressed and exhibit these unhealthy behaviors rely more on their own family for support, who compensate and ultimately help support a

[3] Attachment anxiety was measured using the Experiences in Close Relationships Inventory (ECRI) by Brennan, Clark and Shaver (1998)[68]

healthy pregnancy. Post-hoc t-tests showed that women whose male partner had the highest stress were less likely to receive financial support from her male partner and more likely to receive financial support from her own parent. These women with highly stressed partners also reported lower dyadic cohesion. The men with the greatest stress also report more attachment avoidance and anxiety, which could ultimately deter a relationship from being close. In fact, the men with the highest level of stress have lower intensity of feelings for their partner.

Unfortunately, the original study that this data come from did not have a strong measure of "closeness" of the couple. A proxy for closeness of the couple may be the living arrangement of the couple—and specifically whether the expectant woman lives with her own mother or not. A post-hoc analysis found that the effect of men's stress on gestational age at birth differed significantly based on the expectant woman's living arrangements ($Z=-1.79$, $P<.05$). When the mother of the baby lived with her own mother (and not the baby's father), men's stress did not have a significant effect on gestational age ($B=-.09$, $P=.63$); however, when she lived with the baby's father (with her own mother or not), men's stress had a significant positive effect on gestational age ($B=.40$, $P=.04$).

Given that men's stress still had a positive effect on birth outcomes among the "closest" couples, the "tend and befriend" model is still consistent with these outcomes. When couples are closer, the men may be a stronger support system for the expectant mother, which could benefit her health and well-being and ultimately the health of the baby. However, this support of the expectant mother may come at the expense of higher stress for her father. While ~~the importance of~~ social support for pregnant women and new mothers is considered important~~paramount~~ in our society, we generally pay little attention to expectant and new fathers. Interventions that support not only expectant and new fathers, but also the relationship between expectant and new parents may be important to the health and well-being of the whole family system.

Commented [JD34]: So there is no causal story about the father's high stress being protective for the baby? Maybe they care more about the pregnancy?

Commented [JD35]: I'm just a bit confused on what the implications are given the findings for men in the opposite direction.

Lack of mediation by depressive symptoms

Depressive symptoms did not mediate the effect of paternal stress on birth outcomes. In this study, there was no evidence of stress and strain cross-over between members of the couple.[69] Maternal and paternal experiences of stress were not associated with their partner's depressive symptoms. This may be due to the fact that these couples are young, nearly all unmarried and 46.7% of the young mothers still live with their own mothers. Evidence has shown that the closeness of a couple may moderate the cross-over effect, with closer couples experiencing more cross-over of the effects of stress from one member to the other.[42] Many of the couples in this study may not have had close enough relationships for paternal stress to cross over and affect maternal feelings of stress and well-being. In a post-hoc moderated mediation analysis,[61] however, the effect of men's and women's stress on their partner's depressive symptoms still did not differ based on the expectant mother's living arrangement ($Z=.29$, $P>.05_{\text{men's effect on women}}$; $Z=-.40$, $P>.05_{\text{women's effect on men}}$).

Concluding remarks and future research directions

Future studies would be strengthened by the inclusion of stress appraisals and perceptions. What is stressful for one person may not be stressful for another, and therefore the likelihood of reporting a stressful event may be affected by an individual's appraisal of the stressor.[70] Measures of stress appraisals and perceptions could ascertain the individual's perception and evaluation of potential harm posed by a specific external demand (i.e. stressor) and their ability to cope with the demand.[71] The inclusion of biological indicators of stress responses may also help elucidate this gap between whether a stressor actually has a physiological effect on the expectant mother that could ultimately affect the health and development of the fetus.[14] And one needs more power to detect effects, for sure!

Despite the fact that the findings from this investigation may leave us with more questions than answers about paternal effects on birth outcomes, even including father's experiences and feelings within birth outcome research is a step in the right direction as there has been virtually no investigation

in this arena. The findings from this study suggest that there *is* a relationship between birth outcomes and men's experiences during pregnancy; however, the lack of consistency of the findings with accepted theory on how stress affects health indicates that more research is necessary. This is the first analysis to explore the effect of *paternal* stress on birth outcomes, and the pathways through which he has an effect. This analysis also assessed direct report of stress exposures and responses from the fathers, avoiding measurement error associated with using maternal reports of paternal experiences.

The analytical techniques used in this research also strengthen the analyses. The analysis accounts for the correlated nature of maternal and paternal reports, while maintaining the strength of the total sample size (i.e. without conducting the analyses separately by gender). In addition, structural equation modeling allows for the simultaneous assessment of multiple hypotheses involving complex pathways, while parceling out measurement error.

This is the first study in the literature to date that explores the role of expectant father's experiences of stress during his partner's pregnancy on his child's birth outcomes using direct report from the fathers and strong analytical techniques. The study demonstrates that paternal experiences of stress during his partner's pregnancy are significantly associated with birth outcomes, but not in the direction that is consistent with conventional theory of how stress is related to one's own and one's partner's health and well-being. This study offers a unique perspective building on the "tend and befriend" model to explain how greater paternal stress during pregnancy may be positively associated with his baby's birth outcomes. Future studies that further explore alternative models for how paternal experiences and well-being during pregnancy affect his baby's birth outcomes are warranted.

Appendix III-1. Outcome and Confounder descriptions and details

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
Birth Outcomes						
Birth Weight	Weight at birth in grams	--	--	At birth via labor log	--	Continuous
Gestational Age at Birth	Weeks pregnant at birth	--	--	At birth via labor log	--	Continuous
Mediator						
Depressive Symptoms	Center of Epidemiological Studies-Depression Scale (CES-D).[51] (adapted)	15 items assessed how often experienced the depressive feeling or thought (e.g. I felt depressed, had crying spells) -Five behavioral manifestations of depression items were removed	4-point scale ranging from 0 ("Rarely or none of the time (less than 1 day") to 3 ("Most of the time (5-7 days)")	Base (24-40 weeks pregnant)*	Past Week	-Responses summed to form a continuous scale -Higher scores correspond to more depressive symptoms (range: 0-45) (α = 0.84, α = 0.78 m)
Confounders (Maternal and Paternal)						
Age	--	Summary variable created by from birth date.	--	Baseline	Current	Continuous
Household Income	--	Asks: " What is your household income (the total income before taxes earned by all members of your household) per year)	0 $0-$4,999 1 $5,000-$9,999 2 $10,000-$14,999 3 $15,000-$19,999 4 $20,000-$24,999 5 $25,000-$34,999 6 $35,000-$49,999 7 $50,000 or more	Baseline	Current	Categorical

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
School or Work Status	--	A summary measure created to indicate if the participant is either in school and/or working at least part-time.	1=Yes 0=No	Baseline	Current	Dichotomous
Race/Ethnicity	--	Variable constructed from two questions, the first asking their race (select all) and the second asking if they are Hispanic or Latino. Coded as black if selected black (regardless of ethnicity), Hispanic if selected Hispanic or Latino (regardless of race), white if they selected white only. All other participants were grouped into the "Other" category due to low sample size.	1= White 2= Black 3= Hispanic 4= Other	Baseline	Current	Categorical
Confounders (Maternal Only)						
Parity	--	Question in baseline interview	--	Baseline	Current	Continuous
Clinical Risk	--	Variable constructed from 5 yes/no items: Presence of gestational diabetes and pre-eclampsia as indicated on the labor log, having a pre-pregnancy BMI classified as obese based on height and weight questions from baseline interview, reporting no prenatal care by the time of the baseline interview and a positive urine test for chlamydia and/or Gonorrhea at the baseline interview.		Baseline and at birth via labor log	During Pregnancy	Continuous (range 0-5)

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
BMI pre-pregnancy	--	Calculated from participant report of pre-pregnancy weight and current height.	--	Baseline	Pre-Pregnancy	Continuous
Baby's Gender	--	--	1=Male 2=Female	At birth via labor log	--	Dichotomous

Appendix III-2. Variable details, items, validity and reliability

Stressful Life Events

This 11-item scale was adopted from the 12-item Life Events Scale, which was created by Brugha and Cragg (1990).[49] This scale asks participants if they have had stressful life events. 10-items out of the original 12-items were incorporated into the questionnaire, however, three original items were revised: "You became unemployed or you were seeking work unsuccessfully for more than one month" was changed to "In the past 6 months, did you become unemployed or were seeking work unsuccessfully," "You had a major financial crisis" was changed to simply "In the past 6 months, did you have money problems," and "You had problems with the police and a court appearance" was changed to "In the past 6 months, did you have problems with the police." Additionally, two questions were combined and changed into one question: "Your parent, child or spouse died" and "A close family friend or another relative (aunt, cousin, grandparent) died" were combined and shortened into "In the past 6 months, did a close family member or friend die."

Additionally 2-items were added for the research study including: "In the past 6 months, did you have problems at work or school," and "In the past 6 months have you moved." Two of the original items from the LEQ were also omitted from the research study including: "You had a separation due to marital difficulties" and "You were sacked from your job."

The 11 items were summed to form a total score.

The test-retest reliability of the Life Events Scale is reported as .84 for a three-month period and .66 for a six-month period. Data on internal consistency are not available. Concurrent validity estimates were derived from the concordance between inpatient psychotic patients' identification of stressful events and those identified by a significant other; there was a 90% agreement when assessed at a three-month period and a 70% agreement when assessed at six months. The authors also used an extensive interview of stressful events as a base rate and showed that the LEQ was sensitive to the identification of stressful events.[49]

Items:

In the past 6 months:

have you suffered a serious illness, injury, or assault?
did a close relative suffered a serious illness, injury, or assault?
did a close family member or friend die?
you break off a steady relationship?
did you have a serious problem with a close friend, neighbor, or relative?
did you become unemployed or were seeking work unsuccessfully?
did you have money problems?
did you have problems with the police?
did you have problems at work or school?
was something you valued was lost or stolen?
have you moved?

General Discrimination

An adapted version of the Daily Life Experiences Scale was used to assess participant experiences of discrimination.[50] The original Daily Life Experiences Scale has 20-items, however the adapted version used 19 of those items. The items how often the survey taker has experienced discrimination (e.g. Being observed or followed in public places). The response scale ranged from 0 to 5: 0= "never," 1= "less than once a year," 2= "a few times a year," 3= "about once a month," 4= "a few times a month," and 5 = "once a week or more." Responses to items were summed to form a total score ranging from 0-95.

Four items from the original scale were also revised, including "Being mistaken for someone else of your same race (who may not look like you at all)" was changed to "mistaken for someone else (who may not look like you at all)" and "Being asked to speak for or represent your entire racial/ethnic group (e.g. What do ___people think?)" was changed to "asked to speak for or represent an entire group (e.g. What do ___people think?), "Overhearing or being told an offensive joke or comment" was changed to "hear an offensive joke or comment" and "Being avoided, others moving away from you physically" was changed to "avoided, or do others move away from you physically." There was also one item added: "Someone in the health system showed you hostility or a lack of respect, refused you service or paid less attention to you compared with others" and one item was omitted "Being considered fascinating or exotic by others."

Items

In general, how often are you ignored, overlooked, or not given service (in a restaurant, store, etc.)?
In general, how often are you treated rudely or disrespectfully?
In general, how often are you accused of something or treated suspiciously?
In general, how often are you do others react to you as if they were afraid or intimidated?
In general, how often are you observed or followed while in public places?
In general, how often are you treated as if you were "stupid", being "talked down to"?
In general, how often are your ideas or opinions minimized, ignored, or devalued?
In general, how often do you hear an offensive joke or comment?
In general, how often are you insulted, called a name, or harassed?
In general, how often do others expect your work to be inferior?
In general, how often are you not taken seriously?
In general, how often are you left out of conversations or activities?
In general, how often are you treated in an "overly" friendly or superficial way?
In general, how often are you avoided, or do others move away from you physically?
In general, how often are you mistaken for someone who serves others (i.e., janitor, bed boy, maid)?
In general, how often are you stared at by strangers?
In general, how often are you laughed at, made fun of, or taunted?
In general, how often are mistaken for someone else (who may not look like you at all)?
In general, how often are you asked to speak for or represent an entire group (e.g., "What do _____ people think?")?
In general, how often has someone in the health system showed you hostility or a lack of respect, refused you service or paid less attention to you compared with others?

Perceived Stress

This 10-item Perceived Stress Scale (PSS) assessed the degree to which individuals perceive situations in their lives to be stressful.[72] The items focused on how unpredictable, uncontrollable, and overloaded individuals perceive their lives to be. The participant was asked to rate the perceived level of stress in their life during the past month (e.g., "How often have you felt: upset by something that happened unexpectedly, able to control irritations in your way, and on top of things"). Possible responses ranged from 0 to 4, with 0 = "never," 1 = "almost never," 2 = "sometimes," 3 = "fairly often," to 4 = "very often." Positive items were reverse-scored. Items were summed to form a total score ranging from 0 to 40, with higher scores corresponding to greater perceived stress.

Early studies found that the 14-item measure has good psychometric properties. For example, Cohen and colleagues (1983) reported coefficient alpha reliabilities of .84, .85, and .86 across two samples of college students and a community smoking cessation group.

Early studies also found that the PSS was moderately related to responses on other measures of appraised stress, as well as to measures of potential sources of stress as assessed by event frequency. Studies also found that the PSS provided better predictions for individual behavior than did life-event scales of psychological symptoms, physical symptoms, and utilization of health services. Because levels of perceived stress should be influenced by daily hassles, the predictive validity of the PSS is expected to fall off rapidly after four to eight weeks.[72]

Items

In the past month, how often have you felt…

Upset by something that happened unexpectedly?
Unable to control important things in your life?
Nervous and stressed?
Confident in your ability to handle your personal problems? r
That things were going your way?r
Unable to cope with all of the things you had to do?
Able to control irritations in your life? r
On top of things? r
Angry because of things that happened that you couldn't control?
That difficulties were piling up so high that you couldn't overcome them

r=reverse coded

Depressive Symptoms

Fifteen items were adapted from the 20-item Center for Epidemiologic Studies Depression Scale (CES-D), which was developed by Radloff (1977).[51] The items address whether the participant felt or exhibited the behavior of the major components of depression in the previous week (e.g. I felt that everything I did was an effort). As the original CES-D scale specified, participants were asked to respond using: 0= "rarely or none of the time (less than 1 day)," 1= "some or a little of the time (1-2 days)," 2 = "Occasionally or a moderate amount of the time (3-4 days)," and "Most or all of the time (5-7 days)." The five behavioral manifestations of depression items were removed, including item did not feel like eating, trouble keeping mind on what I was doing, everything I did was an effort, my sleep was restless, and could not get going.

The CES-D scale discriminates strongly between patient and general population groups, be sensitive to levels of severity of depressive symptomatology, and reflect improvements after psychiatric treatment. In addition, it should correlate well with other scales designed to measure depression, and be related to a felt need for psychiatric services.[51]

The CES-D scale has been found to have high internal consistency (coefficient alpha =.85 in the general population and .90 in the patient sample); studies found that both inter-item and item-scale correlation were higher in the patient sample than in the population samples. The scale also has moderate test-retest reliability (r between .45 and .70). Test-retest correlation was higher for shorter time intervals.[51]

Items

During the past week…

I was bothered by things that usually don't bother me.
I felt I could not shake off the blues even with help from my family or friends.
I felt that I was just as good as other people.r
I felt depressed.
I felt hopeful about the future. r
I thought my life had been a failure.
I felt fearful.
I was happy. r
I talked less than usual.
I felt lonely.
People were unfriendly.
I enjoyed life. r
I had crying spells.
I felt sad.
I felt that people disliked me.

r=reverse coded

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Chapter IV. Stress and Behavioral Risk among Young Expectant Couples

Abstract

Many unhealthy behaviors, such as substance use and sexual risk behavior, develop during adolescence and evidence shows that stress is a contributing factor. This association has not been established among pregnant adolescents and little attention has been paid to male partners. This study examined the association between maternal and paternal experiences of stress during pregnancy with one's own and one's partner's health behaviors among 294 young expectant couples. Multilevel modeling showed that one's own experiences of stress were associated with more unhealthy behaviors for both members of the couple?. Paternal stress was predictive of more maternal conduct problems and more? Less? protected sex, while maternal stress was predictive of less paternal substance use and more protected sex. These findings highlight the importance of social relationships and interactions ~~in predicting~~on health behaviors.

Keywords: Stress, Couples, Risky Behavior, Substance Use, Pregnancy, Adolescents

a. Introduction

Learning to cope with psychosocial stress is a fundamental component of human development. Decades of research has shown us that exposure to stressors and the ways in which adolescents manage their emotions, thoughts and behaviors influence their mental and physical health.[1,2] Much research has helped elucidate the types of stress adolescents experience and the ways in which they cope, which can include unhealthy behaviors such as substance use. There has been little investigation, however, into the basic nature of stress and coping among adolescents who are expecting a baby. This population is ~~an~~ important ~~population~~ because their responses to stress (take for example, smoking) carry implications for the unborn child. In addition, coping styles (whether healthy or unhealthy) are sensitive to situational factors and developmental changes, such as pregnancy. Thus, coping behaviors exhibited during this sensitive period of development for the fetus? may affect the child's health later in life? Or do you mean for the parent?. Pregnancy ~~is also often viewed as~~may further provide a window of opportunity for intervention—expectant parents are often motivated to change or establish healthy behaviors for the good of their child[3]—and pregnancy may be an opportune time to help couples learn to better manage stress in an effort to support their health and their relationship as parents. We need better information, however, about the nature of the stressors that *expectant* adolescents experience and their responses in order to inform ~~more~~ effective interventions.

The experience of becoming a parent is a major life transition that may elicit many new stressors not only for young women, but also for the fathers of their baby. Despite the fact that pregnant adolescent females in the United States? are usually unmarried, many still have a relationship with the baby's father during pregnancy and therefore, these young men are also experiencing the major life transition of becoming a parent. Substantial research has shown us that social support can improve coping and buffer the effect of stress on well-being, and that romantic relationships can be a significant source of this much needed social support. Studies have also shown that a romantic partner's

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experiences of stress can cross over and affect one's own well-being. [4,5] Despite the interpersonal nature of stress and coping, and the fact that romantic relationships are present and important among pregnant adolescents, few studies of adolescent experiences of stress during pregnancy include the direct report of experiences and behavioral responses of the baby's father.

This paper uses stress and coping theory, and stress and strain cross-over theory to predict that expectant adolescents' and young adults' own experiences of stress are associated with their own *and their romantic partner's* health behaviors.

Stress and coping theory

Extensive research has demonstrated a consistent association between stress and health behaviors. This research is based on the hypothesis that people use health behaviors to cope with the distress that they experience. Individuals experience stress when demands exceed the resources the individual has to deal with the demands.[6] When individuals appraise a stressor as harmful, threatening or challenging, they use coping strategies to regulate the stress they experience.[1,7] Some of the coping mechanisms are adaptive and promote health and well-being, such as *active coping* (addressing or altering a stressor through active problem solving, ~~etc.~~) and *support seeking* (obtaining emotional support from a social network). Other coping mechanisms may lead to behaviors and emotions that can lead to poor health and well-being, such as *disengagement* (avoiding, withdrawing from or denying a stressor) and *distraction* (doing things that take the mind off the stressor).[1,7,8] Negative health behaviors, including substance use, risky sex, and venting anger (which could lead to conduct problems), can serve as a way for adolescents to withdraw from or keep their mind off a stressor, reduce emotional distress or release negative feelings.[9]

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Adolescents and young adults may also use negative health behaviors to cope with new and challenging stressors because they may not have developed healthier coping strategies. Adolescent's problem solving abilities, regulation of emotions, empathy and perspective-taking ability are still evolving during this developmental period.[10] Thus, adolescents may use negative health behaviors as coping mechanisms because they have not learned to employ other more adaptive coping strategies, such as identifying and actively pursuing alternative solutions.

Additionally, there is evidence that men and women have different reactions to stress. Studies have found that men are more likely to exhibit externalizing coping behaviors, such as substance use, in response to stress, while women are more likely to exhibit internalizing behaviors or affect (e.g. depressive symptoms) in response to stress.[11,12] The "tend and befriend" model of the stress response proposes that under conditions of stress, men are more likely than women to display "fight-or-flight" related behaviors, such as substance use and aggressive behaviors. This model also suggests that stress is more likely to cause women to affiliate with others and seek social support.[13–15]

Sources of stress and evidence of the impact on adolescent and young adult health behaviors

Adolescents and young adults experience stressors that emanate from various life domains, including close relationships (e.g. a fight with a romantic partner) and general personal hardships (e.g. having something important stolen).[2,16] For adolescents and young adults who are racial and/or ethnic minorities, live in urban areas and are from a low socioeconomic status (SES), daily stressors often extend beyond these typical developmental challenges. This population is disproportionately affected by other more severe and chronic stressors, such as neighborhood problems, racism and discrimination.[17] Coping strategies that are typically viewed as the most adaptive and produce the most positive outcomes, may not be realistic or even safe for adolescents within these circumstances. For example, one study found that active coping in response to exposure to violence was associated with increased

Commented [HJ5]: only urban areas? Wouldn't this be in rural areas too?

aggression among impoverished urban adolescents.[18] In the face of chronic and severe stressors that adolescents have little control over, such ~~h~~as discrimination and neighborhood problems, avoidant coping strategies (such as substance use as a method of disengagement and distraction) that afford them some transcendence from the day to day burden of stress may actually be an adaptive response and even have some benefits.[17,18]

Substantial evidence, discussed below, has demonstrated a link between experiences of stress in each of these domains and negative health behaviors among adolescents and young adults. Neighborhood problems disproportionately affect minority and low income communities and have been consistently linked to negative health behaviors among adolescents. Neighborhood problems, such as vandalism, rundown buildings, drugs and fights in the streets, become chronic stressors that may elicit negative coping mechanisms among adolescents living in the neighborhood. [19,20] For example, Lanctot and Smith (2001) found that among adolescent girls, parent-reported neighborhood disorganization was related to the adolescent's earlier sexual activity [21]. In addition Koweleski-Jones (2000) reported that perceived neighborhood problems were related to deviant behavior [22]. Among a sample of adolescents in Los Angeles, the perception of their neighborhood as dangerous was related to more oppositional defiant disorder and conduct disorder [23].

Experiences of discrimination have also been linked to negative health behaviors among adolescents. A nationally-representative survey of African American adolescents found that 87% experienced at least one source of discrimination in the previous year [24]. Several studies among adolescents and young adults show that experiences of discrimination predict greater smoking [25], other substance use [26,27], and sexual risk behaviors [28,29].

Discrete life stressors or personal hardships, referred to as stressful life events, are also common among adolescents and young adults. These stressful life events, such as losing a job or having something stolen, have been consistently associated with smoking [27,30,31], and alcohol use [27] among

adolescents and young adults. Further, among adolescents, experiencing more stressful life events has also been associated with greater conduct problems [32] and high risk sexual behavior [33,34].

Other discrete stressors stemming from important social relationships (e.g. parents and romantic partners) can have a significant influence on adolescent and young adult behavior. During adolescence and young adulthood, social relationships within and outside of the family, including romantic relationships, are extremely important [35]. Acute social-relationship stressors, such as family conflict [34] and romantic relationship dissolution [36] have been related to more substance use among adolescents and young adults.

Stress and the effects on health behavior among pregnant adolescents and young adults

Another important factor impacting the stress experienced by adolescents and young adults is their experience of pregnancy. Ethnic and/or racial minority adolescents and young adults experience a disproportionately high pregnancy rate [37]. Pregnancy can be a stressor for an expectant parent of any age or sex [38,39]. Pregnancy involves significant emotional and physical demands. It is also a major life transition that elicits many stressors, such as concerns over finances, health, and relationships with a romantic partner and family. For adolescents and young adults, the transition to parenthood may further overload coping resources and be exceptionally stressful [40,41]. This stress may lead to engaging in poor health behaviors, even among expectant mothers who intended to abstain from substance use during pregnancy. Many studies have demonstrated that maternal stress during pregnancy is associated with poor maternal health behaviors (e.g. smoking and substance use) [42,43], although these studies have been conducted among adult women.

There is very little research exploring experiences of stress and health behaviors among expectant fathers (of any age), despite the fact that a partner's pregnancy is also a major life transition for expectant fathers who may also have concerns over many issues, including finances and

relationships. A young man's experiences during pregnancy may impact his own health and behavior, as well as his pregnant partner's behavior, carrying implications for the health and development of their child. Substantial evidence has shown that social relationships have important influences on our health and well-being [44]. A majority of expectant female adolescents and young adults are involved with the baby's father during pregnancy [45], and therefore her romantic partner likely has an important influence on her during her pregnancy [46]. Despite this fact, the paternal experience during pregnancy has largely been ignored in the literature, and when it is acknowledged, it is usually reported by the expectant mother, introducing potential measurement error.

Stress and strain cross-over: theory and evidence

While there is substantial evidence demonstrating demonstrates that experiences of stress are predictive of one's own health behaviors, there is also some evidence suggests that experiences of stress can also cross-over and affect the well-being of one's romantic partner. [4,5,47] For example, a woman's partner's experiences of stress have been associated with increases in her own depressive symptoms.[4] It is thought that stress can be transferred from one person to the next through the socio-emotional process of empathetic distress, or the "emotional involvement in the problems and distressed feelings of a relationship partner, to the point of taking on the partner's emotional distress and experiencing it as one's own." [48] While empathy for others is considered an developmentally adaptive competency[49] and is fundamental to the development of close relationships,[50] evidence has shown that there can be substantial emotional "costs of caring"[51] that can be mediated by this process of empathetic distress.[48]

This cross-over of stress has been documented among young adolescent friend pairs, with the young women reporting more empathetic distress than boysyoung men.[48] Given evidence that men and women report different patterns in internalizing and externalizing responses to stress,[11,12] it is possible

that young men may report less empathetic distress, but more externalizing coping behaviors (e.g. substance use) as a result of his partner's stressful experiences.

Current study

Many studies have shown that an adolescent's experiences of stress have a negative influence on their own health behaviors(e.g.[19–23,25,30,36]) and at least one study has shown that adolescents' experiences of stress can influence a close friend's emotional distress.[48] There is also a substantial literature focused on the transmission of job-related stress among husbands and wives.[4]

Very little attention has been paid to the consequences of experiences of stress on romantic partners—someone with whom a pregnant adolescent or young adult has an important relationship and interacts frequently. No research to our knowledge has explored paternal experiences of stress during his partner's pregnancy and the effects on his own and his pregnant partner's health behaviors. Further, no studies have explored whether experiences of stress can cross-over and affect a romantic partner's health behaviors among adolescents and young adults who are expecting a baby.

The current study aims to fill these gaps in the literature by examining how both personal and partner experiences of stress are associated with poor health behavior during pregnancy among a sample of expectant adolescent and young adult couples who are largely racial and/or ethnic minorities and have a low socioeconomic status. First, we describe expectant parents' experiences of stress during pregnancy across several domains (e.g. personal hardship, close relationship stressors, neighborhood problems and discrimination). Second, drawing from stress and coping theory, we describe the association of these experiences with ~~their poor~~negative health behaviors and mental health (substance use, unprotected sex, conduct problems and depressive symptoms). Third, we dr~~e~~aw upon stress and strain cross-over theory to explore partner effects—the association between a *partner's* experiences of stress with one's own poor health behaviors and mental health.

b. Method

Participants and Procedures

The current study is a secondary data analysis of baseline data collected between 2007 to 2011 from 296 expectant young couples (females ages 14–21 years and their male partners ages 14+ years) enrolled in a longitudinal study of relationships and health during the transition to parenthood. Detailed study procedures are published elsewhere [52] and within the previous chapter. In short, young women and men in a romantic relationship and expecting a baby were recruited from four urban university affiliated hospital-based clinics in lower Connecticut (CT) (Yale University Women's Center and ultrasound clinic, Bridgeport Hospital OB/GYN clinic, New London OB/GYN clinic, Hospital of St. Raphael OB/GYN clinic). The couples completed separate audio computer-assisted self–interviews (A-CASI), which allows participants with low literacy to complete the survey [53] and elicits more accurate and valid responses to sensitive questions.[54,55] Of the 413 eligible couples screened, 72.2% enrolled. Compared to those who refused to participate, participants were on average two weeks further along in pregnancy at screening ($P < 0.03$). Participants versus those who refused participation did not vary by any other pre-screened demographic characteristic (all $P > 0.05$).

A research assistant obtained informed consent from the couples at the baseline survey. Participation was voluntary, confidential, and did not influence the provision of health care or social services. All procedures were approved by the Yale University Human Investigation Committee and by Institutional Review Boards at study clinics. IRB approval to use the de-identified PARTNRS data was also obtained from the CUNY Graduate Center.

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Measures

Stressors

Stressful life events related to *close relationships* and *personal hardship* were evaluated by adapting the Life Events Scale [56]. Respondents indicated whether they had experienced 11 stressful life events in the previous 6 months. Four stressful life events, including broke off a steady relationship, a relative suffered a serious illness, injury or assault, a family member or close friend died and had a serious problem with a friend, neighbor, or relative, were grouped and summed as *events related to close relationships*. Seven stressful life events, including having money problems, being unemployed, moving, having something lost or stolen, problems at work or school, problems with the police, and suffered a serious illness, injury or assault, were grouped and summed as *events related to personal hardship*. Higher scores on this measure indicate the respondent experienced more stressful life events.

Respondents' perception of *neighborhood problems* was assessed using a 15-item adapted version of the Perceived Neighborhood Problems Scale [57]. Respondents indicated how much various neighborhood problems were an issue in their neighborhood, on a 3-point scale ranging from 1="not a problem" to 3="serious problem." Sample items from the original scale include "smells and fumes," "assault and muggings," and "vandalism." Two additional items were added to the original 13-item scale: "feeling unsafe after dark" and "drugs." Responses to items were summed to form a total *neighborhood problems* scale ranging from 15 to 45 (α = .95).

Perceived *general discrimination* was assessed using a 20-item adapted version of the Daily Life Experiences Scale, a subscale of the Racism and Life Experiences Scales [58]. Items concerned how often respondents experienced discriminatory treatment, such as not being given service in a store or restaurant, or being stared at by strangers. Responses were indicated on a 6-point scale ranging from 0="Never" to 5="Once a Week or More." A mean score was calculated from the 20 items to form the *general discrimination* score (α = .93).

Health Behavioral Risk

Smoking, drinking, marijuana use and hard drug use were measured using an adapted, 7-item version of the Recreational Drug Use Scale [59]. Frequency of use during the past three months for each substance (alcohol, cigarettes, marijuana, crack, heroin, methamphetamines, and "other hard drugs") was assessed using a 5-point Likert scale, ranging from 0 = "Never" to 4 = "Every Day." The adapted version included the item "other hard drugs" in lieu of the individual items in the original scale of barbituates, ectasy, gammahydroxybutyrate (GHB), hallucinogens and inhalant nitrates. We summed the report of the use of crack, heroin, methamphetamines, and "other hard drugs," to form a total *hard drug use* score (range 0 to 16) due to the low frequencies of these individual items.

Conduct problems were assessed by means of an adapted, 7-item version of the DSM Conduct Problems Scale [60]. Respondents reported the frequency of various conduct problems in the previous 6 months on a 4-point scale ranging from 1= "Not at All" to 4="5 or more times." Sample items included "skipped school or work," "got in a fight," and "stole something." Items were summed to form a total conduct problems score ranging from 7 to 28, with higher scores indicating more conduct problems.

Protected sex was assessed by asking respondents the number of times they had sex with their most recent partner in the past month and, of those, the number of times they used a condom. Percent protected sex was calculated from the ratio of number times they used condoms to number of times they had sex, with respondents not having had sex coded as 100% protected sex.

Mental Health

Depressive symptoms over the past week were measured using 15 of the 20 items in the Center of Epidemiological Studies-Depression Scale (CES-D).[61] Participants responded on a 4-item scale ranging from 0="Less than 1 day" to 3="5-7days". Items included "during the past week I had crying spells" and "during the past week I felt depressed."

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Commented [HJ10]: Was it about the partner in the couple or just whomever they last had sex with?

Analysis

I produced descriptive statistics, including frequencies and means, to describe the demographic characteristics, stressors and behavioral risk outcomes among the sample population. Two men were missing data for stressful life events and therefore I excluded two couples from the analysis resulting in a final sample of 294 couples (n = 588). I used paired t-tests and McNemar's tests to compare the demographic characteristics, stressors and behavioral risk outcomes variables between paired men and women.

Commented [HJ11]: Again using a cross-sectional approach?

I used multilevel modeling to explore the relationship between experiences of stressors and the risk outcome. Specifically, I used the Actor-Partner Interdependence Model (APIM), to account for the correlated nature of the data. This model allowed me to assess the influence of both the respondent (actor effect) and their partner (partner effect). An actor effect indicates whether a respondent's score on a predictor variable is associated with their own outcome (e.g. woman's experiences of stressors relates to her own smoking). A partner effect indicates whether a respondent's partner's score on the predictor variable is associated with the respondent's outcome (e.g., male partner's experiences of stressors influences his female partner's smoking). The APIM uses a single analysis to incorporate responses from both members of a couple and treats the members of a couple as nested scores within the same group [62]. A detailed description of APIM analyses using multilevel modeling programs by Kenny, Kashy, & Cook (2006) served as the guide for our analysis plan. Analyses involving hard drug use were restricted to the male data because no females reported hard drug use. To assess whether gender moderated the influence of stressors on all other health behavior outcomes, gender by stressor interaction terms were tested.

Commented [HJ12]: Here it would help to remind the reader of all the outcomes you were interested In, as well as all of the exposures. The results section is rather large – so helps to remind us what you are testing.

All models controlled for age, education, income and race/ethnicity. In addition, analyses controlled for role occupancy (defined in this analysis as whether they worked, went to school or had other children) because people who have greater role occupancy are likely exposed to more stressors.[63].

Commented [HJ13]: From both members of the pair? Possible interactions between the two? Or did you create couple level characteristics – e.g. both partners had at least a HS diploma

c. Results

Demographic characteristics of the participants are displayed in Table IV-1. The young men were generally older, had more personal income, were more likely to be employed, and were less likely to be in school compared to their female partners.

Table IV-1 also shows that young men and women reported similar amounts of stressful life events related to close relationships and stressful life events related to personal hardship (both P>.05). Young men reported more neighborhood problems (xx% vs. xx%, P<.001) and more general discrimination (xx% vs. xx% P=.02) compared to young women. Table IV-2 shows that money problems were the most common life event stressor in the past six months among both men and women. About one third of the respondents also reported moving within the past six months.

Commented [HJ14]: I would think it might be interesting to look at couple level characteristics as well – e.g. age differential of more than 5 years between partners or educational differential, etc?

Commented [HJ15]: Would be helpful to cite the proportions themselves, not just the p-value

Table IV-1. Demographic characteristics, stressors and outcomes from baseline survey?.

	Women		Men		McNemar's Test
	%	(N)	%	(N)	P
Demographics					
Employed	28.40	(84)	60.70	(179)	<0.001
In School	39.50	(117)	26.90	(79)	<.001
First Child	21.00	(62)	24.30	(71)	NS
Race/Ethnicity					
Black	39.50	(117)	48.60	(144)	<.001
Hispanic	39.50	(117)	36.50	(108)	
White	16.90	(50)	10.50	(31)	
Other	4.10	(12)	4.40	(13)	
	Mean	**(SD)**	**Mean**	**(SD)**	**Paired T-Test**
Age	18.71	(1.63)	21.33	(4.06)	<.001
Years School	11.75	(1.82)	11.84	(1.89)	NS
Personal Income ($)	5846	(7458)	10927	(11878)	<.001
Stressors					
Number out of 7? Personal Hardship Stressors	1.46	(1.34)	1.66	(1.63)	0.07
Number out of 4?Close Relationship Stressors	0.63	(0.94)	0.66	(0.93)	NS
Neighborhood Problems (on scale from)	22.41	(7.54)	24.39	(8.35)	<0.001
General Discrimination on scale from …	0.85	(0.81)	1.02	(1.01)	0.02
Outcomes					
Smoking	0.36	(0.95)	1.13	(1.47)	<.001
Drinking	0.05	(0.24)	0.85	(0.98)	<.001
Marijuana Use	0.07	(0.38)	0.81	(1.28)	<.001
Hard Drug Use	--	--	0.25	(1.25)	--
Conduct Problems	24.03	(3.50)	24.77	(3.56)	.005
Depressive Symptoms	10.53	(7.38)	8.88	(6.62)	.002
Protected Sex	18.57	(37.47)	28.36	(43.69)	<.001

Commented [HJ16]: Again – I wonder whether it matters if both were white/black, etc. – so couple level characteristics?

Commented [HJ17]: Need to explain what these mean. Do these seem normally distributed? Perhaps you should consider using a non-parametric test such as paired Mann whitney rank sum to compare medians? My guess is that these are not normally distributed and more bimodal?

Commented [HJ18]: What does this mean? Ever smoked in last 3 months? Number of cigarettes smoked in last 3 months? 6 months.

Table IV-2. Frequencies of individual life event stressors in past 6 months among men and women reported at baseline?.

	Women	Men	McNemar's Test
	%	%	P
Personal Hardship Stressors			
Money Problems	44.6	45.2	.92
Being Unemployed	26.0	33.3	.04
Moving	35.8	29.3	.07
Having something lost or stolen	16.6	22.4	.09
Problems at work or school	13.2	12.2	.80
Problems with police	4.7	13.9	<.001
Suffered illness, injury, assault	4.7	9.2	.05
Close Relationship Stressors			
Broke off steady relationship	26.0	7.1	.06
Relative suffered illness, injury assault	17.6	16.7	.81
Family member or close friend died	24.0	26.2	.49
Serious problem with friend, neighbor, relative	17.2	16.3	.82

Commented [HJ19]: Is this about the current partner? Should these figures be more closely aligned?

Multilevel Regression Analyses

Table IV-3 shows the results of the multilevel regression models examining the association between the stressors and the outcomes. The results below describe the results of the gender interaction analyses.

Personal Hardship Stressors and Health Behaviors and Mental Health

Among the total sample, in adjusted models greater frequency of personal hardship stressors predicted more smoking (B=.08, SE=.04, t=2.09, p=.04), marijuana use (B=.04, SE=.02, t=1.90, p=.06), conduct problems (B=.45, SE=.11, t=4.26, p<.001) and depressive symptoms (B=0.41, SE=0.22, t=1.87, p=.06) (Table IV-3). Gender interacted with personal hardship stressors when predicting marijuana use (t=1.96, P=.05) and alcohol use (t=1.97, P=.05). Greater frequency of personal hardship stressors was associated with more marijuana use (B=.14, SE=.05, t=2.76, P=.006) and alcohol use (B=.10, SE=.04, t=2.817, P=.005) among young men only. Gender also interacted with *partner's* personal hardship stressors when predicting marijuana use (t=2.66, P=.008) and depressive symptoms(t=-2.11, P=.04). Greater frequency of *partner's* personal hardship stressors was associated with less marijuana use (B=-.13, SE=.05, t=-2.48, P=.014) and more depressive symptoms (B=0.77, SE=.28, t=-2.79, P=.006) among young men only.

Close Relationship Stressors and Health Behaviors

Among the total sample, in adjusted models, greater frequency of close relationship stressors predicted more protected sex (B=2.96, SE=1.32, t=2.25, p=.03). Gender interacted with close relationship stressors when predicting smoking (t=2.096, p=.037) and marijuana use (t=2.92, p=.004). Greater frequency of close relationship stressors predicted more smoking (B=.22, SE=.09, t=2.44, p=.015), marijuana use (B=.30, SE=.08, t=3.58, p=<.001) and hard drug use (B=.34, SE=.09, t=3.81, p<.001) among young men only. Gender also interacted with *partner's* close relationship stressors when

Commented [HJ20]: Again it is hard to interpret these beta coefficients without understanding the scale.

Commented [HJ21]: I would include the beta with 95% CIs only throughouot the results section

Commented [HJ22]: So you tested each outcome separately but adjusting for demographics?

Commented [HJ23]: For all of these analyses – the women are currently pregnant, no? did they report much of these behaviors to begin with?

Commented [HJ24]: Throughout the results section, please make it clear whether these are crude or adjusted models

predicting conduct problems (t=2.1, P=.04). Greater frequency of *partner's* close relationship stressors related to more conduct problems among young women only (B=.58, SE=.20, t=2.88, p=.004).

Neighborhood Problems and Health Behaviors

Among the total sample, greater frequency of neighborhood problems predicted more smoking (B=.02, SE=.01, t=2.94, P=.001) and depressive symptoms (B=.07, SE=.04, t=2.00, P=.047) . Gender interacted with neighborhood problems when predicting smoking (t=2.09, P=.037), alcohol use (t=2.63, P=.009), marijuana use (t=3.30, P=.001) and neighborhood problems (t=2.42, P=0.16). Greater frequency of neighborhood problems predicted more smoking (B=.04, SE=.01, t=3.89, P<.001), alcohol use (B=.02, SE=.007, t=3.035, P=.003) and marijuana use (B=.03, SE=.008, t=3.77, P<.001) among young men only. Greater frequency of neighborhood problems predicted more depressive symptoms (B=.12, SE=.04, t=2.71, P=.007) among young women only. Among the total sample, greater frequency of *partner's* neighborhood problems predicted more protected sex (B=.29, SE=.14, t=2.04, P=.04). Gender interacted with *partner's* neighborhood problems when predicting smoking (t=-2.07, P=.039). Greater p*artner's* neighborhood problems related to less smoking among young men only (B=-.02, SE=.01, t=-2.02, P=.04).

Commented [HJ25]: What was the level of agreement between partners in reports on protected sex? Did you code this as proportion of protected sex acts for the couple? What did you do when the reports were wildly different?

General Discrimination and Health Behaviors

Among the total sample, greater frequency of general discrimination predicted more conduct problems (B=1.17, SE=.16, t=7.35, p<.001) and more depressive symptoms (B=1.41, SE=.33, t=4.27, P<.001). Gender interacted with general discrimination when predicting alcohol use (t=2.63, P=.009) and depressive symptoms (t=-2.54, P=.01). Greater frequency of general discrimination predicted more alcohol use (B=.15, SE=.06, t=2.652, P=.008) and hard drug use (B=.22, SE=.08, t=2.82, P=.01) among young men only. Greater frequency of general discrimination predicted more depressive symptoms among both young men (B=2.68, SE=.56, t=4.81, P<.001) and young women (B=.86, SE=.38, t=2.29,

P=.02) although the ~~coefficients~~ effect was much stronger for men than ~~are much different for men and~~ women.

Table IV-3. Multi-level linear regression models examining relationship between stressors (own and partner's) and behavioral risk and depressive symptoms. All models control for age, education, income, race/ethnicity, parity and employment status.

Commented [HJ26]: Do you think linear regression is appropriate for these outcomes or are some of the outcomes skewed and should be transformed on the natural log scale or consider a Poisson regression?

Commented [HJ27]: Rather than SE how about 95% CIs?

	Smoking			Drinking			Marijuana Use			Hard Drug Use[a]			Conduct Problems			Protected Sex			Depressive Symptoms		
	B	SE	t	B	SE	t	B	SE	t	B	SE	t	B	SE	t	B	SE	t	B	SE	t
Personal Hardship Stressors																					
Actor	**0.08**	**0.04**	**2.09***	0.02	0.01	1.37	**0.04**	**0.02**	**1.90‡**	-0.02	0.06	-0.34	**0.45**	**0.11**	**4.26*****	0.00	0.91	0.00	0.41	0.22	1.87‡
Partner	-0.04	0.04	-1.11	-0.02	0.01	-1.58	-0.02	0.02	-0.98	-0.02	0.07	-0.24	0.09	0.10	0.84	-0.93	0.87	-1.07	0.35	0.23	1.54
Close Relationship Stressors																					
Actor	0.00	0.05	-0.01	0.02	0.02	1.27	0.04	0.03	1.75	**0.34**	**0.09**	**3.81*****	0.26	0.15	1.68	**2.96**	**1.32**	**2.25***	0.49	0.33	1.51
Partner	-0.01	0.06	-0.12	0.00	0.02	-0.24	0.02	0.03	0.94	-0.08	0.09	-0.96	0.23	0.15	1.48	0.23	1.35	0.17	0.49	0.33	1.51
Neighborhood Problems																					
Actor	**0.02**	**0.01**	**2.94*****	0.00	0.00	0.27	0.01	0.00	1.63	0.00	0.01	-0.20	0.02	0.02	1.24	0.07	0.15	0.48	**0.07**	**0.04**	**2***
Partner	0.00	0.01	-0.34	0.00	0.00	-1.50	0.00	0.00	-0.92	0.00	0.01	-0.34	-0.01	0.02	-0.37	**0.29**	**0.14**	**2.04***	-0.04	0.04	-1.12
General Discrimination																					
Actor	-0.01	0.06	-0.09	0.02	0.02	0.94	0.03	0.03	0.91	**0.22**	**0.08**	**2.82****	**1.17**	**0.16**	**7.35*****	-0.22	1.41	-0.15	**1.41**	**0.33**	**4.27*****
Partner	0.06	0.05	1.17	-0.01	0.02	-0.83	-0.01	0.02	-0.60	0.07	0.11	0.66	0.10	0.16	0.61	-0.76	1.33	-0.57	-0.15	0.35	-0.45

* P<.05 ** P≤ 0.01 *** P≤ 0.001 ‡ P=.06

[a]Only reported for men

Table IV-4 provides a description of the significant associations between one's own and one's partner's experiences of stressors and behavioral risk among the young men and women within couples.

Table IV-4. Descriptive table of significant associations between stressors and behavioral risk among couples.[a]

Stressor		Women	Men
Personal Hardship Stressors	Own	↑conduct problems ↑smoking ↑depressive symptoms	↑conduct problems ↑smoking ↑drinking ↑marijuana use ↑depressive symptoms
	Partner's		↓marijuana use ↑depressive symptoms
Close Relationship Stressors	Own	↓unprotected sex	↓unprotected sex ↑smoking ↑marijuana use ↑hard drug use
	Partner's	↑conduct problems	
Neighborhood problems	Own	↑depressive symptoms	↑smoking ↑drinking ↑marijuana use
	Partner's	↓unprotected sex	↓unprotected sex ↓smoking
General Discrimination	Own	↑conduct problems ↑depressive symptoms	↑conduct problems ↑drinking ↑hard drug use ↑depressive symptoms
	Partner's		

[a] Examples of how to read this table: Greater frequency of her partner's neighborhood problems related to less unprotected sex among young women only. Greater frequency of one's own close relationship stressors related to less unprotected sex among both men and women.

Commented [HJ28]: Increases? Put the arrows next to these as well?

Commented [HJ29]: In the text you talk about protected sex going up – maybe keep it consistent to make it easier for the reader?

d. Discussion

Our findings demonstrate that one's own experiences of several types of stressors are related to substance use, conduct problems, unprotected sex and depressive symptoms among both expectant women and men. Negative health behaviors common during adolescence and young adulthood predict future patterns of behavior and health outcomes into adulthood. These behaviors carry even more importance among expectant adolescents and young adults because the behaviors have the capacity to also affect the health of their baby.

Commented [HJ30]: Would help if this were a longitudinal analyses to state this – otherwise you are looking at both exposure and outcome from the same timeframe?

Commented [HJ31]: Careful here – not sure it is more important but just rather has implications for the baby as well (really hate how mothers' own health is considered less important than that of her unborn child in general – need to be careful).

The evidence from this study also concurs with the stress and strain cross-over theory, in which stressful experiences in one's own life, cross- over and affect the health and well-being of a close partner[4]. While several studies have demonstrated that maternal stress is associated with poor maternal health behaviors during pregnancy [42,43], this study is the first to show that *paternal* experiences of stress are predictive of maternal health behaviors, including condom use and conduct problems. Previous studies examining the patterns and predictors of maternal health behaviors have largely neglected paternal influences, despite increasing evidence that social relationships influence health behaviors [64].

Personal experiences of stress and one's own health behaviors

This study identified several different domains of stress that significantly predicted behaviors among young men becoming fathers. Notably, greater personal experiences of all sources of stress (relationship stressors, personal hardship stressors, neighborhood problems and discrimination) were associated with more substance use among the young men in this study. While most research has focused on predictors of maternal health behaviors, understanding the predictors of *paternal* health behaviors has important implications not only for his health, but for his pregnant partner's health as well. Men's negative health behaviors, such as smoking, can directly influence maternal health (e.g. by

Commented [HJ32]: Were associated with

increasing her exposure to second hand smoke) and men's health behaviors can influence his partner's health behaviors. For example, studies have shown that women are less like to quit smoking during pregnancy if her partner smokes [65]. Programs and interventions that aim to reduce substance use among young expectant mothers may be more effective if the substance use of *both* parents is addressed.

Previous research has also largely focused on the negative influence of stress on risk behavior. In this study, not all experiences of stress were associated with *more* risk behavior. In fact, some experiences of stress predicted less risk- and more protective behaviors. Among both men and women, one's own experiences of relationship stressors were associated with less unprotected sex. Because the relationship stressor items included breaking off a steady relationship and having a serious problem with a close friend, this finding may indicate that participants with less stable or more conflicted romantic relationships may perceive more risk from their partner and may then use condoms with this partner to protect themselves.

Among the young women in this study, however, significant associations between stress and substance use were sparse. I did find, however, that experiences of personal hardship stressors were associated with more smoking among women. The lack of consistent associations between maternal stress and substance use in this study may be an artifact of the low prevalence of substance use among the women. These results, however, may show that the stressors that affect paternal and maternal substance use during pregnancy may be different. Previous research has shown that different types of stressors predicted smoking among adolescent girls compared to boys [66]. Previous research has shown that young men and women may use different coping mechanisms to deal with stress[15,67] and the evidence from this study may suggest that young expectant men use substance use as a coping strategy for stress more often than young expectant women.

Commented [HJ33]: Or at least reporting of it, as they were pregnant – could be hesitant to report

Partner's experiences of stress and one's own health behaviors

A majority of previous evidence supporting the stress and strain cross-over theory has found negative effects of stress and strain on a partner's well-being [5]. Contrary to this evidence and our hypothesis, all of the significant effects of the young men's partner's stress (i.e. the association between women's stress with her male partner's behaviors) were associated with *less risk* behavior and *more protective* behavior. Young women's personal hardship stressors were significantly associated with less marijuana use among her male partner, and more women's neighborhood problems were significantly associated with less smoking and less unprotected sex among her male partner. This study, however, found that young men's depressive symptoms were directly associated with his partner's personal hardship stressors. This evidence is consistent with the theory of empathetic distress in which one partner takes on the experiences of stress and distressed emotions experiences it as one's own." [48]

These findings suggest that not all experiences of stress necessarily translate into negative effects on a partner. Popular culture may portray young expectant women's partners only as sources of stress or complication; however, the findings from this study suggest that young men who see that their partner is under significant stress, may improve their health behaviors for their partner's benefit and may empathize with their partner's troubles to the point that they take on the distressed emotions as their own. For all of the negative portrayal of young fathers, they can be an important source of support [68] and fathers may have a meaningful influence on the health behaviors of their pregnant partners [69].

Strengths, Limitations and Future Research Directions

This secondary data analysis has several limitations. This study was cross-sectional and therefore experiences of stress and behavioral risk were assessed at the same point in time limiting our ability to infer causation. The timeframes referenced by each question, however, make the direction of

the hypothesized association plausible. The risk behavior items referred only to behaviors in the previous 3 months. Both personal hardship and close relationship stressors referred to experiences within the past six months. While neighborhood problems and general discrimination were more general questions referring to their daily life, these constructs are likely consistent over time.

Also, pregnant women reported few negative health behaviors in this study during pregnancy. Therefore, the association between experiences of stress and behavioral risk among the women in this sample may be spurious; regardless, I was able to identify a few significant relationships between stress and health behaviors among the women.

Despite these limitations, this study is one of the few that includes a direct report from men of their experiences of stress during their partner's pregnancy and its relationship to risk behavior. In addition, this study includes an assessment of stressors from multiple sources and the distinct relationships with behavioral risk outcomes across these predictors for both men and women. This study also assessed the influence of partner's experience of stress on behavioral risk, which very few studies, if any, have done. In addition, this study assessed stress cross-over from both sides of the couple—many studies just focus on cross-over from one member of the couple to the other [5].

In conclusion, this study filled important gaps in the literature on the factors influencing the health behaviors of young couples expecting a baby. The findings demonstrate that experiences of stress across multiple life domains are associated with both maternal *and paternal* health behaviors among young couples during pregnancy. Interventions that address healthy coping mechanisms among this population may help reduce these unhealthy behaviors. Programs and interventions targeting prenatal health behaviors (particularly among adolescents and young adults) overwhelmingly neglect young male partners of the expectant young woman. These findings indicate that stress is associated with young men's health behaviors during this time. These health behaviors have important implications for their health into adulthood and for the health of their child.

This research also revealed that young women's experiences of stress can cross-over and impact the health behaviors of her romantic partner—but, not in the expected negative direction. The more stress a young expectant woman experienced in multiple domains, the less risk behavior her young male partner reported. The male partners of young expectant women can be an important source of support and may have a significant influence on the health of their pregnant partners. It is critical that programs and interventions aimed to improve prenatal health behaviors of young expectant women include romantic partners and address the importance of the influence of this relationship on their own and their baby's health.

Commented [HJ34]: When feasible and desired by the woman – I think this is important to note, as there can be a fine line when the relationship is an abusive one.

Appendix IV-1. Outcome and Confounder descriptions and details

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
Outcomes						
Smoking	Recreational Drug Use Scale[59]	Frequency of smoking	5-pt scale ranging from 0 "Never" to 4 "Every Day."	Baseline	Past 3 months	--
Drinking	Recreational Drug Use Scale[59]	Frequency of drinking alcohol	5-pt scale ranging from 0 "Never" to 4 "Every Day."	Baseline	Past 3 months	--
Marijuana Use	Recreational Drug Use Scale[59]	Frequency of smoking marijuana	5-pt scale ranging from 0 "Never" to 4 "Every Day."	Baseline	Past 3 months	--
Hard Drug Use	Recreational Drug Use Scale[59]	Frequency of use of crack, heroin, methamphetamines, and "other hard drugs"	5-pt scale ranging from 0 "Never" to 4 "Every Day."	Baseline	Past 3 months	Items were summed to form a total *hard drug use* score (range: 0 to 16)
Unprotected Sex	Developed for PARTNRS	Asked respondents t# of times had sex with most recent partner and, of those, the # of times they used a condom.	--	Baseline	Past 1 month	% protected sex was calculated from the ratio of number times they used condoms to number of times they had sex, with respondents not having had sex coded as 100% protected sex.
Conduct Problems	DSM Conduct Problems Scale[60]	Assessed whether participant engaged in conduct problems such as got in a fight or skipped school or work.	4-point scale ranging from 1= "5 or more times" to 4= "Not at all."	Baseline	Past 6 months	7 items were summed to form a total score with higher scores indicating fewer problems (range: 7-28)

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
Depressive Symptoms	Center of Epidemiological Studies-Depression Scale (CES-D).[51] (adapted)	15 items assessed how often experienced the depressive feeling or thought (e.g. I felt depressed, had crying spells) -Five behavioral manifestations of depression items were removed	4-point scale ranging from 0 ("Rarely or none of the time (less than 1 day") to 3 ("Most of the time (5-7 days)")	Base (24-40 weeks pregnant)*	Past Week	-Responses summed to form a continuous scale -Higher scores correspond to more depressive symptoms (range: 0-45) (α = 0.84, α = 0.78 m)
Confounders (Maternal and Paternal)						
Age	--	Summary variable created by from birth date.	--	Baseline	Current	Continuous
Personal Income	--	Asked: " What is your personal income (the total income before taxes earned by you only per year)	0 $0-$4,999 1 $5,000-$9,999 2 $10,000-$14,999 3 $15,000-$19,999 4 $20,000-$24,999 5 $25,000-$34,999 6 $35,000-$49,999 7 $50,000 or more	Baseline	Current	Categorical
Employed	--	Asked: "Are you currently employed?"	1 Not working 2 Working Part-time 3 Working Full-time	Baseline	Current	Categorical
In School	--	A summary measure created to indicate if the participant is either in school and/or working at least part-time.	1 Yes 0 No	Baseline	Current	Dichotomous
Years School	--	Greatest number of years of education completed	Values of 1-12 indicate years of primary or secondary school education completed. If marked "Some college", they	Baseline	Current	1-20

Construct	Measure	Description	Response Scale	Time Points Assessed	Time Frame Referenced	Summary Measure
			were given a value of 14. If marked that they "Graduated college" they were give a value of 16. If marked "Some graduate or professional school" they were give a value of 18. If marked "Completed graduate or professional school" they were given a value of 20.			
Race/Ethnicity	--	Variable constructed from two questions, the first asking their race (select all) and the second asking if they are Hispanic or Latino. Coded as black if selected black (regardless of ethnicity), Hispanic if selected Hispanic or Latino (regardless of race), white if they selected white only. All other participants were grouped into the "Other" category due to low sample size.	1= White 2= Black 3= Hispanic 4= Other	Baseline	Current	Categorical
Confounders (Maternal Only)						
Parity (First Child)	--	Assessed # of biological children the respondent had	--	Baseline	Current	A dichotomous variable was created indicating whether the index child was their first child or not 0=No 1=Yes

Appendix III-2. Variable details, items, validity and reliability

Stressful Life Events

This 11-item scale was adopted from the 12-item Life Events Scale, which was created by Brugha and Cragg (1990).[49] This scale asks participants if they have had stressful life events. 10-items out of the original 12-items were incorporated into the questionnaire, however, three original items were revised: "You became unemployed or you were seeking work unsuccessfully for more than one month" was changed to "In the past 6 months, did you become unemployed or were seeking work unsuccessfully," "You had a major financial crisis" was changed to simply "In the past 6 months, did you have money problems," and "You had problems with the police and a court appearance" was changed to "In the past 6 months, did you have problems with the police." Additionally, two questions were combined and changed into one question: "Your parent, child or spouse died" and "A close family friend or another relative (aunt, cousin, grandparent) died" were combined and shortened into "In the past 6 months, did a close family member or friend die."

Additionally 2-items were added for the research study including: "In the past 6 months, did you have problems at work or school," and "In the past 6 months have you moved." Two of the original items from the LEQ were also omitted from the research study including: "You had a separation due to marital difficulties" and "You were sacked from your job."

The test-retest reliability of the Life Events Scale is reported as .84 for a three-month period and .66 for a six-month period. Data on internal consistency are not available. Concurrent validity estimates were derived from the concordance between inpatient psychotic patients' identification of stressful events and those identified by a significant other; there was a 90% agreement when assessed at a three-month period and a 70% agreement when assessed at six months. The authors also used an extensive interview of stressful events as a base rate and showed that the LEQ was sensitive to the identification of stressful events.[49]

Two subscales were created for use in this study: **personal hardship stressors** and **close relationship stressors**. The items in each subscale are listed below.

Items:

In the past 6 months:

Personal hardship stressors

have you suffered a serious illness, injury, or assault?
did you become unemployed or were seeking work unsuccessfully?
did you have money problems?
did you have problems with the police?
did you have problems at work or school?
was something you valued was lost or stolen?
have you moved?

Close relationship stressors

did a close relative suffered a serious illness, injury, or assault?
did a close family member or friend die?
you break off a steady relationship?
did you have a serious problem with a close friend, neighbor, or relative?

General Discrimination

An adapted version of the Daily Life Experiences Scale was used to assess participant experiences of discrimination.[50] The original Daily Life Experiences Scale has 20-items, however the adapted version used 19 of those items. The items how often the survey taker has experienced discrimination (e.g. Being observed or followed in public places). The response scale ranged from 0 to 5: 0= "never," 1= "less than once a year," 2= "a few times a year," 3= "about once a month," 4= "a few times a month," and 5 = "once a week or more." Responses to items were summed to form a total score ranging from 0-95.

Four items from the original scale were also revised, including "Being mistaken for someone else of your same race (who may not look like you at all)" was changed to "mistaken for someone else (who may not look like you at all)" and "Being asked to speak for or represent your entire racial/ethnic group (e.g. What do ___people think?)" was changed to "asked to speak for or represent an entire group (e.g. What do ___people think?), "Overhearing or being told an offensive joke or comment" was changed to "hear an offensive joke or comment" and "Being avoided, others moving away from you physically" was changed to "avoided, or do others move away from you physically." There was also one item added: "Someone in the health system showed you hostility or a lack of respect, refused you service or paid less attention to you compared with others" and one item was omitted "Being considered fascinating or exotic by others."

Items

In general, how often are you ignored, overlooked, or not given service (in a restaurant, store, etc.)?
In general, how often are you treated rudely or disrespectfully?
In general, how often are you accused of something or treated suspiciously?
In general, how often are you do others react to you as if they were afraid or intimidated?
In general, how often are you observed or followed while in public places?
In general, how often are you treated as if you were "stupid", being "talked down to"?
In general, how often are your ideas or opinions minimized, ignored, or devalued?
In general, how often do you hear an offensive joke or comment?
In general, how often are you insulted, called a name, or harassed?
In general, how often do others expect your work to be inferior?
In general, how often are you not taken seriously?
In general, how often are you left out of conversations or activities?
In general, how often are you treated in an "overly" friendly or superficial way?
In general, how often are you avoided, or do others move away from you physically?
In general, how often are you mistaken for someone who serves others (i.e., janitor, bed boy, maid)?
In general, how often are you stared at by strangers?
In general, how often are you laughed at, made fun of, or taunted?
In general, how often are mistaken for someone else (who may not look like you at all)?
In general, how often are you asked to speak for or represent an entire group (e.g., "What do _____ people think?")?
In general, how often has someone in the health system showed you hostility or a lack of respect, refused you service or paid less attention to you compared with others?

Neighborhood Problems

This 15-item scale was adapted from the 13-item Perceived Neighborhood Problems Scale[57] in order to assess the participant's perception of their neighborhood's quality. Two items were added to the original scale: "Feeling unsafe after dark" and "drugs." Participants are asked to respond using the scale: 1 = "Not a problem," 2 = "Minor Problem," and 3 = "Serious Problem."

The 15 items were summed to form a total score.

Items

In your neighborhood, how much of a problem is….

- Vandalism
- Litter and rubbish
- Assault and muggings
- Disturbance by children or youngsters
- Speeding traffic
- Nuisance from dogs
- Reputation of neighborhood
- Smells and fumes
- Burglaries
- Discarded needles and syringes
- Uneven or dangerous pavements
- Lack of safe places for children to play
- Lack of recreational facilities
- Feeling unsafe after dark
- Drugs

Conduct Problems

Conduct problems were assessed by means of an adapted, 7-item version of the DSM Conduct Problems Scale.[60] Participants indicated how often they had various conduct problems in the previous 6 months on a 4-point scale ranging from 1= "5 or more times" to 4= "Not at all." The original DSM Conduct Problems Scale included 17 items and was based on the criteria for a DSM-III-R conduct disorder. The internal consistency of the items in the original scale among a sample of gay/bisexual youth was .74.[60] The 7 items were summed to form a total score.

Items

Please mark how often you have done the following in the last 6 months.

Skipped school or work?
Yelled at a friend or family member?
Got into an argument with others?
Got in a fight.
Said things that weren't true?
Stole something?
Been in trouble at school or work?

Depressive Symptoms

Fifteen items were adapted from the 20-item Center for Epidemiologic Studies Depression Scale (CES-D), which was developed by Radloff (1977).[51] The items address whether the participant felt or exhibited the behavior of the major components of depression in the previous week (e.g. I felt that everything I did was an effort). As the original CES-D scale specified, participants were asked to respond using: 0= "rarely or none of the time (less than 1 day)," 1= "some or a little of the time (1-2 days)," 2 = "Occasionally or a moderate amount of the time (3-4 days)," and "Most or all of the time (5-7 days)." The five behavioral manifestations of depression items were removed, including item did not feel like eating, trouble keeping mind on what I was doing, everything I did was an effort, my sleep was restless, and could not get going.

The CES-D scale discriminates strongly between patient and general population groups, be sensitive to levels of severity of depressive symptomatology, and reflect improvements after psychiatric treatment. In addition, it should correlate well with other scales designed to measure depression, and be related to a felt need for psychiatric services.[51]

The CES-D scale has been found to have high internal consistency (coefficient alpha =.85 in the general population and .90 in the patient sample); studies found that both inter-item and item-scale correlation were higher in the patient sample than in the population samples. The scale also has moderate test-retest reliability (r between .45 and .70). Test-retest correlation was higher for shorter time intervals.[51]

Items

During the past week…

I was bothered by things that usually don't bother me.
I felt I could not shake off the blues even with help from my family or friends.
I felt that I was just as good as other people.r
I felt depressed.
I felt hopeful about the future. r
I thought my life had been a failure.
I felt fearful.
I was happy. r
I talked less than usual.
I felt lonely.
People were unfriendly.
I enjoyed life. r
I had crying spells.
I felt sad.
I felt that people disliked me.

r=reverse coded

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The Impact of Climate Variability and Conflict on Childhood Diarrhea and Malnutrition in West Africa

A dissertation submitted to the Graduate Faculty in Public Health in partial fulfillment of the requirements for the degree of Doctor of Public Health, The City University of New York

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The Impact of Climate Variability and Conflict on Childhood Diarrhea and Malnutrition in West Africa

by

This manuscript has been read and accepted for the
Graduate Faculty in Public Health to satisfy the dissertation
requirement for the degree of Doctor of Public Health

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Dissertation Abstract

Title: The Impact of Climate Variability and Conflict on Childhood Diarrhea and Malnutrition in West Africa

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Objectives: This dissertation aims to contribute to our understanding of how climate variability and armed conflict impacts diarrheal disease and malnutrition among young children in West Africa. Two studies examine the associations between climate and diarrheal disease across the whole study area – ten countries in West Africa during the period 2008-2013. The third study examines diarrheal disease and malnutrition in Northeast Nigeria before (2008) and after (2013) the start of the current armed conflict in the area.

Methods: Outcome variables and child, caregiver, and household characteristics for these studies are from the Demographic and Health Surveys. Additional datasets include specialized products for rainfall, temperature, climate class, population density, and urban population ranking. The first two studies use geospatial techniques to 1) determine if there are areas of elevated risk after controlling for climatic and other covariates and 2) determine whether there is spatial variation in the associations between diarrheal disease and climatic and other covariates. The third study uses a double-difference methodology to study both diarrheal disease and malnutrition and their associations with conflict.

Results: The first study found statistically significant clusters of elevated risk in 10 urban areas and 13 largely rural areas after adjusting for household and climatic factors with a relative risk range of 1.5 to 7.2. Results from the second study indicate that the associations between diarrheal disease and key household, environmental, and climatic factors vary according to location – a phenomenon which is masked by global

models - and that the associations are both positive and negative (increase and decrease risk). The third study found that if children exposed to the conflict in Northeast Nigeria had not been exposed, their mean weightfor-height z-scores would be nearly half a standard deviation higher, the proportion of moderately and severely wasted children would be 13 percentage points lower, and the prevalence of diarrhea would be 8 percentage points lower than they are.

Conclusions: The studies in this dissertation provide additional evidence for the relationships between climate variability, conflict, and child health in West Africa. Previous studies have provided mixed evidence for the role of factors such as rainfall on child health outcomes. Here, geo-spatial methods identify both areas of heightened risk and the role of specific risk factors in particular locations. For example, the first study found elevated risk of diarrheal disease in northern Cameroon and the second study indicates that two risk factors in that area are low coverage of improved sanitation facilities and low rainfall at the time of the survey. The effects of conflict on child health are conceptually inherent and have been quantified with different methods and outcomes. The research here furthers those efforts by quantifying the impact of a particular conflict – the Boko Haram insurgency - on the health and growth of young children.

The findings from this research support on-going development goals which aim to improve modifiable factors including increased coverage of improved water sources and sanitation facilities, increased educational attainment, the alleviation of poverty and food insecurity, and resolving on-going conflicts around the world. The results also support adaptation measures, which are aimed at factors that are difficult to change in themselves, such as living in areas where temperatures are increasing due to climate change. Such measures include promoting income diversification and access to goods and services for farmers and pastoralists and

improving infrastructure and public services in urban areas. Limitations, including spatial, temporal, and methodological issues with the data sources are discussed, as are suggestions for future research.

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Chapter 1. Introduction

This dissertation is concerned with two aspects of environmental health – climate variability and conflict – and their impact on children in the developing world. The outcomes studied are diarrheal disease and malnutrition. The population of interest is children under five years old in West Africa (Figure 1.1). This subregion was chosen because of its compelling burden of disease, variation both socially and climatically, and on-going challenges such poverty and armed conflicts:

- Population health has improved greatly in sub-Saharan Africa, yet in 2013, the region contributed 50% of global child deaths.[1] Forty-two percent of those deaths were in the sub-region of West Africa.[2] The causes in West Africa were primarily infectious diseases such as diarrhea, pneumonia, and malaria; neonatal disorders; and nutritional deficiencies.[3]
- The nations of West Africa have many cultural, economic, and political linkages, yet are on distinct development paths with some countries steadily improving over recent years (Senegal, Benin), others worsening (Mali), and some staying relatively steady but with poor standing in world rankings of key indicators (Guinea, Cote d'Ivoire).[4]
- The majority of people in West Africa are still quite exposed to the natural environment with rudimentary physical barriers (e.g., adequate shelter) and policy barriers (e.g., water quality standards).
- West Africa has a varied climate, from the humid coast with up to 10 meters of rainfall to the arid desert with months of no rainfall at all.[5] Temperatures range from an average monthly low of 23□C to an average monthly high of 33□C.[6]

- With its direct effects on health and as an obstacle to development, armed conflict is a major public health issue in Africa.[2] In 2014, there were 9 armed conflicts in sub-Saharan Africa and two of those were in West Africa (Nigeria and Mali) with several other areas of lower intensity unrest.[7]
- Sub-national survey data on child health and key covariates were available for several countries in West Africa within a reasonable timeframe from the Demographic and Health Surveys.[8]

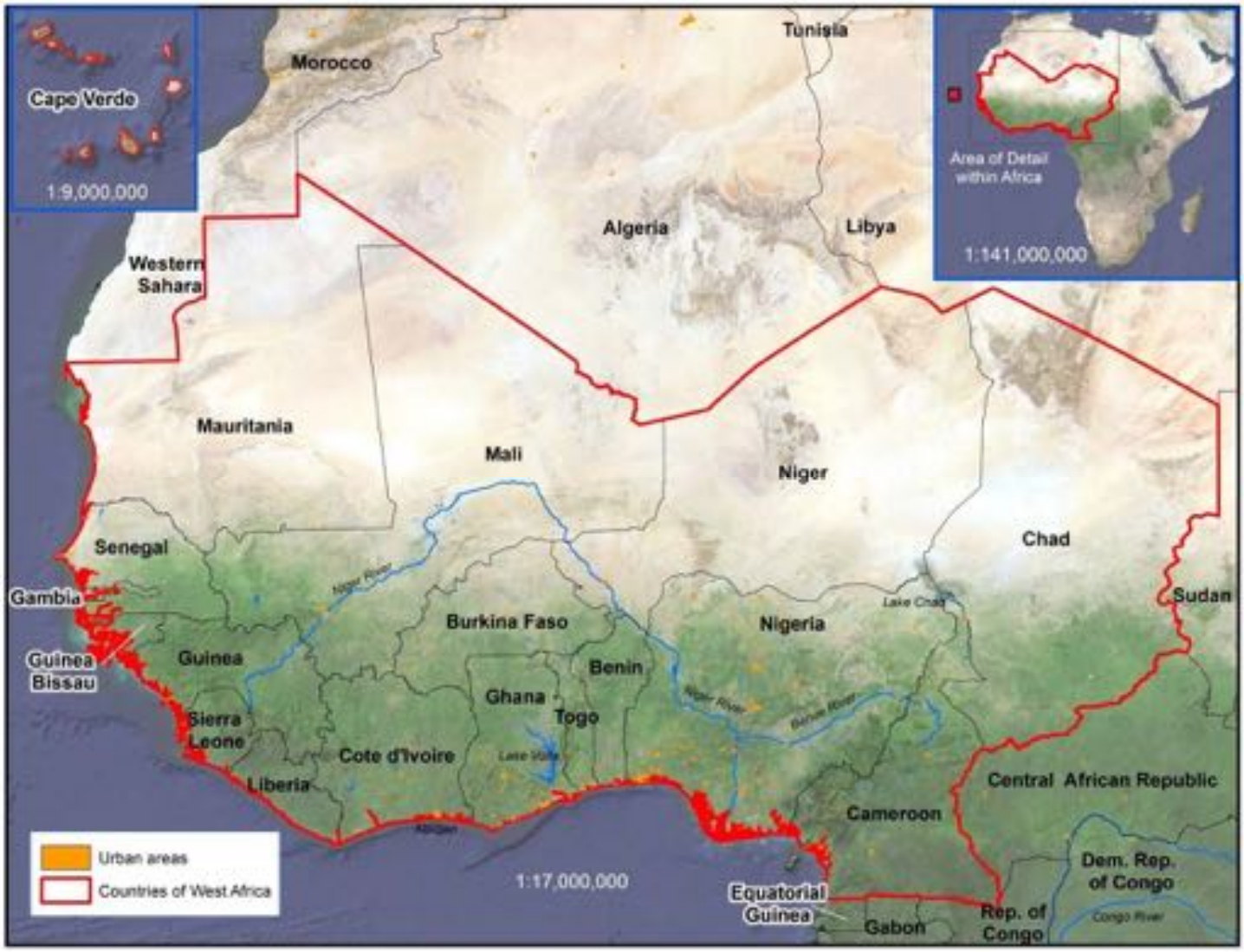

Figure 1.1: Countries of West Africa, using the definition from the Organisation for Economic Co-operation and Development (OECD): the 15 members of the Economic Community of West African States (ECOWAS) plus the three bordering countries of Mauritania, Chad, and Cameroon.[9] Cape Verde is an island nation 500 km west of Senegal. The Sahel is the southern edge of the Sahara Desert, seen in this composite satellite image as the transition from green vegetation to tan sands.

1.1 Childhood diarrhea and malnutrition

Diarrhea is a leading infectious cause of death in children under five years old worldwide.[1] Although mortality attributable to diarrhea has decreased significantly over the past 15 years, morbidity has changed little.[10] In 2013, 578,000 children died from diarrhea (uncertainty range 448,000 – 750,000).[1] Fifty-four percent of those deaths were in sub-Saharan Africa and 25% of those were in Nigeria.[11] There are approximately 1.7 billion global cases of childhood diarrhea every year.[12,13]

Malnutrition is also a leading cause of illness and death in children in the developing world.[14] Nutritional deficiency is the primary cause of death in 6.7% of deaths in children between 28 and 364 days and 7.2% of deaths in children between 12 and 59 months (136,000 and 142,000 deaths, respectively, in 2010).[15] However, malnutrition is more important as an underlying condition which contributes to child mortality.[14] It is indicated in about 45% of all child deaths worldwide and in 60% of child deaths attributed to diarrheal disease.[16,17] Globally in 2014, about 50 million children were wasted (thin for their height due to acute malnutrition) and 159 million were stunted (short for their age due to chronic malnutrition).[18] Approximately 28% of wasted children and 37% of stunted children live in Africa.[18] The West Africa sub-region has one of the highest burdens of malnutrition; in 2014, 9% of the children were wasted (the public health emergency threshold is 10%).[18]

Infectious diarrhea is caused by a variety of bacteria, viruses, protozoa, and helminthic organisms.[17] These pathogens - which are transmitted largely through the ingestion of contaminated fecal matter - cause an infection of the intestinal tract which disrupts normal gut functioning.[17] Severe cases of diarrhea can lead to extreme dehydration and death.[19] This makes children under five years old particularly vulnerable to the disease because - relative to older children and adults – their immune systems are not as developed, water

makes up a larger proportion of their bodyweight, they ingest more water because of their higher metabolic rates, and their kidneys are not able to conserve as much water.[19]

In the direct sense, malnutrition (or more accurately for this dissertation, undernutrition) is caused by a lack of food quantity and/or nutritional content which leads to growth failure and/or micronutrient deficiencies.[20] However, as with diarrheal disease, the underlying causes are more complex. Poverty, which plays a central role, is influenced by factors such as the socio-political context and the natural environment.[21] In turn, poverty can lead to food insecurity, unhealthy environments such as a lack of adequate sanitation, and limited access to quality health care, all of which result in illness and death among children.[21]

A child with repeated diarrheal episodes may experience a deficit of caloric intake and micronutrients due to intestinal malabsorption.[17] This can result in rapid weight loss and increased vulnerability to infection due to the breakdown of mucosal barriers.[17] At the same time, the child is growing weaker and his immune system may become compromised, making him more vulnerable to diarrheal and other infections.[17] Thus, diarrhea and malnutrition have a bi-directional association with one causing the other and forming a vicious cycle that can lead to severe illness and death. Since this cycle is most common at ages critical to physical growth and brain development, longer-term consequences may include stunting; impaired intellectual development and school performance; decreased economic productivity and reproductive performance; and increased risk of metabolic and cardiovascular disease.[21,22]

Figure 1.2 is a conceptual framework showing the relationships among diarrhea, malnutrition, and their underlying causes.

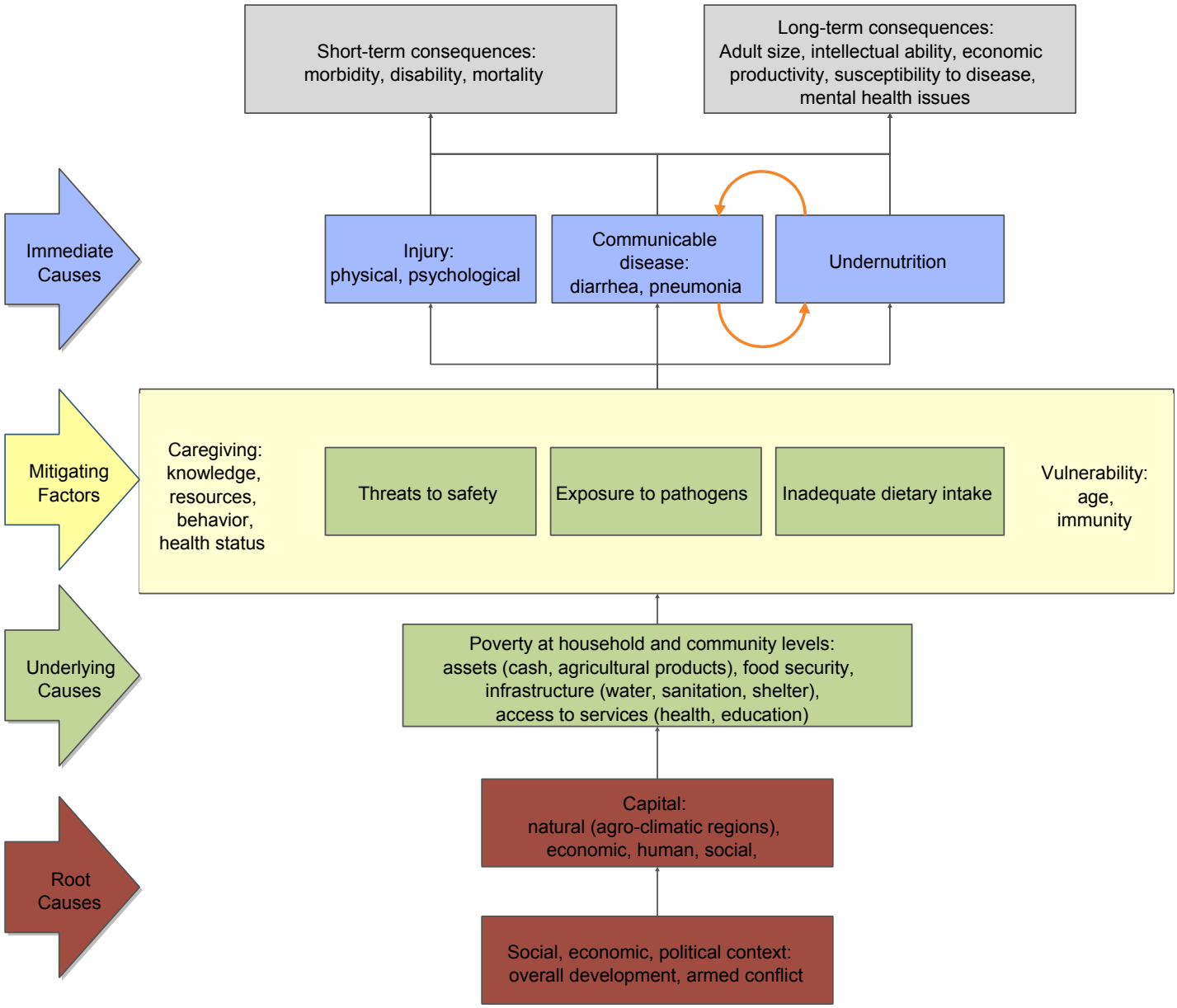

Figure 1.2: Framework of the relationships among root, underlying, and immediate causes of communicable diseases such as infectious diarrhea; undernutrition; and injuries (other non-communicable diseases are not shown). Mitigating factors influence whether and how underlying causes affect a child and whether the immediate causes are lessened or avoided. Orange arrows depict the cyclical nature of recurring infections and malnutrition. Based on frameworks from Black et al (2008), World Health Organization (2010), and Guha-Sapir & van Panhuis (2002).[21,23,24]

Preventative and therapeutic measures to combat diarrhea and malnutrition morbidity and mortality are also linked. Breastfeeding is protective because it provides adequate and complete nutrition for young children, helps build their immune systems, and reduces their exposure to unsafe water and food.[25,26] Even after weaning, appropriate child feeding, including complementary and supplementary foods as needed, is also key

to development and health.[27] Zinc supplementation as a therapeutic and preventative measure curtails the severity and duration of diarrheal episodes, helps protect against future episodes, and also increases growth and weight gain in young children.[17,27] Other supplementation such as Vitamin A for children and folic acid for pregnant women is also necessary in high-risk populations. Some of the most important preventative measures against infectious diarrhea are those that improve hygiene practices, sanitation systems, and safe water consumption.[28] A comprehensive review of these interventions found reductions in diarrhea incidence of 48%, 36% and 17% associated with handwashing with soap, contained excreta disposal, and improved water quality, respectively.[29] While still not widely accessible in resource-poor settings, vaccines against some enteric pathogens such as rotavirus and cholera have shown to be effective.[30]

1.2 Climate variability and health

Climate variability is the change in factors such as precipitation and temperature over a timescale of months, seasons, and years.[31] There are two parts to the measurement of climate variability – average and range.[31] Averages are usually taken over a thirty-year period for a given area which smooths any fluctuations.[31] Range – highs, lows, and extreme events – show deviations from the trend line.[31]

In West Africa, climate variability is dominated by the dry and wet seasons which result from the migration of two air masses (Figure 1.3).[32] The first air mass is hot and dry and blows from the Sahara southwards from November to February, reaching between latitudes 5° and 7°N (the southern coast of West Africa) in January.[32] The second air mass creates southwest winds which carry moist air from the ocean inland, reaching between latitudes 18° and 21°N (northern Mali, for example) in July.[32]

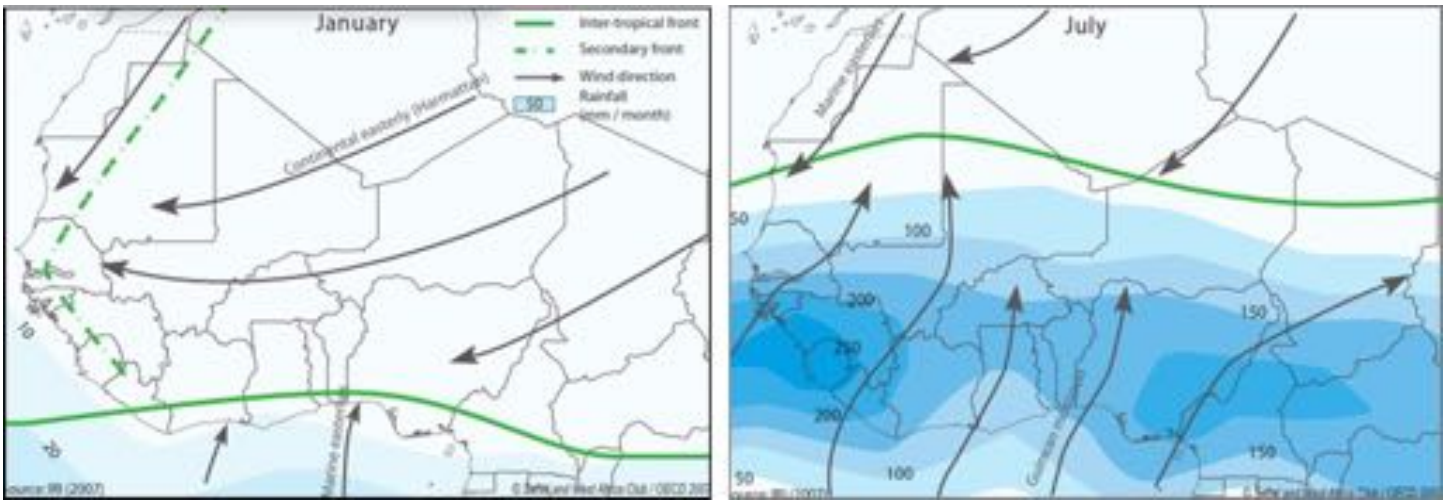

Figure 1.3: Graphic of seasonal climate variability in West Africa with the height of the dry season in January (left) and the wet season in July (right). From Jalloh et al (2011).[32]

Local air temperature is determined not only by latitude, but by elevation, land coverage, distance from the coast, and wind strength and direction among other factors. In West Africa, the influence of latitude and distance from coast is evident on a country-level scale: higher latitude (more desertic) countries and those that are land-locked (e.g., Burkina Faso) have overall higher temperatures than those closer to the equator, which are coincidentally coastal. Furthermore, the range of temperatures is greater throughout the year for higher latitude/landlocked countries, whereas equatorial countries stay within a narrower range of temperatures (about 15°C as opposed to 22°C).[6]

Seasonal and interannual climate fluctuations have direct consequences on human health, especially among poor, agriculture-dependent populations at low latitudes where climate-sensitive health outcomes such as diarrheal disease, malnutrition, and malaria are prevalent.[33] Since these diseases affect children the most, the overall disease burden due to climate (and climate change) is borne by children in developing countries.[34]

Climatic factors such as temperature, rainfall, relative humidity, and air pressure directly influence the presence of diarrheal pathogens in the local environment.[35] These factors are in turn regulated by seasonal

changes so that, for example, bacterial loads in food and water may increase in warmer periods, viruses flourish in cooler periods, and protozoa are more common in wet and warm conditions.[36] A few studies have quantified the relationship between diarrhea, climate variables, and seasonality. The most relevant of these are from sites with similar climate types as those found in West Africa. In Lima, Peru (the same climate type as the Sahara), Checkley (2000) found that hospital admissions for children with diarrhea increased by 8% for every 1□C from the previous mean temperature.[37] During an El Niño year when temperatures were up to 5°C above normal, diarrheal hospitalization rates among children increased to 200% the previous rate.[37] A study in Taiwan - parts of which have the same climate type as the south coast of West Africa – found that extreme rainfall events (>350 mm/day) were associated with a 6-fold increase in the relative risk of reported enterovirus infection and a nearly 8-fold increase for bacillary dysentery compared with normal (<130 mm/day) events.[38] A meta-analysis of childhood rotavirus infection in India, Pakistan, Bangladesh, Nepal, and Bhutan – which include the four climate types found in West Africa – found that a 1□C decrease in monthly ambient temperature was associated with a 1.3% increase from the annual rate of rotavirus infection.[39] Additionally, a decrease of 10mm in precipitation was associated with a 0.3% increase of infection.[39] In several settings, diarrhea transmission has been found to increase during normal rainy seasons due to fecal contamination of water sources.[40] However – perhaps particularly in areas that are overall more arid – diarrhea incidence may be higher in the dry season due to food insecurity and increased transmission by flies, which touch down on feces and transmit pathogens to food, surfaces such as in the food preparation area, or directly into the mouth of a child.[21,41,42]

Most of the world's food insecure and undernourished populations are in sub-Saharan Africa and South Asia.[43] Again, the causes are bi-directional, but these regions are largely rural, poor, and dependent on rain-fed

agriculture.[44] Large areas of these regions have low agricultural productivity in part due to climatic risks – not only extremes such as droughts and floods, but also more minor fluctuations such as a late rainy season.[44]

1.3 Armed conflict and health

In the post-Cold War period, many West African nations have been affected by various forms of conflict from civil wars (Liberia, Sierra Leone, Côte d'Ivoire, Guinea-Bissau), to coups d'état (Guinea, Côte d'Ivoire, Mali, Gambia, Niger) to ethnic and religious clashes (Nigeria, Mali, Benin).[45] While there is no one unifying theory as to the causes of conflict in Africa, weak governance seems to be a common factor.[46] Fragile states often cannot establish and maintain democratic systems, support economic development, control threats to security, and ensure the equitable sharing of natural resources.[46] While poverty in itself is not necessarily a driving force (many poor countries have been at peace for decades), inequality often is.[46] Similarly, ethnic or religious diversity is not often a root cause, but marginalization and disillusionment with the government can lead people to identify more with a particular group than with the state or larger society.[46]

Conflict affects child health through multiple pathways both directly and indirectly. Community and household resources may be diminished as funds are diverted away from social services (such as immunization programs), prices for food and other commodities rise, and fear or physical obstacles (checkpoints, landmines) prevent caregivers from pursuing the family's livelihood activities (such as accessing fields and livestock grazing lands).[47,48] Infrastructure such as health facilities, markets, water supply and sewage systems, schools and roads may be damaged or otherwise inaccessible.[47,48] Supply chains for food imports and essential medicines are often disrupted.[47,48] Populations may be forced to leave a conflict zone which could expose them to inadequate shelter, water, sanitation, and food and deprive them of livelihoods.[47,48] Displacement puts additional stress on host populations and their services and could increase population density.[48] Skilled healthcare and other personnel may leave the area and the most vulnerable households may be unable to do

so.[48]

Most deaths due to conflict, particularly for children, are not from direct causes such as war-related trauma, but are due to the conditions that were already the main causes of death before the conflict including diarrheal disease, acute respiratory infections, measles, malaria, and severe malnutrition.[49] Therefore conflict seems to both exacerbate pre-existing health issues and introduce new ones.[49,50]

The effects of war on child health are often studied through household surveys either in real time or retrospectively. In one of a series of mortality surveys in the Democratic Republic of Congo, a strong association between conflict and both violent and non-violent deaths was found.[51] In conflict and non-conflict areas of the country, the main reported causes of death were fever and malaria, diarrheal disease, and respiratory infections.[51] Children are most vulnerable to these diseases and those under five had nearly four times the risk of dying than people five and older.[51] Malnutrition was reported as an underlying or primary cause of death in 10.9% of deaths in conflict areas and 8.1% in non-conflict areas.[51] In Burundi, the civil war of the 1990s was marked by displacement, looting of household assets (including livestock), and the theft or burning of crops.[52] Using a spatiotemporal conflict exposure variable, researchers found that rural children who had been exposed to war for more than 14.7 months (the average exposure time) had height-for-age zscores 0.67 standard deviations lower than unexposed children ($p < 0.01$). Additionally, for every month of exposure, height-for-age z-scores decreased by 0.05 standard deviations.[52] A study in Angola found higher levels of malnutrition (wasting and stunting) in conflict-affected areas and among assumed supporters of the opposition (determined by ethnolinguistic group), even after controlling for urban-rural and other demographic differences.[50]

Although beyond the scope of this dissertation, whether there are linkages between climate variability and conflict is a question that has gained attention recently because a more variable climate is predicted for several regions - including sub-Saharan Africa - due to climate change.[53] There are several theories for how the two are linked: 1) extremes such as drought or flooding cause a scarcity of resources which lead to violent disputes, 2) economic shocks due to climate extremes facilitate the recruitment of insurgents as subsistence economies falter, and 3) climate variability increases the economic divide within societies, exacerbating grievances to the point of violence.[53] There are some case studies which seem to support these theories (for example, disputes over watering holes in Ethiopia grew violent during the drought of 2002); however, there is little evidence at this time to support the overall hypothesis that climate variability causes violent conflict.[53]

1.4 Overall goal of dissertation

Evidence for significant associations between climate variability and child health outcomes is compelling, but lacking for West Africa where the direction (or bi-directionality) and magnitude of associations is largely unknown, as are specific areas of elevated risk. Also lacking is quantitative analysis on the impact of the one of the world's newest conflicts, the Boko Haram insurgency, which currently affects several West African nations. The goal of this dissertation is to address these gaps and contribute to our understanding of how climate variability and conflict impacts diarrheal disease and malnutrition among young children. Two aims examine the associations between climate and diarrheal disease across the whole study area – ten countries in West Africa from 2008 to 2013. Both studies use geo-spatial techniques to 1) determine areas of elevated risk after controlling for climatic and other covariates and 2) determine whether there is spatial variation in the associations between diarrheal disease and climatic and other covariates. The third aim takes a closer look at one particular area – Northeast Nigeria - where high rates of diarrhea were noted in the first two studies and where there is an on-going armed conflict. Diarrhea and malnutrition outcomes are studied using a double-difference methodology.

1.5 Specific aims and hypotheses

Specific Aim 1: To describe the geo-spatial distribution of childhood diarrheal disease across West Africa during the period 2008-2013 with respect to household and climatic characteristics, including identifying any statistically significant clusters of elevated risk.

Hypotheses: Unadjusted prevalence rates will vary across the region and within countries and areas of particularly high or low rates may be seen. However, without adjusting for seasonality (climate class, rainfall, temperature) and household variables (wealth, mother's education, child's age, etc.), it will be difficult to make any conclusions about areas of elevated risk. In adjusting for these factors, household variables will be similar to the associations seen in the literature (e.g., elevated risk with increased poverty, *ceteris paribus*). Diarrhea risk is expected to increase as climate classes go from the wetter south to drier north. Associations between rainfall and diarrhea will show that both extremes (too dry, too wet) will increase the risk of diarrhea. The relationship between temperature and diarrhea will be weaker than for rainfall, and will show increased risk with increased temperature. Cluster analysis will detect specific areas of elevated risk, even after controlling for household and climatic variables. These clusters will be more dominant in rural areas, but certain urban areas may also show heightened risk.

Specific Aim 2: To examine whether there are any significant spatial variations in the relationship between childhood diarrhea and key socio-economic, climatic, and environmental characteristics across West Africa in the period 2008-2013.

Hypotheses: In the global model, risk of diarrheal disease will increase with increases in percent of households with unimproved water sources and toilet types and percent of mothers with no formal education. Risk will also increase with higher latitudes (more arid climate types), temperatures, and population densities (overall urban disadvantage) and will decreases with higher rainfall. In geographically weighted models, climate class/latitude, altitude, and population density will have spatially stationary associations with diarrheal disease (i.e., their effect will be the same across the study area). Rainfall and temperature will show spatially non-stationary associations (for example, rainfall – and the lack thereof - will have a larger effect in dry areas than in areas of moderate precipitation). Associations between diarrhea and percent of population with unimproved water sources and toilet types and percent of mothers with no formal education will be spatially stationary within countries, but spatially non-stationary between countries (for example, the percent of mothers with no formal education will have the same effect on childhood diarrhea wherever they live within a country, but because of different development levels, the association will change from country to country). Associations for socio-economic factors such as education will be positive (e.g., higher percentages of households with unimproved toilets will correlate with higher risk of diarrheal disease). Other factors such as rainfall and population density will show both negative and positive associations (e.g., urban advantage and urban disadvantage).

Specific Aim 3: To examine the associations between the recent conflict in Northeast Nigeria and the prevalence of childhood malnutrition and diarrheal disease.

Hypotheses: Malnutrition and diarrhea rates will be similar in conflict areas and non-conflict areas before the start of the insurgency with a generally improving trend over time, but rates will increase in conflict areas after the start of the insurgency while maintaining a general downward trajectory in non-conflict areas. An

estimation of the counterfactual – the average outcome for conflict-affected children if they had not been affected - will show improvements through increased z-scores (closer to the healthy average) and reduced rates of moderate/severe malnutrition and diarrhea. Weight-for-height and diarrhea prevalence will show the largest effect because these outcomes are sensitive to acute emergencies, while the effects for height-for-age and weight-for-age will not be as evident.

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Map credits

Figure 1.1:

- Food and Agriculture Organization, 2006, MODIS Satellite Image mosaic 2.5d enhanced (~230 m) http://www.fao.org/geonetwork/srv/en/resources.get?id=30977&fname=af_bmng-shd.zip&access=private
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Chapter 2. The Geo-spatial Distribution of Childhood Diarrheal Disease in West Africa: A CovariateAdjusted Cluster Analysis

Abstract

This research describes the geo-spatial distribution of childhood diarrhea in ten countries of West Africa during the period 2008-2013. Logistic regression with household and climatic explanatory covariates was used to obtain predicted diarrhea cases, which were compared to observed cases in a cluster analysis. The regression analysis showed increased and statistically significant odds of diarrhea among children age 12-23 months in poorer and larger households, and where mothers had little education. Overall, children in urban areas had overall higher risk than children in rural areas. Odds of diarrhea increased with latitude from the wetter coastal areas to the drier northern areas. There was a positive linear association between temperature and the odds of diarrhea and an apparent u–shaped association between rainfall and diarrhea, with the lowest odds where there was moderate precipitation. Covariate-adjusted cluster analysis detected statistically significant clusters in ten major cities (e.g., Dakar, Senegal; Yaoundé, Cameroon) and in 13 largely rural areas (e.g., southern Mali). Areas with particularly high relative risk included a small village in south-central Nigeria (6.03), Cotonou, Benin (7.16), and Kaduna, Nigeria (7.21). The study demonstrates the continued importance of development programs (poverty reduction, education) and adaptation measures (food security in a warming Sahel region) to protect child health, and that these interventions should be tailored to meet the needs of specific populations (e.g., sewage systems in certain urban areas).

2.1 Introduction

Of the 6.3 million deaths in children under five years old in 2013, nine percent (567,000) were attributed to infectious diarrhea.[1] Although rates have declined significantly over the past 15 years, diarrhea remains the second leading cause (after pneumonia) of mortality in children in the post-neonate period.[1] In 2010, there were an estimated 1.7 billion cases of childhood diarrhea worldwide.[2] A quarter of these – 437.6 million

episodes – occurred in Africa.[2] In high-burden countries such as Mali, Nigeria, and Burkina Faso, incidence is particularly elevated (3.96, 3.89, and 3.51 episodes per child-year, respectively, compared to the global average of 2.7).[2,3] There is evidence that prevalence varies considerably within countries, yet many countries have a single national strategy to address diarrhea. For example in Nigeria's national health strategy 20102015, there is acknowledgement that children living in the north of the country have higher mortality rates than their southern counterparts, yet there is no mention of specific regional targeting of interventions such as rotavirus immunization.[4]

Diarrhea is a leading cause of malnutrition in young children and together, these conditions form a vicious cycle of decreased energy intake, loss of micronutrients, and increased vulnerability to infection.[5,6] Diarrheal episodes and potential bouts of malnutrition occur at ages critical to physical growth and brain development.[7] As a result, in addition to short-term outcomes (illness, disability, death), there may be longer-term consequences such as stunting; impaired intellectual development and school performance; decreased economic productivity and reproductive performance; and increased risk of metabolic and cardiovascular disease.[8]

There are several known risk factors for childhood diarrhea. Since the most common transmission of diarrheal pathogens is through the fecal-oral route, a majority of cases occur in poor households and areas – both rural and urban - where there is limited opportunity for personal hygiene, inadequate sanitation facilities, limited access to safe drinking water, threats to safe food preparation (such as the presence of flies), and restricted access to quality healthcare.[7,9] Maternal educational attainment is also associated with higher risk, perhaps because the mother is frequently the child's primary - and often only - source of healthcare.[10,11] In low- and middle-income countries worldwide, diarrhea incidence is highest in children aged 6-11 months and then decreases with age.[12]

Less well-understood are risk factors for diarrhea associated with climatic conditions such as temperature and rainfall, which directly influence the presence of diarrheal pathogens in the local environment.[13] For example, bacterial loads in food and water may increase in warmer periods, viruses flourish in cooler periods, and protozoa are more common in wet and warm conditions.[14] Under hot, dry conditions, pathogens can become more concentrated in water sources as evaporation increases, thereby increasing the risk of disease.[15,16] Diarrhea incidence may be higher in the dry season due to food insecurity, reduced hygiene, and increased fly activity.[8,17-19] However, diarrhea transmission has also been found to increase during the rainy season due to fecal contamination of water sources.[20]

Despite progress in understanding the risk factors associated with childhood diarrhea and generally where the burden is highest, few studies have shown how the risk is associated with both household and climatic variables and where specific clusters of risk are located within West Africa, including within countries.

The aim of this study is to describe the geo-spatial distribution of childhood diarrheal disease across West Africa during the period 2008-2013 with respect to household and climatic characteristics, including identifying any statistically significant clusters of elevated risk. West Africa was selected as the study site as the region has a high burden of childhood disease and accounts for the more than 40% of child deaths in subSaharan Africa.[21] West Africa also has a varied climate, which helps to illustrate the role of different types of climatic exposures. The availability of sub-national data within a reasonable timeframe was also a consideration. These factors led to the final ten countries studied: Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Guinea, Mali, Nigeria, Senegal, and Sierra Leone (Figure 2.1).

It is hypothesized that unadjusted prevalence rates will vary across the region and within countries and that areas of particularly high or low rates may be seen. However, without adjusting for seasonality (climate class, rainfall, temperature) and household variables (wealth, mother's education, child's age, etc.), it will be difficult to make any conclusions about areas of elevated risk. In adjusting for these factors, household variables will be similar to the associations seen in the literature (elevated risk with increased poverty, *ceteris paribus*). Diarrhea risk is expected to increase as climate classes go from the wetter south to drier north, which is an overall harsher climate with regards to food security, remoteness, and access to health care. Associations between rainfall and diarrhea will show that both extremes (too dry, too wet) will increase the risk of diarrhea. The relationship between temperature and diarrhea will be weaker than for rainfall because allcause diarrhea will mask the presence of different pathogens, each with a preferred temperature range. Cluster analysis will detect specific areas of elevated risk, even after controlling for household and climatic variables because of community-level factors not included in the analysis. These clusters will be more dominant in rural areas as is the global finding, but certain urban areas may also show heightened risk.



Figure 2.1: Map of the ten West African countries that make up the study area. The northern part of Mali was not included in the data source.

2.2 Methods

Data

This study combines health and climate data from a variety of sources. The outcome of interest – diarrhea episodes among children under five – as well as key household covariates are from the Demographic and Health Surveys (DHS).[22] Urban/rural designations and climate data are derived from specialized products described below.

Demographic and Health Surveys are large, nationally representative household surveys which have been conducted in low- and middle-income countries since 1984.[22] Among the many topics covered are those related to child health; not only specific diseases, but also underlying influences such as household wealth and

the vaccination status of the child. Because the surveys use similar sampling methods and questionnaires, they are considered comparable across countries and time periods.[22]

The DHS uses a two-stage sampling methodology. The country is first stratified by geographic (usually administrative) regions crossed with urban or rural designation.[23] In each stratum, enumeration areas determined by the most recent census are used.[23] In the first stage, a number of primary sampling units are selected from the enumeration areas in each stratum. The household lists in these areas are updated, and a fixed number of households are selected.[23] All household members within a specific group (relevant here is all women age 15-49) in the selected households are chosen for the survey.[23] Those women with children age 0-59 months are asked about the health and care of their children.[23]

Most DHS surveys are now geocoded.[22] A GPS coordinate is recorded at the approximate center of each primary sampling unit.[24] To ensure confidentiality, these sampling point coordinates are then randomly displaced 0-5 kilometers in rural areas and 0-2 kilometers in urban areas.[24] Sampling point coordinates are sometimes not collected or cannot be verified and are listed as missing.[22]

Note that the northern part of Mali was not surveyed in the 2013 DHS and is not included in this analysis (Figure 2.1).

Diarrheal disease

The outcome of interest is whether the child has had diarrhea in the past 2 weeks. Interviewers are trained to explain this means three or more loose or liquid stools per day.[25]

Wealth Index

Rather than using an income-based measure of wealth, which can be difficult to assess in low- and middleincome countries, the DHS uses a Wealth Index developed with the World Bank.[26] The Index is based on assets and services available to the household and contains variables directly and indirectly associated with childhood diarrhea. These variables include the source of drinking water, type of toilet facility, type of flooring, presence of electricity, and the ownership of agricultural land, a refrigerator, and a television or radio (which may be linked to health messaging). Social measures such as education are purposely not included in the Wealth Index.[26] The Index is presented in terms of quintiles based on the population distribution from poorest quintile to wealthiest quintile.

Household size

This is the number of people who usually live and eat together, whether they are related or not, plus any visitors who spent the night before the interview with the household.[25]

Educational attainment of mother

Educational attainment is the highest level attended, but not necessarily finished. Although different countries have different educational systems, this variable has been standardized to include no formal education, primary education, secondary education, and higher than secondary education.[25]

Age of child

The age of the child is measured in months. Here, age has been categorized according to known vulnerabilities and behaviors of children under five such as the introduction of solid food around 6 months and increased mobility around 1 year.[12]

Urban/Rural class

Urban/rural classification was derived from the Global Rural-Urban Mapping Project (GRUMP).[27] Urban extents are based on a combination of known settlement points, population counts, and the presence of nighttime lights.[27] While DHS also distinguishes between urban and rural areas, GRUMP is likely more consistent on a regional level.

GRUMP is available as a gridded dataset. For categorical rasters such as GRUMP, DHS recommends using a 5km buffer around each sampling point to reduce bias introduced by the confidentiality offset.[24] This guidance along with the high resolution (1 km) of the dataset provided the opportunity to create a third class: urban observations are where the 5-km buffer is completely within an urban extent; rural observations are completely outside urban extents, and peri-urban is where the 5-km buffer encompasses both urban and rural areas.

Climate class

The Köppen-Geiger climate classification scheme (KGCC) was used to assign each child a particular climate regime. The KGCC is built on three elements – main climate type (equatorial, arid, etc.), precipitation regime, and as relevant, temperature characteristics.[28] For the West Africa study area, there are five climate types as shown in Figure 2.2.

The KGCC dataset is available on a 0.5x0.5 degree grid.[29] For this categorical raster, if the 5-km buffer around the sampling point intersected two climate classes, the class with the majority of area was used. Because there were only 15 observations in the Fully Humid class, the Monsoonal and Fully Humid classes were combined for analysis.

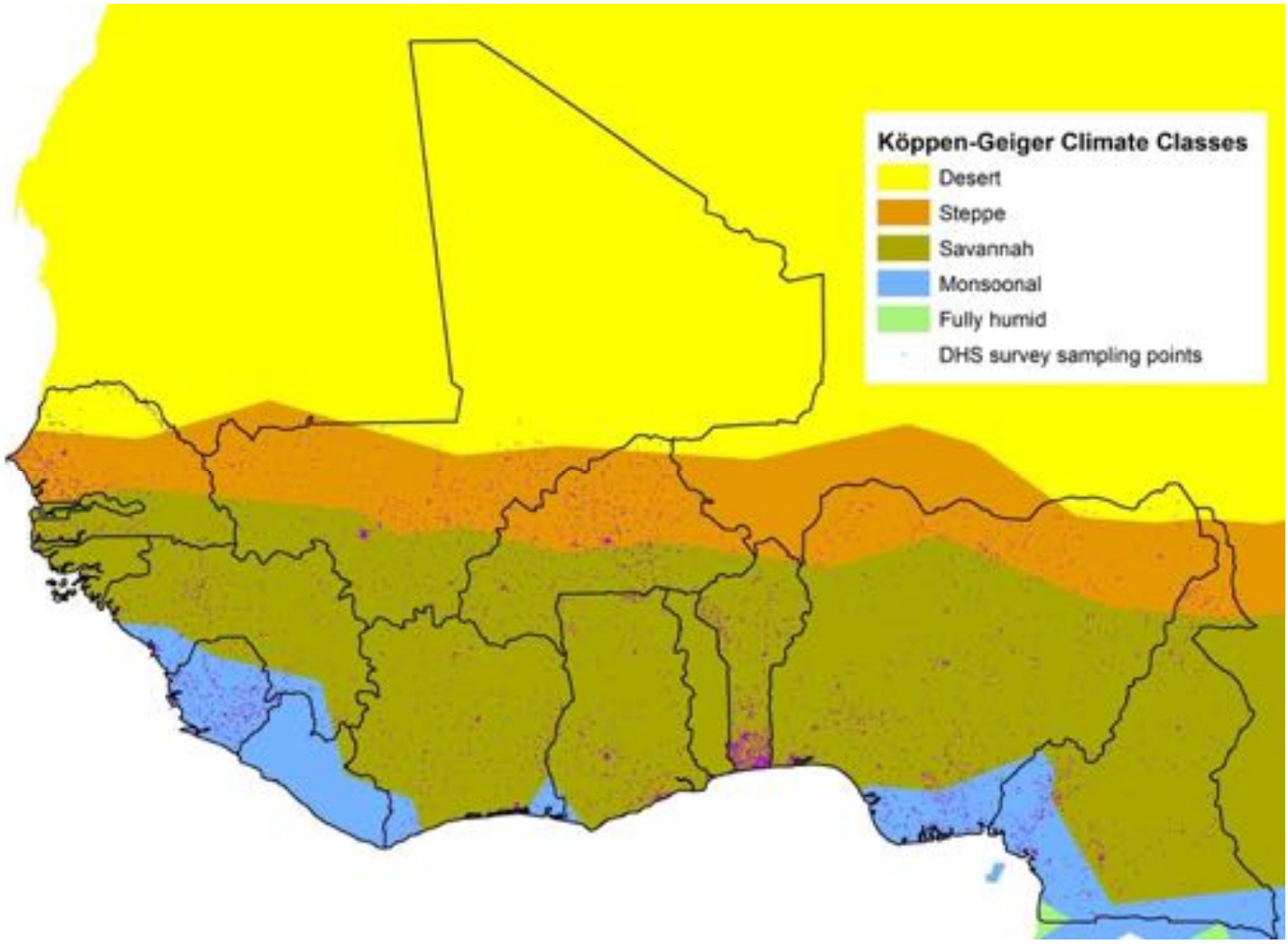

Figure 2.2: Köppen-Geiger climate classes for West Africa with locations of DHS sampling points. Names of climate classes have been abbreviated; full definitions are shown in Appendix 2.1.

Temperature

Temperature data was obtained from the Climatic Research Unit (CRU) time-series (TS) dataset version 3.22.[30] CRU TS v. 3.22 is a global dataset containing several climate variables derived from weather stations.[30] For this study, monthly mean temperature in the month of the interview was used. The data are calculated on 0.5x0.5 degree grids.[30]

For continuous rasters such as this, DHS recommends either point extraction or – for consistency with categorical rasters – a 5-km buffer.[24] Because the temperature rasters are considerably coarser than 5 km, point extraction was used.

Rainfall

Rainfall data are from TAMSAT (*T*ropical *A*pplications of *M*eteorology using *SAT*ellite data and ground-based observations) which is a product specifically for Africa.[31] Here, 10-day (dekad) estimates are used; specifically the average rainfall during the four dekads before and of the interview. TAMSAT is a high resolution (4 km) continuous raster dataset; therefore, the average rainfall within the 5-km buffer around each sampling point was used.

Analyses

Data preparation

Sample weights were normalized from the country level to the level of the study area and applied to the DHS data (calculations are shown in Appendix 2.2). These regional level weighted values are used throughout the analysis.

Voronoi polygons were generated with ArcGIS software version 10.2 from the sampling points to create a surface which aids with the visualization of patterns across the study area.[32] Each polygon defines an area of influence around its unique sampling point so that any location within the polygon is closer to that point than any other sampling point.[33]

General distribution of diarrhea prevalence

The number of children with diarrhea per number of children surveyed were mapped by Voronoi polygon to illustrate the general distribution pattern.

Covariate-adjusted cluster detection and evaluation

Statistically significant spatial clusters of diarrheal disease were detected in the study area through a spatial scan statistic, as encoded in SaTScan software version 9.4.1.[34,35] This method evaluates many possible clusters, each centered on a particular polygon and varying in size depending on the number of contiguous polygons. For each potential cluster with risk that is elevated relative to everywhere in the study area outside of the cluster, the null hypothesis is tested whereby the elevated cluster is assumed to have occurred from random chance alone. Clusters with elevated risk were identified if there was no more than a 5% chance of incorrectly rejecting the null hypothesis that the elevated risk was just from random variation ($p \leq 0.05$).

A purely spatial discrete Poisson model is used. This modeling compares the observed cases (weighted diarrhea cases aggregated to each sampling point) to the expected cases. To calculate the expected cases, logistic regression was applied at the individual level to obtain covariate-adjusted predicted values, which were then aggregated to each sampling point.

For the regression, the SAS SurveyLogistic procedure was used.[36] This incorporates the sample design into the data analysis.[36] Here, the sample strata are sub-national regions, clusters are DHS sampling points, and weight is regional weight.

Three models were developed for computing the expected number of diarrhea cases based on different sets of explanatory covariables. Model 1 provides predicted values based on household characteristics. These include household wealth and size, mother's educational attainment, the age of the child, and urban/periurban/rural designation. Model 2 is based on climatic factors including climate class, average temperature in the month of the interview, and average rainfall in the 4 dekads before and of the interview. Model 3 incorporates all the household and climatic variables.

In running the three models, the maximum cluster size was designated as up to 50% of the population at risk (the maximum), p-values were based on 999 iterations (results were the same for 9,999 iterations), and there was no geographic overlap among clusters. All the clusters with a p-value of ≤ 0.05 were mapped in ArcGIS by Voronoi polygon.

2.3 Results

The ten DHS surveys used in this study are shown in Table 2.1. Out of a total of 117,374 weighted observations, 1,563 (1.3%) were not geocoded as required for this study and were not included in further analysis. The geocoded and non-geocoded data have virtually identical diarrhea prevalence rates (p-value for two-tail t-test = 0.89). In the Burkina Faso and Sierra Leone surveys, respectively, two sampling points were coincident and therefore the data were combined, resulting in a total of 4,944 sampling points used in the analysis.

No.	Country	Survey Dates	No. of Geocoded Sampling Points	No. Mothers Interviewed	No. Children Under 5
1	**Benin**	Dec 2011 - Mar 2012	746	8,897	13,043
2	**Burkina Faso**	May 2010 - Jan 2011	543	10,042	14,698
3	**Cameroon**	Jan 2011 - Aug 2011	577	7,727	11,872
4	**Côte d'Ivoire**	Dec 2011 - May 2012	341	5,023	7,170
5	**Ghana**	Sep 2008 - Nov 2008	401	2,019	2,797
6	**Guinea**	Jun 2012 - Oct 2012	300	4,977	7,042
7	**Mali**	Nov 2012 - Feb 2013	413	6,762	10,384
8	**Nigeria**	Feb 2013 - Jun 2013	889	20,277	31,545
9	**Senegal**	Oct 2010 - Apr 2011	385	7,658	11,430
10	**Sierra Leone**	Apr 2008 - Jun 2008	351	4,116	5,831
Total			**4,946**	**77,499**	**115,811**

Table 2.1: List of ten DHS surveys used in this study with dates, number of sampling points, mothers interviewed, and children under five years old (mothers and children weighted).

Table 2.2 provides descriptive characteristics of the study population at the individual level. Any missing values are randomly distributed and no sampling point had only missing values. The mean age of the children was 29 months. Households had an average of 8 people, ranging from an average of 6 in Ghana to 14 in Senegal. The overall prevalence of diarrhea in the population was 12.8%, with the lowest rates in Benin (6.0%) and the highest in Senegal (19.6%) and Cameroon (19.1%). In rural areas, 83.8% of the population under 5 was in the lowest three wealth quintiles, while it was 35.3% in peri-urban areas, and 7.0% in urban areas. Among the mothers, 62.9% had no formal schooling; 73.2% in rural areas, 47.9% in peri-urban areas, and 31.2% in urban areas. The average number of children under 5 per mother was 1.5.

Fifty-eight percent of this population lives in the savannah climate class, while only 2% live in the true desert. Average temperature in the month of interview was normally distributed with a mean of 27.8□C. Rainfall was heavily right-skewed with more than half the children experiencing ≤ 10 mm of precipitation in the 4 dekads before and of the interview. As a group, however, these surveys do not exhibit significant "dry season bias", which can occur if fieldwork is scheduled to avoid the rainy season because travel is often difficult.[37] For these surveys, it is estimated that of 54% of fieldwork months were in the dry season against a backdrop of 48% of months of dry season overall.

At the aggregate level, in 5.4% of sampling points (Voronoi polygons), 80% or more of households are in the bottom wealth quintile, while in 44% of sampling points, 80% or more of households are in the bottom *three* wealth quintiles. In 36.7% of polygons, 80% or more of mothers have no formal education while in 59.9% of polygons, 25% or more of mothers have some education (primary, secondary, or higher). 57.4% of polygons are designated as rural, 35.1% as peri-urban, and 7.5% as urban. 16.2% of polygons are in the fully humid/monsoonal climate class, 63.9% are savannah, 18.5% steppe, and 1.6% desert.

Variable	Value	Individuals	Percent
Diarrhea			
	Yes	14,480	12.79
	No	98,760	87.21
	Missing	*2,571*	
Household wealth			
	Wealthiest	18,984	16.39
	Wealthier	22,286	19.24
	Middle	23,306	20.12
	Poor	25,211	21.77
	Poorest	26,024	22.47
Household size			
	2 to 6	54,421	47.06
	7 to 11	42,111	36.41
	12 to 16	12,606	10.90
	17 to 21	3,930	3.40
	22 to 62	2,580	2.23
	Missing	*163*	
Mother's education			
	Post-secondary	2,834	2.45
	Secondary	18,268	15.78
	Primary	21,870	18.89
	No formal education	72,831	62.89
	Missing	*7*	
Age of child (months)			
	24 to 59	68,310	58.98

	12 to 23	23,103	19.95
	6 to 11	12,451	10.75
	0 to 5	11,948	10.32
Urban / Rural			
	Rural	74,247	64.11
	Peri-urban	33,147	28.62
	Urban	8,417	7.27
Climate class			
	Fully humid/monsoonal	14,022	12.11
	Savannah	66,587	57.50
	Steppe	33,096	28.58
	Desert	2,107	1.82
Temperature (°C)			
	19 to 24.9	12,962	11.19
	25 to 30.9	89,864	77.60
	31 to 34.4	12,985	11.21
Rainfall (mm)			
	0.00	25,232	21.79
	0.01 to 10	34,518	29.81
	10.01 to 40	30,103	25.99
	40.01 to 140	25,958	22.41

Table 2.2: Characteristics of the study population at the individual level.

The overall distribution of diarrhea prevalence by Voronoi polygon is shown in Figure 2.3. Higher and lower prevalence of diarrhea are evident, both across the region and within countries. In the country with the lowest overall prevalence, Benin, 90% of the polygons have prevalence of 15% or lower, while only 10% of the polygons have prevalence rates between 15.1% and 60%. In Senegal, which has the highest overall

prevalence, the distribution is more even: 30% of polygons have prevalence rates up to 10%; 34% of polygons have rates between 10.1% and 20%, and 36% of polygons have rates between 20.1% and 58%. Nigeria provides an example of within country variation: in the North East Zone (outlined in blue), the average diarrhea prevalence is 17.8% (SD 11.1%) while in the rest of the country, rates are considerably lower with an average of 6.9% (SD 1.4%).

The prevalence of diarrhea over the entire study area is 12.8%; however, the rate in 38% of the polygons is higher than that with up to three-quarters of children afflicted. In contrast, there were no diarrhea cases in 23% of the polygons.

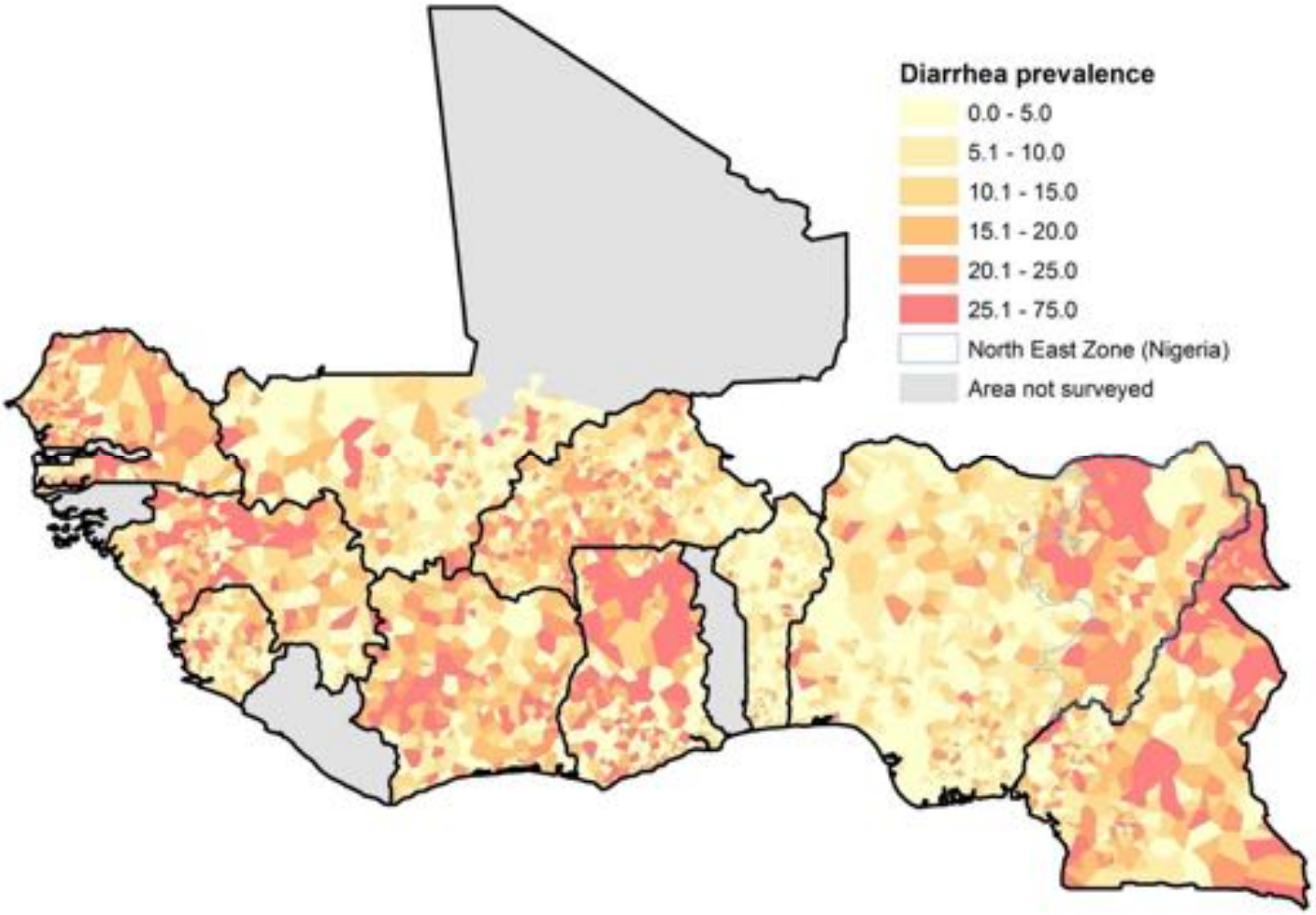

Figure 2.3: Unadjusted diarrhea prevalence by Voronoi polygons around sampling points (points not shown). The North East Zone of Nigeria is outlines as an example of intra-country variation.

The odds ratios, 95% confidence intervals, and percent concordance for the three logistic regression models used for computing expected values for the cluster analysis are shown in Table 2.3. There is a weak to moderate effect on diarrhea prevalence for all of the explanatory variables. All values except one rainfall category are statistically significant at the alpha = 0.05 level.

In Model 1 (household covariates), *ceteris paribus*, household wealth shows a dose-response association such that the odds of a diarrheal episode for children in the poorest quintile is 58% higher than for those in the wealthiest quintile. Increasing household size also steadily increases the odds of diarrhea: the odds of diarrhea for a child in a very large household are 95% higher than for those in a small-to-average-size

household. Children with mothers who had at least some primary education have the highest odds of diarrhea – over twice the odds than for children with mothers with a post-secondary education. Compared to children 24-59 months, children age 12-23 months have over twice the odds of a diarrheal episode while babies age 05 months have 14% reduced odds. The odds of diarrhea for children in urban areas are 72% higher than in rural areas and 18% higher than in peri-urban areas.

In Model 2 (climatic covariates), the odds of diarrhea increase as the general environment goes from wet to arid such that the odds in a desert setting are 80% higher than in a fully humid/monsoonal area. Increasing temperatures also increase the odds – compared to slightly cooler average temperatures, hotter temperatures increase the odds by 22%. Compared to virtually no rainfall, increased rainfall reduces the odds of diarrhea by 18%; however at still higher levels the odds of diarrhea increase again (by 13%).

In Model 3, combining all the variables does not substantially change the odds ratios for the household variables, indicating that they are independent from the climatic variables. The odds ratios for climate classes are consistently lowered (though still positive and significant), showing slight confounding from the household variables. Temperature and rainfall also act independently.

Percent concordance for Model 1, Model 2 and Model 3 is 61.7%, 50.0%, and 62.8%, respectively, demonstrating that Model 3 has a greater ability to correctly predict the model outcome (correct predictions for about 63% of the observations).

	Model 1		*Model 2*		*Model 3*	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Household wealth						
Wealthiest	1	- -			1	- -

Wealthier	1.22	1.10	1.35		1.21	1.09	1.33
Middle	1.29	1.16	1.44		1.28	1.15	1.43
Poor	1.35	1.21	1.50		1.33	1.19	1.48
Poorest	1.58	1.40	1.77		1.51	1.34	1.69
Household size							
2 to 6	1	-	-		1	-	-
7 to 11	1.17	1.11	1.23		1.16	1.10	1.23
12 to 16	1.44	1.33	1.55		1.42	1.31	1.53
17 to 21	1.73	1.51	1.97		1.67	1.46	1.91
22 to 62 (max)	1.95	1.65	2.30		1.89	1.60	2.22
Mother's education							
Post-secondary	1	-	-		1	-	-
Secondary	1.66	1.36	2.02		1.68	1.38	2.05
Primary	2.09	1.71	2.57		2.13	1.73	2.61
No formal education	1.74	1.41	2.13		1.76	1.43	2.16
Age of child (months)							
24 to 59	1	-	-		1	-	-
12 to 23	2.37	2.26	2.50		2.38	2.27	2.51
6 to 11	2.15	2.02	2.29		2.17	2.03	2.30
0 to 5	0.86	0.79	0.94		0.86	0.79	0.94
Urban / Rural							
Rural	1	-	-		1	-	-
Peri-urban	1.18	1.08	1.28		1.19	1.09	1.29
	1.72	1.44	2.05		1.82	1.53	2.16

Urban							
Climate class							
Fully humid/monsoonal		1	-	-	1	-	-
Winter dry		1.21	1.08	1.35	1.15	1.03	1.28
Arid steppe		1.46	1.27	1.67	1.27	1.11	1.44
Desert		1.80	1.40	2.31	1.57	1.22	2.02
Temperature (□C)							
19 to 24.9		1	-	-	1	-	-
25 to 30.9		1.12	1.02	1.24	1.11	1.00	1.23
31 to 34.4		1.22	1.04	1.43	1.30	1.11	1.52
Rainfall (mm)							
0.00		1	-	-	1	-	-
0.01 to 10		0.82	0.73	0.91	0.80	0.72	0.89
10.01 to 40		0.96	0.85	1.08	0.98	0.88	1.10
40.01 to 140		1.13	1.02	1.26	1.20	1.08	1.33
Percent concordance	*61.7%*		*50.0%*			*62.8%*	

Table 2.3: Odds ratios (OR), 95% confidence intervals (95% CI), and percent concordance for diarrhea in the past two weeks. Model 1 controls for household variables, Model 2 for climatic variables, and Model 3 for all covariates.

The covariate-adjusted cluster maps for the three models are shown in Figure 2.4. The shaded areas indicate statistically significant ($p \leq 0.05$) clusters of high relative risk compared to the rest of the region. Several clusters are identical, although the risk ratios are slightly different across models. These include areas in the major cities of Dakar (Senegal), Bamako (Mali), Cotonou (Benin), and Ibadan (Nigeria) as well as larger clusters in northern Cameroon and Nigeria, southern Côte d'Ivoire, and several in Nigeria. Some clusters are larger in Models 1 and 3 than in Model 2; for example, in Burkina Faso and Ghana. Guinea and Sierra Leone do not

have any clusters in Models 1 and 2, but one straddling the two countries appears in Model 3. The highest relative risks from all the models are in Dakar (7.08), Cotonou (8.11), and north and south central Nigeria (6.03-7.23).

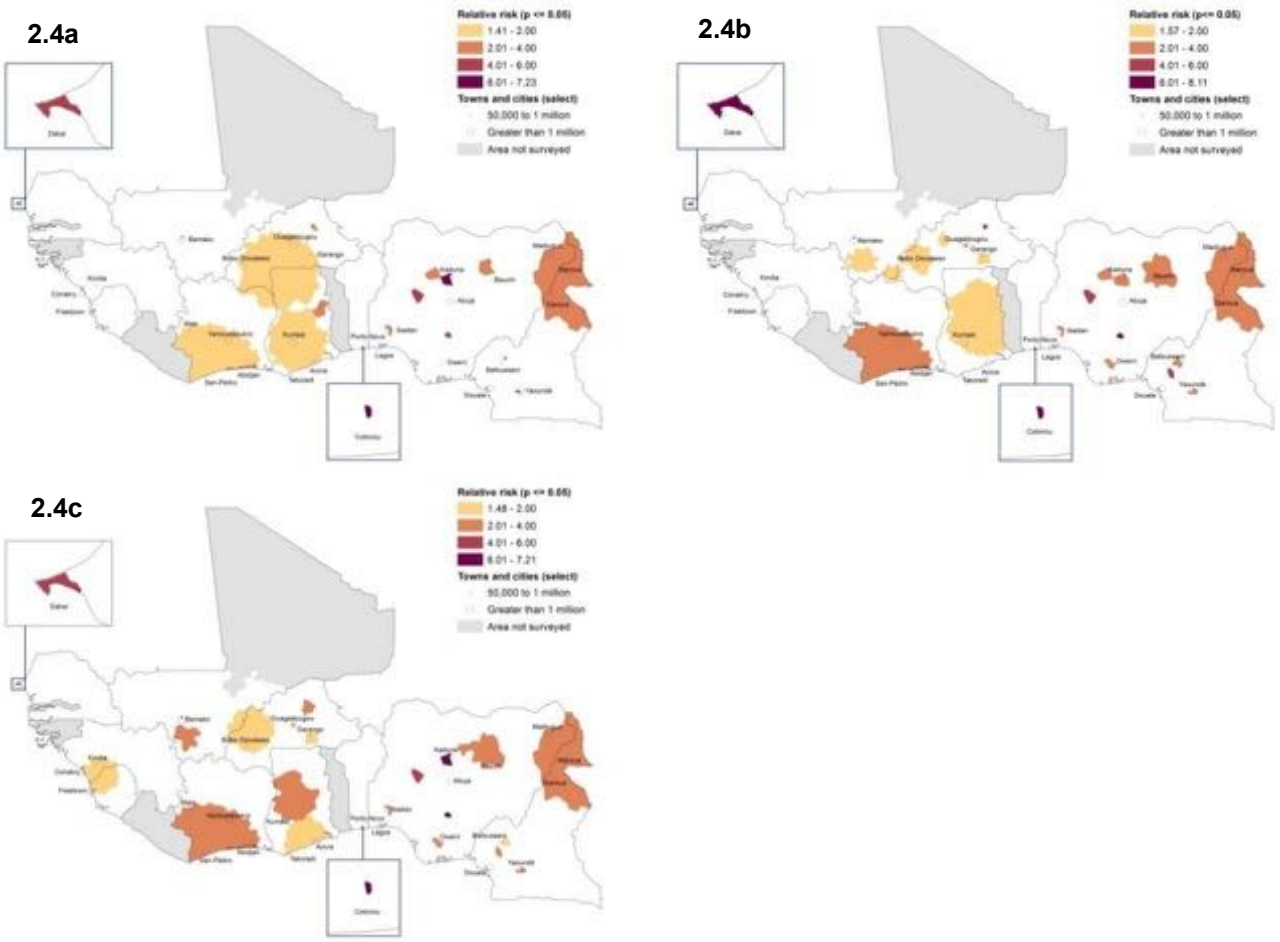

Figure 2.4: Clusters of high risk for childhood diarrheal disease controlling for (a) household characteristics, (b) climatic characteristics, and (c) household and climatic characteristics.

2.4 Discussion

This analysis first illustrates general geo-spatial patterns of diarrheal disease in West Africa without covariates and then identifies statistically significant clusters that remain after controlling for covariates to discern highrisk areas. General prevalence maps without covariates show areas of concern across the region and in particular countries, but are of limited use without adjusting for covariates or accounting for seasonal and survey method artifacts. For example, northeast Nigeria is consistently one of the most food insecure areas in West Africa, and this is reflected in the diarrhea prevalence map.[38] However, the map indicates that south

central Cameroon has a low disease burden, but the interviews in this area were conducted over 7 months from the end of the dry season to the height of the rainy season such that the effect of either season may have been cancelled by the other.

Findings from the regression modeling largely agree with previous studies. Poverty – and its links to crowding, and inadequate water, sanitation, hygiene, and housing – is well-established as a major risk factor for childhood diarrhea.[39] Linked to (but not interchangeable with) poverty is the educational attainment of the mother.[11] Worldwide, children of mothers with no education have higher rates of diarrhea than those with a secondary or higher education.[39] Here, the highest odds are for those children whose mothers have some primary education, perhaps because they are engaged in different livelihood activities that take them outside the home.

Findings in this study regarding the urban/rural divide are somewhat different than previous studies. Globally, children in rural areas have about a 10% higher prevalence of diarrhea than children in urban areas.[39] In sub-Saharan Africa, however, rapid urbanization combined with stagnant economies means that an increasing portion of urban dwellers live in slums and shantytowns.[40] Thus, the urban health advantage for children has declined in Africa as expansion of livelihood opportunities, sanitation systems, and healthcare have not kept up with urbanization rates.[40] Furthermore, urban-rural differences for childhood diarrhea and malnutrition in Africa disappear once household and community wealth are controlled.[41] In this analysis, children in urban and peri-urban areas (where slums are often located) have greater odds of diarrhea, perhaps reflecting this dynamic.

The association between the age of the child and diarrhea is similar to what is found in the literature. A worldwide study of low- and middle-income countries found incidence of diarrhea highest among children 6-

11 months and a consequent decrease toward 59 months.[12] Here, odds of diarrhea peak at 12-24 months. The youngest children (0-5 months) are protected from diarrheal pathogens as they are largely being breastfed (in this population, 96% have ever been breastfed), have limited mobility, and are under care from the mother or other household members. As babies begin to eat and drink different foods, become more mobile, and explore by putting things in their mouths, they are more exposed to pathogens and are at higher risk. The odds of diarrhea decrease after 24 months as children's immune systems develop and they gain basic hygiene skills.

In this analysis, the association between diarrheal disease and the Köppen-Geiger climate classes is statistically significant even before controlling for temperature, rainfall, or any household variables. A few health studies have used the KGCC, but a global meta-analysis found no association between diarrhea morbidity and climate class.[42] This could mean that the KGCC are more indicative at a smaller spatial scale, especially for short-term diseases such as diarrhea (compared to stunting due to chronic malnutrition, for example). In West Africa, the climate classes correlate with major livelihood activities (farming, pastoralism) which influence child nutrition and health independent of wealth or other factors.[43] Another major factor is likely a lack of access to healthcare in more remote desert areas and for transhumant populations.[44]

This research found increased odds of diarrhea associated with higher temperatures. This is consistent with the limited research in areas with climates similar to West Africa. Studies in Lima, Peru (desert climate class) and the Pacific Islands (fully humid and monsoonal) found positive associations between temperature and diarrhea hospitalizations or reports.[45-47] Again, results are more mixed outside of the tropics; a global metaanalysis found no association.[42] The mechanisms behind this association are not well-understood, but are likely linked to the biology of specific diarrheal pathogens (in West Africa, predominantly rotavirus,

enterotoxigenic *Escherichia coli*, *Shigella*, and *Cryptosporidium*) and how they survive and replicate at different temperatures.[48]

The association between rainfall and diarrheal disease does not appear to be linear, but rather u-shaped with higher risk at very low levels, lower risk at a moderate level, and higher again with very high levels. This is consistent with other short-term (weekly and monthly) studies, which find that both low and high rainfall increase diarrhea incidence.[47,49-51] Here, low rainfall implies either a normal dry season or drought conditions which can concentrate pathogens in drinking water, lead to food insecurity and malnutrition, and increase fly activity.[7,16,17] Moderate rainfall implies favorable conditions for growing crops and grazing livestock, which may improve children's nutritional status and health. Water sources are potentially plentiful, with enough recharge to dilute pathogens. Very high rainfall, however, may lead to contaminated water sources and ruin crops.[20]

The cluster analysis produced similar results for the three models, but Model 3 is the most robust and will be discussed here. Due to the spatial constraints of the data, it is not possible to fully describe the high-risk clusters; however, satellite imagery from Google Earth and anthropogenic biomes were used to further characterize them as shown in Table 2.4.[52,53] The range of increased relative risk is from 1.48 in southern Ghana to 7.21 in Kaduna, Nigeria. Ten of the 23 clusters are mostly or fully urban, indicating neighborhoods or whole cities with heightened risk. Essentially all of Dakar and Yaoundé (the largest cities in Senegal and Cameroon, respectively) have elevated risk as do parts of Bamako, Ouagadougou, Cotonou (the largest cities in Mali, Burkina Faso, and Benin), and Kaduna and Ibadan (major cities in Nigeria). Other major cities are within larger clusters, with surrounding rural areas also at elevated risk. These include Conakry, Freetown, Abidjan, Accra (the largest cities in Guinea, Sierra Leone, Côte d'Ivoire, and Ghana) and Bobo Dioulasso (Burkina Faso's

second city). However, not all major cities are at higher risk compared to the study area as a whole, including Lagos (Nigeria) - the region's megacity with 13 million inhabitants and extensive slum areas.

These clusters may have specific additional risk factors at the community level not included in the analysis. For example, the small cluster in Cotonou includes a large market and is located adjacent to a man-made canal which separates a lagoon from the ocean. This could pose risks with regards to excessive garbage and fly activity, overcrowding and insufficient public toilets, and flooding from the canal.

The other 13 clusters are largely villages surrounded by croplands (cultivated land), rangelands (land used for grazing livestock), or forests. Factors which were not included in the analysis that may contribute to elevated risk include food insecurity and inadequate healthcare. The cluster in northern Nigeria and Cameroon may be associated with conflict and drought in the area during the time of the surveys (2011-2013). In Nigeria, fighting between the radical Islamic groups Boko Haram and Ansaru and the government has severely disrupted agricultural productivity and led to food insecurity.[54] Additionally, the insurgency is marked by disruptions to the educational system, so that young mothers may have fewer resources to care for their children.[55] Also during this period, there was a drought in Cameroon, which contributed to food insecurity, reduced hygiene, and several cholera outbreaks.[56]

No.	Location	Description	Cluster Radius (km)	RR
1	Dakar (Senegal)	Urban	20	4.79
2	Southwestern Guinea and northern Sierra Leone	Villages and croplands bordered by Conakry and Freetown	117	1.98
3	Southern Cote d'Ivoire	Forests, croplands, villages, includes Abidjan and other urban centers	320	2.15
4	Bamako (Mali)	Urban and rangelands	7	5.09
5	Southern Mali	Croplands and forests	70	2.01
6	Eastern Mali and western Burkina Faso	Croplands, rangelands, villages, includes Bobo Dioulasso	142	1.49
7	Ouagadougou (Burkina Faso)	Urban and villages	9	2.29
8	Northern Burkina Faso	Rangelands	42	2.22

9	Eastern Burkina Faso	Villages, croplands, rangelands	39	1.86
10	Central Ghana	Villages and rangelands	150	2.30
11	Southern Ghana	villages, croplands, includes Accra	155	1.48
12	Cotonou (Benin)	Urban	< 1	7.16
13	Ibadan (Nigeria)	Urban, villages, croplands	14	2.85
14	Western central Nigeria	Croplands	< 1	4.91
15	Kaduna (Nigeria)	Urban	8	7.21
16	Northern central Nigeria	Croplands and villages	35	2.56
17	Northern central Nigeria	Croplands and villages	97	2.07
18	Southern central Nigeria	Village	< 1	6.03
19	Southern Nigeria	Villages	28	3.89
20	Northern Nigeria and Cameroon	Rangelands, croplands, villages, some urban centers	290	2.39
21	Western central Cameroon	Villages	27	1.80
22	Western central Cameroon	Forests	15	3.69
23	Yaoundé (Cameroon)	Urban	13	2.14

Table 2.4: Descriptions and radii of statistically significant ($p \leq 0.05$) clusters of high relative risk (RR) of diarrhea within the study area, controlling for household and climatic characteristics (Model 3).

2.5 Conclusion

In this study, the geo-spatial distribution of diarrhea in children under five years old across West Africa during the period 2008-2013 was studied in two ways. First, a prevalence map with unadjusted rates was created. Secondly, spatial clusters of diarrheal disease were detected and those with statistically significant elevated risk compared to the rest of the study area were mapped. The cluster analysis required observed cases and expected cases, which were the covariate-adjusted predicted values obtained through logistic regression.

Overall, unadjusted prevalence rates range from 0% to 75%, but with differences both between and within countries. Benin had the lowest prevalence overall (6.0%) and 90% of sampling points had a prevalence of 15% or lower. Senegal had the highest prevalence overall (19.6%) and only 45% of sampling points had a prevalence of 15% or lower. Intra-country variation is seen in the example of Nigeria, where the poorer North East Zone had unadjusted diarrhea rates of 17.8% compared to the rest of the country (6.9%).

The logistic regression analysis showed that odds of diarrhea among children were increased and significant with increased poverty, household size, among children whose mothers had little education, and among toddlers age 12 to 23 months. The child's age and the mother's education had the highest effects. Compared to children aged 24-59 months, the odds of diarrhea for children aged 12-23 months were 2.38 (95% CI 2.272.51). Compared to children whose mothers had a post-secondary education, the odds of diarrhea for children with mothers with only a primary education were 2.13 (95% CI 1.73-2.61). This indicates the importance of resources and knowledge to combat diarrheal disease; for example that a family knows the importance of clean water, can afford it, and ensures the youngest members of the household are prioritized for its use. In this analysis, children in urban areas are on average more at risk than their rural counterparts, which indicates that there is an urban disadvantage in this part of Africa. Odds of diarrhea were increased and significant as climate zones grew progressively drier, *ceteris paribus*, which speaks to the presence of other unobserved factors such as food security, in the harsh Sahelian climate. Diarrhea odds increased with increasing temperatures, perhaps a result of pathogen survival and replication. Children in environments where there was moderate rainfall had lower odds of diarrhea than those in both very dry areas and very wet areas, demonstrating how diarrhea pathogens can become concentrated with low rainfall, and can spread through water and sanitation systems with high rainfall.

After adjusting for household and climatic factors, statistically significant clusters of high relative risk compared to the rest of the study area were seen in major cities (e.g., Dakar, Yaoundé, Bamako), but not necessarily in those cities with known large wealth inequities. For example, Lagos and Douala are among the most inequitable cities in the developing world - Lagos has a Gini index of 0.64 (where 0 is perfect income distribution equality and 1 is perfect inequality) – but neither city shows particularly elevated risk of diarrhea, *ceteris paribus*.[57] This indicates that there are unobserved factors which influence whether a city is salubrious or detrimental to child health; for example, crowding or failed municipal infrastructure systems and services

(sewage, garbage collection). Other clusters are seen in largely rural areas, where children are often more exposed to unprotected water sources and food insecurity. Increased risk was greatest in urban areas (7.16 in Cotonou, Benin; 7.21 in Kaduna, Nigeria), but substantial throughout the study area (over 2 in 18 out of 23 clusters).

These results largely agree with the original hypotheses. However, the effect of temperature was stronger than anticipated, perhaps indicating the presence of particular pathogens or their concentration in water sources. Additionally, there were more clusters of elevated risk in urban areas than were expected, again speaking to the question of urban advantage as a global phenomenon.

The findings from this research support on-going development goals which aim to improve modifiable factors including increased coverage of improved water sources and sanitation facilities, increased educational attainment, and the alleviation of poverty. The results also support adaptation measures, which are aimed at factors that are difficult to change in themselves, such as living in areas where temperatures are increasing or rainfall is decreasing. Recent climate models project intense warming in West Africa; 3 to 6°C by 2099 with significant changes by 2030 in some parts of the region.[58] Inter-model variation makes rainfall more difficult to project, both in terms of magnitude and direction (drier or wetter). Areas of high risk could thus become even more vulnerable unless adaptation measures tailored for urban and rural environments and at the household and community level are taken. For example, food security for farmers and pastoralists will become even more critical, while urban dwellers will require massive infrastructure improvements.

This study has several limitations including the 5-year time period. While DHS surveys are comparable and seasonal differences are somewhat accounted for with climatic variables, the region is developing rapidly and making gains in child health such that Sierra Leone in 2008 is not truly equivalent to Nigeria in 2013. These

data are also subject to bias due to the 2-week recall period for diarrheal episodes. There are also spatial constraints with this study. Sampling points are not evenly distributed and are intentionally offset so that the Voronoi polygons are broad estimates of the location of the population of interest. A change in spatial scale – for example sub-national regions rather than Voronoi polygons around sampling points – could alter the findings (this is an example of the Modifiable Areal Unit Problem, common in spatial analysis). The climate variables are at different spatial resolutions with temperature considerably coarser than rainfall.

Future research in this area could include examining interactions between household and climatic variables and at associations between these variables at different spatial and temporal (i.e., seasonal) resolutions.

2.6 Appendices

Appendix 2.1: Definitions of Köppen-Geiger climate classes found in the study area. See Kottek et al, 2006 for more detail.[28]

Designation	Köppen-Geiger Name (Abbreviation)	Temperature	Precipitation
Desert	Arid – Desert - Hot Arid (BWh)	Annual mean near-surface temperature □ 18°C	Annual accumulated precipitation ≤ 5 x dryness threshold
Steppe	Arid – Steppe - Hot Arid (BSh)	Annual mean near-surface temperature □ 18°C	Annual accumulated precipitation > 5 x dryness threshold
Savannah	Equatorial - Winter Dry (Aw)	Monthly mean temperature of coldest month □ 18°C	Precipitation in the driest month of winter is < 60 mm
Monsoonal	Equatorial – Monsoonal (Am)	Monthly mean temperature of coldest month □ 18°C	Annual accumulated precipitation □ 25 x (100 - precipitation in the driest month)
Fully Humid	Equatorial – Fully Humid (Af)	Monthly mean temperature of coldest month □ 18°C	Precipitation in the driest month is □ 60 mm

Appendix 2.2: The calculation of regional sampling weights.

As seen in equation 1, below, the country-level sample weights are provided by DHS without decimal points and are first divided by 1,000,000. The number of women of reproductive age per country is obtained from

the World Population Prospects (2010 data used as mid-point of surveys).[59] These two numbers are multiplied to obtain an inflation factor (IF). As shown in equation 2, the average IF per country is calculated by dividing the sum of IFs per country by the number of sampling points per country. In equation 3, the regional sampling weight for each sampling point is calculated by dividing the IF from equation 1 by the average IF from equation 2. Weights are the same for every observation within a sampling point so the appropriate regional-level weight is assigned to each child. The regional sampling weight calculations are performed with all observations – geocoded or not – to preserve representativeness.

1. $$IF = \left(\frac{\text{country-level sampling weight}}{1{,}000{,}000}\right)\left(\frac{\text{no. of women age 15-49 in country}}{\text{no.of women interviewed}}\right)$$

2. $$\text{Average IF per country} = \frac{\text{sum of IFs per country}}{\text{no. of sampling points per country}}$$

3. $$\text{Regional-level sampling weight} = \frac{\text{IF}}{\text{Average IF}} \text{ for each sampling point}$$

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Map credits

Figure 2.1:

- Food and Agriculture Organization, 2006, MODIS Satellite Image mosaic 2.5d enhanced (~230 m) http://www.fao.org/geonetwork/srv/en/resources.get?id=30977&fname=af_bmng-shd.zip&access=private
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Figure 2.2:

- Rubel, F., and M. Kottek, 2010: Observed and projected climate shifts 1901-2100 depicted by world maps of the Köppen-
  Geiger climate classification. Meteorol. Z., 19, 135-141. Observed 1976-2000 http://koeppen-geiger.vuhttp://koeppen-geiger.vu-wien.ac.at/shifts.htmwien.ac.at/shifts.htm

Chapter 3. Spatially Non-Stationary Associations between Childhood Diarrhea and Socio-economic, Climatic, and Environmental Risk Factors in West Africa: A Geographically Weighted Poisson Regression Approach

Abstract

Diarrheal disease is a major contributor to child morbidity and mortality in West Africa. Global models - which use all available data to estimate one average coefficient per explanatory variable for an entire study area - indicate associations between diarrhea and socio-economic, climatic, and environmental risk factors, but cannot discern whether these relationships change depending on specific location (i.e., are spatially nonstationary). In this study, both global Poisson and Geographically Weighted Poisson regression models were applied to data from ten Demographic and Health Surveys conducted in West Africa from 2008 to 2013. Results indicate that global models mask the spatial heterogeneity in the associations between diarrhea and water source, toilet type, mother's education, population density, latitude, temperature, rainfall, and altitude. Furthermore, these covariables show associations in both positive and negative directions depending on location. In certain places (e.g., western Mali) risk associated with multiple covariates were found. This analysis serves as a preliminary step in discerning places where certain factors increase and decrease relative risk for diarrheal disease and could assist with development and adaptation strategies to improve child health.

3.1 Introduction

Despite significant progress over the past 15 years, 11% of global deaths in children under five years old are attributed to diarrheal disease, making diarrhea the second biggest killer of children after pneumonia.[1] Incidence of diarrhea is highest in Africa with an average of 3.3 episodes per child-year (uncertainty range 2.1 – 5.0) compared to the global average of 2.7 (uncertainty range 2.1 – 3.2).[2]

The risk of diarrhea in children is influenced by complex and dynamic interactions of biological, behavioral, socio-economic, and environmental factors at different levels.[3] Fundamentally, diarrhea is a "disease of poverty" and is associated with a poor home environment, undernutrition, and a lack of access to essential services.[1]

The most common transmission of diarrheal pathogens is through the fecal-oral route; therefore containing human feces such that pathogens cannot reach water sources or be transmitted by flies is a key intervention.[4] Personal hygiene, especially washing one's hands with soap, also limits the transmission of diarrheal pathogens, for example during food preparation.[4]

Factors such as temperature and rainfall influence the presence and concentration of pathogens in the environment and can compromise the integrity of water and sanitation systems. Under hot, dry conditions, pathogens can become more concentrated in unprotected water sources as evaporation increases, thereby increasing the risk of disease.[5,6] During periods of high rainfall, uncontained feces may contaminate unprotected water sources with diarrheal pathogens.[7]

In low- and middle-income countries, population density and related urban/rural classifications are associated with child health. Dense settlement is often correlated with increased wealth, improved housing and access to food, health care, and education for children and their caretakers.[8] Open defecation is also less common in dense settlements.[8] However, urban dwellers tend to rely more on municipal infrastructure such as water supply and sewage systems which are not necessarily properly installed and maintained, and can increase exposure to fecal contaminants.[9]

There are many social aspects which influence knowledge, behavior, and resources to protect children from contracting diarrhea or shortening diarrheal episodes. Examples are appropriate infant and child feeding, vaccinations, and access to quality health care for early treatment.[1] One aspect which cuts across these issues is the educational attainment of the child's mother. This is associated with the risk of diarrhea because the mother is usually responsible for the child's feeding and hygiene, and is often the child's primary, and often only, source of health care.[10,11]

The associations between the risk factors discussed above and diarrheal disease have been studied at various spatial scales and with different methods. Strina *et al.* (2003) used non-spatial statistical methods to describe the magnitude and geographical distribution of enteric disease in a Brazilian city and Chaikew *et al.* (2009) used spatial methods to detect hotpots of diarrheal disease in a province of Thailand.[12,13] A specific area of interest in the study of disease is spatial non-stationarity which is when there is geographic variation in the association between the disease outcome and an explanatory variable.[14,15] Non-stationarity may be present, but not fully recognized if the aim of a study is to produce a global model, which uses all available data to estimate one average coefficient per explanatory variable for the entire study area. For example, a study of 70 countries estimated that compared to children using only surface water, access to basic water technology such as a well lowers the odds of diarrhea by 7% across the whole area with 7% in the rural areas and 12% in the urban areas.[16] While this gives a global average and basic disaggregation of effect, it is not known how access to a well would differ among different cities or in different parts of the world.

Spatial non-stationarity has been studied with several disease outcomes, including foodborne campylobacteriosis in Tennessee with socio-economic variables and waterborne leptospirosis in Trinidad with climatic and environmental variables.[17,18] A few studies have examined the stationarity of associations between risk factors and all-cause diarrhea. Carrel *et al.* (2011), found that greater tubewell density reduces the prevalence of cholera or shigellosis in Matlab, Bangladesh and that the effect of tubewell density is stationary.[19] Leyk *et al.* (2012) examined pediatric diarrheal mortality in Brazil as a function of access to water and literacy rates and found both to be non-stationary.[15]

However, we are not aware of any research that has studied spatial non-stationarity in risk factors for diarrhea across several countries, in Africa, or with explanatory variables that include socio-economic, climatic, and

environmental characteristics together. The aim of the present research is to examine whether there are any significant spatial variations in the relationship between childhood diarrhea and key socio-economic, climatic, and environmental characteristics across West Africa in the period 2008-2013. West Africa was selected as the study area because of the high burden of diarrheal disease, the availability of survey data for ten countries within a reasonable timeframe, and because the similarities and differences across these countries create a compelling area in which to study potentially non-stationary processes. For example, while these nations face similar challenges with regards to demographic pressures such as population growth and a general lack of public services, they differ in other areas such as violence and conflict, which also effect child health.[20] There is also considerable diversity in population density and climate in the region, which stretches from the sparsely populated desert to dense equatorial cities (Figure 3.1).

It is hypothesized that in global models, risk of diarrheal disease will increase with increases in percent of population with unimproved water sources and toilet types and percent of mothers with no formal education. Risk will also increase with higher latitudes (more arid climate types), temperatures, and population densities (overall urban disadvantage) and will decrease with higher rainfall. In geographically weighted models, it is hypothesized that larger-scale factors such as latitude, altitude, and population density will have spatially stationary associations with diarrheal disease (i.e., their effect will be the same across the study area). However, rainfall and temperature associations are expected to be spatially non-stationary (for example, rainfall – and the lack thereof - will have a larger effect in dry areas than in areas of moderate precipitation). Associations between diarrhea and water source, toilet type, and mother's education will be spatially stationary within countries, but spatially non-stationary between countries (for example, the percent of mothers with no formal education will have the same effect on childhood diarrhea wherever they live within a country, but because of different development levels, the association will change from country to country).

The direction of the association for socio-economic factors such as education will be as seen in the literature (less education is associated with higher diarrhea prevalence). Other factors such as rainfall and population density will show both negative and positive associations (e.g., urban advantage and urban disadvantage).

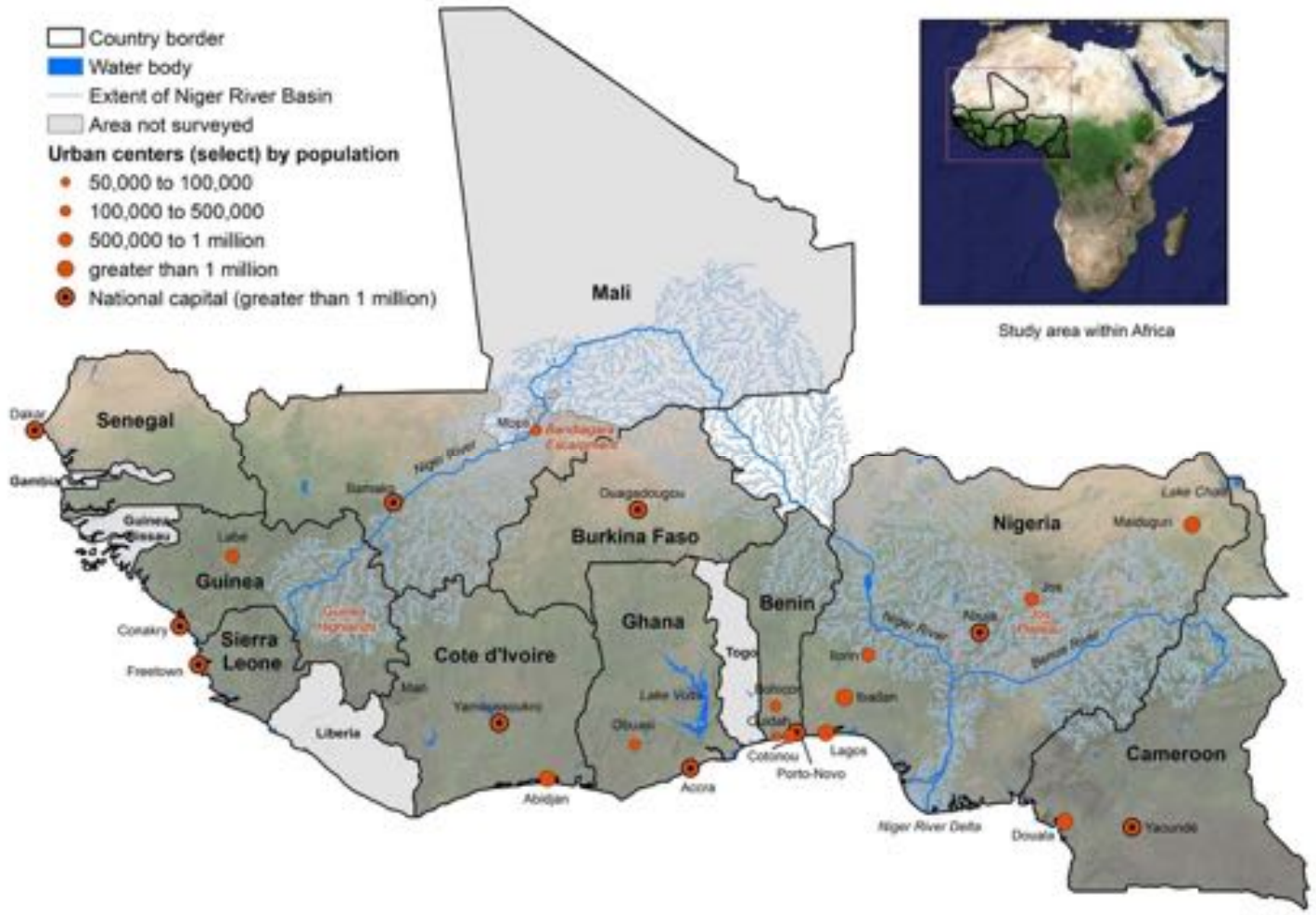


Figure 3.1: Map of the ten West African countries that make up the study area. The northern part of Mali was not included in the data source.

3.2 Methods

Data

Multiple datasets were joined for this analysis. The outcome of interest – diarrhea episodes among children under five – as well as water, sanitation, and education variables are from the Demographic and Health Surveys (DHS).[21] Climate and environmental data are derived from specialized products described below.

Demographic and Health Surveys are large, nationally representative household surveys which have been conducted in low- and middle-income countries since 1984.[21] Among the many topics covered are those related to child health; not only specific diseases, but also underlying influences such as household wealth and the vaccination status of the child. Because the surveys use similar sampling methods and questionnaires, they are considered comparable across countries and time periods.[21]

DHS uses a two-stage sampling methodology.[22] The country is first stratified by geographic (usually administrative) regions crossed with urban or rural designation.[22] In each stratum, enumeration areas determined by the most recent census are used. In the first stage, a number of primary sampling units are selected from the enumeration areas in each stratum.[22] The household lists in these areas are updated, and a fixed number of households are selected.[22] All household members within a specific group (relevant here is all women age 15-49) in the selected households are chosen for the survey.[22] Those women with children age 0-59 months are asked about the health and care of their children.[22]

Most DHS surveys are now geocoded.[21] A GPS coordinate is recorded at the approximate center of each primary sampling unit.[23] To ensure confidentiality, these sampling point coordinates are then randomly displaced 0-5 kilometers in rural areas and 0-2 kilometers in urban areas.[23] Sampling point coordinates are sometimes not collected or cannot be verified and are listed as missing.

Diarrheal disease

The outcome of interest is whether the child has had diarrhea in the past 2 weeks. Interviewers are trained to explain this means three or more loose or liquid stools per day.[24]

Water Source and Toilet Type

DHS uses the classification scheme for source of drinking water and toilet type developed by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP).[25] The type of water source serves as a proxy indicator for the quality of drinking water and toilet type is a proxy for adequately contained human excreta. The terms "improved" or "unimproved" are used to distinguish between the two classes. Improved and unimproved classes for water sources and toilet type are shown in Table 3.1. A few country-specific categories were reclassified to fit this scheme (e.g., "sachet water" was reclassified as procured from a water vendor).

	Improved	Unimproved
Water Source	- Piped into dwelling - Piped to yard/plot - Public tap/standpipe - Tube well or borehole - Protected dug well - Protected spring - Rainwater	- Tanker truck - Cart with small tank (water vendor) - Unprotected dug well - Unprotected spring - Surface water - Bottled water [a] - Other [b]
Toilet Type	- Flush or pour flush to piped sewer system - Flush or pour flush to septic tank - Flush or pour flush to pit latrine - Flush or pour flush to unknown place [d] - Ventilated Improved Pit latrine (VIP) - Pit latrine with slab - Composting toilet	- Flush or pour flush to somewhere else [c] - Pit latrine without slab/open pit - Hanging toilet/latrine - Bucket toilet - No facility/bush/stream - Other [b]

Table 3.1: Improved and unimproved sources of drinking water and toilet types. Notes from JMP[25] :

a) Bottled water is considered unimproved unless the household uses an improved water source for cooking and other domestic uses. This is not asked in DHS and bottled water was therefore assumed to be unimproved.
b) Unspecified responses of "Other" for both water source and toilet type were considered unimproved.
c) A flush system to "somewhere else" is classified as unimproved as it likely empties into a street or canal.

d) A flush system to "an unknown place" is considered improved because the household likely simply does not know whether it empties into a piped sewage system or a septic tank, both of which are improved.

Educational attainment of mother

Educational attainment is the highest level attended, but not necessarily finished. Although different countries have different educational systems, the variable has been standardized to include no formal education, primary education, secondary education, and higher than secondary education.[24]

Climate Class / Latitude

The Köppen-Geiger climate classification scheme (KGCC) is often used to differentiate between different climate types (e.g., equatorial), and temperature/precipitation regimes.[26] Here, latitude is used as a proxy for climate type as the software used for Geographically Weighted Poisson regression modelling does not accept categorical variables at present and the climate classes roughly follow a north-south pattern in West Africa (see Figure 3.5a).

Temperature

Temperature data was obtained from the Climatic Research Unit (CRU) time-series (TS) dataset version 3.22.[27] CRU TS3.22 is a global dataset containing several climate variables derived from weather stations and calculated on 0.5x0.5 degree grids.[27] The monthly mean temperature in the month before the interview and in the month of the interview were extracted for each observation.

For continuous raster datasets such as this, DHS recommends either point extraction or – for consistency with categorical rasters – a 5-km buffer.[23] Because the temperature rasters are considerably coarser than 5 km, point extraction was used.

Rainfall

Rainfall data are from TAMSAT (*T*ropical *A*pplications of *M*eteorology using *SAT*ellite data and ground-based observations), which is a product specifically for Africa.[28] Data on average rainfall over 10-day periods (dekads) were extracted for 3, 2, and 1 dekads before the interview and the dekad of the interview. TAMSAT is a high resolution (4 km) continuous raster dataset; therefore the average rainfall within the 5-km buffer around each sampling point was used.

Altitude

The altitude of sampling points is collected during DHS surveys. However, to ensure consistency across the region for this research, it was derived from the Shuttle Radar Topography Mission (SRTM) digital elevation models (DEM).[29] Due to computer processing constraints, point extraction rather than the average for the 5km buffer was used on this very high-resolution (< 100 m) dataset.

Population density

Population density was derived from the Gridded Population of the World (GPW), Population Density Grid Future Estimates for 2010 (the mid-point of the surveys).[30] The average within the 5-km buffer was used for this 2.5x2.5 degree grid.[30]

Analyses

Geographically Weighted Regression (GWR) and Geographically Weighted Poisson Regression (GWPR)

Traditional regression models assume that the processes accounting for the disease of interest are spatially stationary across the study area.[31] Geographically Weighted Regression (GWR) models test that assumption to determine a) whether associations vary in space, b) if they do vary, in what locations, and c) with what magnitude and direction. GWR produces two types of models: a global model which assumes spatial stationarity, and local regression models which are estimated at each location where observations were made. The local coefficients are estimated using spatially weighted observations in the neighborhood around the

sampling point (the "kernel"), the size of which is determined by a bandwidth measure.[15] If the spacing of points is irregular, an adaptive kernel type rather than a fixed distance type is preferred. With adaptive kernel types, the number of neighbors rather than the distance is fixed so that the area of the search window varies:

smaller where the points are close together and larger where they are far apart.[31] The selection of a bandwidth size is critical to the analysis, but difficult if done manually for an adaptive kernel. Small bandwidths may detect seemingly strong spatial variation in parameter estimates, but the estimates are not wholly reliable because of the small number of observations utilized. Large bandwidths use more observation points and are therefore more reliable, but they are also more biased as they are based on observations increasingly distant from the regression point of interest.[14]

As a count of a relatively rare event, diarrhea episodes are appropriately modeled through a Poisson regression model. The global Poisson regression model (equation 1) and geographically weighted Poisson regression model (equation 2) can be written as:

$$log\,(O_i / E_i) = \beta_0 + \sum_j \beta_j x_{ij} \qquad (1)$$

$$log\,(O_i / E_i) = \beta_{0,i} + \sum_j \beta_{ij} x_{ij} \qquad (2)$$

where O_i and E_i represent the number of observed and expected cases of childhood diarrhea, respectively, at sampling locations i =1…n and x_{ij} is the observed value of the jth covariable at location i. For the global model, E_i is treated as the offset variable and is forced to have a regression coefficient of 1. β_0 is the common intercept and β_j are linear coefficients for the j =1 … k explanatory covariables j of sampling point i. Thus x_{ij} is

the jth variable at observation *i*. For the GWPR model, the regression coefficients $\beta_{0,i}$ *and* β_{ij} are specific to each sampling point *i*, which allows for spatially varying parameters.[32]

The software GWR 4.0 (GWR4) includes three features which make it particularly useful for this study.[33] First, the selection of bandwidth size for adaptive kernels is facilitated by automated searches. In "golden section" searches, different bandwidth sizes are tested and the optimal bandwidth selected, usually determined by the AICc (small sample bias corrected Akaike Information Criterion – a measure of the relative quality of models for a specific dataset which balances the trade-offs between model fit and model complexity).[34] Second, GWR4 has the ability to fit Poisson GWR models, while other software is limited to only Gaussian models. Third, GWR4 differs from previous versions in that it can fit semi-parametric GWR models.[34] This allows the user to mix globally fixed and locally varying terms of explanatory variables in any combination in one model. The choice of which terms could be held geographically stationary is based on theory or the researcher's experience with the variable.[14]

Data preparation

To create a surface to assist with the visualization of patterns for descriptive characteristics across the study area in map form, Voronoi polygons were generated from the sampling points using ArcGIS software version 10.2.[35] Each polygon defines an area of influence (hypothetical catchment area) around its unique sampling point so that any location within the polygon is closer to that point than any other sampling point.[36]

Sample weights were normalized from the country level to the level of the study area and applied to the DHS data. These regional level weighted values are used throughout the analysis.

The data were aggregated to each sampling point with its appropriate latitude and longitude coordinates. Because variables must be continuous (i.e., not categorical) in GWR4 software, percentage for one class at a time was calculated for water source, toilet type, and educational attainment.[34] For example, the percent of mothers with no formal education is one variable and those with only a primary education is another. The other explanatory variables are continuous and are used as is.

Alternate schemes to the JMP *improved/unimproved* classes for water source and toilet type were created to test whether a different categorization better explains the associations between these variables and diarrheal disease for this particular analysis. *Untreated* water sources are surface water, unprotected and protected wells, unprotected and protected springs, and tube wells or boreholes. This is based on the hypothesis that the presence of residual chlorine from water that has presumably been treated better protects children from diarrheal pathogens all the way to point of use.[37] *Unprotected* water sources are surface water, unprotected wells, and unprotected springs. This classification aims to distinguish between the most rudimentary types of water sources and those which likely have fewer pathogens at the source and also allows for the possibility that tankered water has been treated, that water vendors use an adequate water source, and that bottled water is utilized for food preparation. *Unenclosed* flush toilet type are all JMP classes except flush or pour flush to piped sewer system or septic tank. This classification aims to separate out all but the systems which are most efficient in isolating people and vectors from fecal contaminants.

Similarly, temperature and rainfall data were summarized in various ways to test which categorization is the most relevant to diarrheal disease. For example, rainfall was averaged using different dekads to test which time period before the interview has the most effect. This is especially important because of the 2-week recall period for diarrhea episodes.

Variable selection

To select the final explanatory variables, each one was modeled in GWR4 as a univariate predictor. Those variables with the most improvement in goodness of fit between the global Poisson model and the GWPR model were selected for model building. This was determined by the difference between the global and GWR AICc within each category (e.g., rainfall). Before model building, the selected variables were checked for multicollinearity. The largest Variance Inflation Factor (VIF) was 2.07, well below the rule of thumb value of 10.[38][1]

Model building and coefficient mapping

Once the key variables were selected, six Poisson models - three of which were semi-parametric - were fitted with GWR4. Diarrhea cases were the response variable and the number of children per sampling point was the offset variable. An adaptive bi-square kernel type and golden section bandwidth search were specified. The model with the lowest AICc was determined to best explain the associations. The coefficients from a GWPR model are similar to global Poisson coefficients in that in their exponentiated form, they represent relative risk.[14] Thus, each coefficient from this final model was exponentiated and mapped (some variables were multiplied by a constant to facilitate interpretation before exponentiation). Similar to the approach introduced by Matthews and Yang (2012), only estimates with t-statistic values less than -1.645 or greater than +1.645 (indicating significance at the 0.10 level) are shown while non-significant values are masked.[39] Unlike their method, which uses one gradient from "low effect" to "high effect" without denoting that a value of 1 marks a change in direction of the association, here two gradients and a clear 1 value are used.

3.3 Results

Population description

[1] Multicollinearity was the reason why a measure of wealth was not included in this study. DHS uses a Wealth Index, which comprises several variables, including water source and toilet type. As the non-stationarity of water and sanitation variables is of particular interest to diarrheal disease, they are studied instead of wealth.

The ten DHS surveys used in this study are shown in Table 3.2. Out of a total of 117,755 observations, 1,704 (1.4%) were not geocoded as required for this study and were not included in further analysis. The geocoded and non-geocoded data have virtually identical diarrhea prevalence rates (p-value for two-tail t-test = 0.998). In Ghana, one sampling point (one mother with one child) had all missing data for key water and sanitation variables and was dropped. In the Burkina Faso and Sierra Leone surveys, respectively, two sampling points were coincident and therefore the data was combined. Thus the total number of points used in the analysis is 4,943.

No.	Country	Survey Dates	No. of Geocoded Sampling Points	No. Mothers Interviewed	No. Children Under 5
1	**Benin**	Dec 2011 - Mar 2012	746	8,897	13,043
2	**Burkina Faso**	May 2010 - Jan 2011	543	10,042	14,698
3	**Cameroon**	Jan 2011 - Aug 2011	577	7,727	11,872
4	**Côte d'Ivoire**	Dec 2011 - May 2012	341	5,023	7,170
5	**Ghana**	Sep 2008 - Nov 2008	400	2,018	2,796
6	**Guinea**	Jun 2012 - Oct 2012	300	4,977	7,042
7	**Mali**	Nov 2012 - Feb 2013	413	6,762	10,384
8	**Nigeria**	Feb 2013 - Jun 2013	889	20,277	31,545
9	**Senegal**	Oct 2010 - Apr 2011	385	7,658	11,430
10	**Sierra Leone**	Apr 2008 - Jun 2008	351	4,116	5,831
Total			**4,945**	**77,498**	**115,810**

Table 3.2: List of ten DHS surveys used in this study with dates, number of sampling points, mothers interviewed, and children under five years old (mothers and children weighted).

Descriptive statistics for the study population at the individual level are shown in Table 3.3. Across the study area, diarrheal prevalence is 13%. While 67% of households have an improved water source, only 43% have an improved toilet. In urban areas (DHS classification), 85% of the households use an improved water source and 76% use an improved toilet. In rural areas, it is 58% and 27%, respectively. Sixty three percent of mothers have no formal education.

About 11% of the study households live in the humid lowest latitudes and 2% in the northern desert areas, with the rest in the mid-latitude savannah and steppe areas. Temperature is normally distributed with an average of 27.8□C in the month before and the month of the interview. Rainfall is positively skewed with over 58% of the children experiencing an average of less than 15 mm of rain in the 4 dekads before and of the interview. Nearly ¾ of the children live at altitudes between 25 and 500 meters, with 14% below that (nearly all coastal), and 12% at higher altitudes. Despite rapid urbanization, West Africa is still largely rural with a weighted average population density of 23 people/km^2. Only 5% of children in these surveys live in areas with population densities of 5,000 people/km^2 or more.

Variable	Value	Individuals	Percent
Diarrhea			
	Yes	14,480	12.79
	No	98,759	87.21
	Missing	*2,571*	
Water Source			
Improved	Piped into dwelling	7,068	66.58
	Piped to yard/plot	6,863	
	Public tap/standpipe	16,939	
	Tube well or borehole	30,563	
	Protected dug well	13,190	
	Protected spring	1,184	
	Rainwater	262	
Unimproved	Tanker truck	304	33.42
	Cart with small tank (water vendor)	1,648	
	Unprotected dug well	20,809	
	Unprotected spring	4,123	
	Surface water	10,638	
	Bottled water	300	
	Other	358	
	Missing	*1,561*	
Toilet type			
Improved	Flush or pour flush to piped sewer system	2,666	43.17
	Flush or pour flush to septic tank	7,350	
	Flush or pour flush to pit latrine	2,965	
	Flush or pour flush to unknown place	35	
	Ventilated Improved Pit latrine (VIP)	10,875	
	Pit latrine with slab	25,279	
	Composting toilet	150	
	Flush or pour flush to somewhere else	108	
	Pit latrine without slab/open pit	26,771	

Unimproved	Hanging toilet/latrine	863	56.83
	Bucket toilet	64	
	No facility/bush/stream	37,048	
	Other	73	
	Missing	1,563	
Mother's education			
	No formal education	72,831	62.89
	Primary	21,870	18.89
	Secondary	18,267	15.77
	Post-secondary	2,834	2.45
	Missing	*7*	
Latitude (°N)			
	2.0 - 5.9	12,906	11.14
	6.0 - 9.9	41,263	35.63
	10.0 - 14.9	58,934	50.89
	15.0 - 16.9	2,708	2.34
Temperature (°C) - mean in month before and of interview			
	20.0 - 26.9	37,688	32.54
	27.0 - 28.9	48,759	42.10
	29.0 - 34.6	29,363	25.35
Rainfall (mm) – mean in 4 dekads before and of interview			
	0.0 - 14.9	67,746	58.50
	15.0 - 44.9	24,883	21.49
	45.0 - 131.0	23,181	20.02
Altitude (m)			
	0.0 - 24.9	16,302	14.08
	25.0 - 499.9	85,437	73.77
	500.0 - 999.9	10,942	9.45
	1,000.0 - 2,744.0	3,128	2.70
Population Density (people/km^2)			
	0.0 - 49.9	29,904	25.82
	50.0 - 99.9	24,259	20.95
	100.0 - 499.9	40,646	35.10
	500.0 - 25,131.0	21,002	18.13

Table 3.3: Characteristics of the study population at the individual level.

Variable selection

Table 3.4 shows the results of the variable selection. Asterisks (*) mark those variables with the biggest difference between global AICc and GWR AICc (Diff. AICc). As expected with these data, the GWPR model is an improvement in all cases. The only variable category with two possibilities of aggregation is rainfall, where

sum and average over the 4-dekad period give similar differences of AICc (the rule of thumb is that if the difference in AICc values between two models is less than or equal to 2, there is no real difference in the performance of the models).[14] Average rainfall was selected as it is more intuitive and comparable to average temperature.

The percent deviance explained in GWPR is a measure of local goodness-of-fit and is a type of pseudo-R^2.[34] Bandwidth is the number of sampling points included in the kernel as determined by the golden section search.

	Variable	Diff. AICc	% Deviance Explained GWPR	Bandwidth
Water source (%)				
*	Unimproved, JMP classification	3,961	0.449	45
	Untreated	3,078	0.288	231
	Unprotected	3,167	0.287	231
Toilet type (%)				
*	Unimproved, JMP classification	4,202	0.457	44
	Unenclosed flush toilet type	3,109	0.280	231
Mother's education (%)				
*	No formal education	3,925	0.444	44
	No formal or only primary education	3,810	0.443	45
Latitude (°N)				
*	Latitude	3,975	0.422	44
Temperature (°C)				
	Avg. in month before interview	3,252	0.296	232
	Avg. in month of interview	3,287	0.296	231
*	Avg. in month before and month of interview (mean)	3,296	0.298	231
Rainfall (mm)				
	Avg. 3 dekads before interview	3,226	0.292	254
	Avg. 2 dekads before interview	3,273	0.298	231
	Avg. 1 dekad before interview	3,342	0.300	231
	Avg. in dekad of the interview	3,023	0.265	399

	Avg. in 4 dekads before and of interview (mean)	3,405	0.307	232
*	Avg. in 3 dekads before and of interview (mean)	3,341	0.299	254
	Avg. in 2 dekads before and of interview (mean)	3,343	0.298	254
	Sum in 4 dekads before and of interview	3,403	0.307	231
	Sum in 3 dekads before and of interview	3,407	0.307	231
	Sum in 2 dekads before and of interview	3,339	0.298	254
Altitude (m)				
*	Altitude	3,934	0.431	44
Population density (people/km^2)				
*	Population density	3,150	0.285	231

Table 3.4: Variable selection. Diff. AICc is the difference in AICc between the global Poisson model and the GWPR model. % Deviance Explained GWPR is a pseudo-R^2 measure and bandwidth is the number of sampling points included in the kernel as determined by the golden section search.

Model building

Model building and model results are shown in Table 3.5 and Table 3.6. In Models 1-3, all terms are allowed to vary locally. Model 1 used all eight variables selected above. Because population density may have a nonlinear threshold effect where outcome changes after a critical level of density, population density and population density squared were tested in Model 2. Next, an interaction term for rainfall and temperature was tested in Model 3. Not shown are several other combinations of locally varying terms, none of which performed as well as Model 1.

In Models 4-6, the hitherto best model (Model 1) was altered such that one term was globally fixed. The three variables tested were population density, latitude, and altitude, the hypothesis being that these variables are relatively invariable across the study area and thus may influence childhood diarrhea in similar ways.

As seen in Table 3.6, the Model 1 remained the best-performing with all locally varying terms.

Model	Variables Included in Model

	Water	Toilet	Educ.	Lat.	Temp.	Rain	Alt.	Pop. Dens.	Pop. Dens. Sq.	Temp. Rain Int.
1) Eight Local	L	L	L	L	L	L	L	L		
2) Nine Local – PD PD^2	L	L	L	L	L	L	L	L	L	
3) Seven Local - Rain Temp Int	L	L	L	L			L	L		L
4) Seven Local - PD Global	L	L	L	L	L	L	L	G		
5) Seven Local - Lat Global	L	L	L	G	L	L	L	L		
6) Seven Local - Alt Global	L	L	L	L	L	L	G	L		

Table 3.5: Variables used in model building, showing whether terms were globally fixed (G) or locally varying (L).

Model	AICc				Bandwidth
	Global	GWR	Difference	Diff. Best	
1) Eight Local	11,587	8,021	3,566	*Referent*	248
2) Nine Local – PD PD^2	11,587	9,382	2,205	1,361	1,664
3) Seven Local - Rain Temp Int	11,677	8,097	3,580	75	242
4) Seven Local - PD Global	11,587	8,032	3,554	11	248
5) Seven Local - Lat Global	11,587	8,102	3,485	81	248
6) Seven Local - Alt Global	11,587	8,084	3,503	63	248

Table 3.6: Model results. Diff. Best is the difference in between the best performing model (Model 1) and the others.

Final model summary

The global Poisson regression results for Model 1 – the best performing model - are shown in Table 3.7.

When using all available data to estimate one average coefficient per explanatory variable for the entire study area, water source is not significant at the 0.10 level, toilet type is not significant at the 0.05 level, and all the other variables show high significance. A slight positive association is seen with water source, latitude, rainfall, altitude, and population density. Slight negative associations are seen with toilet type, mother's education, and temperature. The results for the GWPR for Model 1 are shown in Table 3.8 with the ranges of relative risk according to location, along with the percent of sampling points (n=4,943) which show significance (t-statistic less than -1.645 or greater than 1.645) for each covariate.

Variable	Relative Risk	P-value
Intercept	0.1496	0.0000
Unimproved water source (% households)	1.0003	0.2510
Unimproved toilet type (% households)	0.9995	0.0560
No formal education (% mothers)	0.9992	0.0120

Latitude	1.0397	0.0000
Temperature	0.9830	0.0000
Rainfall	1.0023	0.0000
Altitude	1.0001	0.0250
Population density	1.0000	0.0000

Table 3.7: Global Poisson regression results (Model 1) with relative risks and p-values.

Variable	Range of Relative Risk	% of sampling points significant
Unimproved water source *(per 10% increase)*	0.93 – 1.11	28%
Unimproved toilet type *(per 10% increase)*	0.84 – 1.10	31%
No formal education *(per 10% increase)*	0.78 – 1.14	30%
Latitude *(per 1-degree increase)*	0.02 – 15.06	48%
Temperature *(per 1-degree increase)*	0.28 – 1.83	36%
Rainfall *(per 10-mm increase)*	0.43 – 41.30	64%
Altitude *(per 100-m increase)*	0.33 – 2.80	32%
Population density *(per 100-pp/km2 increase)*	0.65 – 1.68	37%

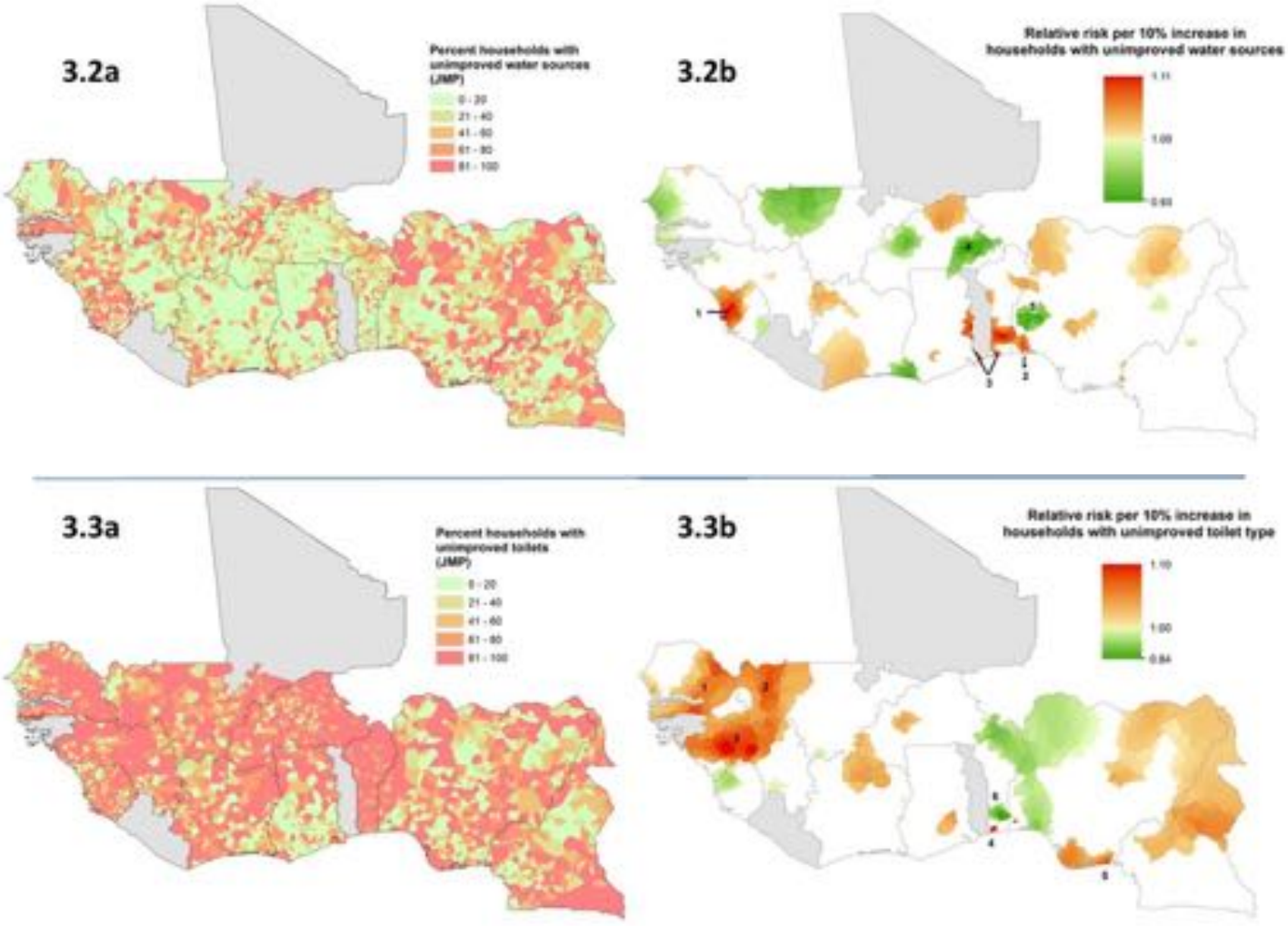
Table 3.8: Geographically Weighted Poisson regression results (Model 1) with range of relative risk and percent of significant sampling points (n = 4,943).

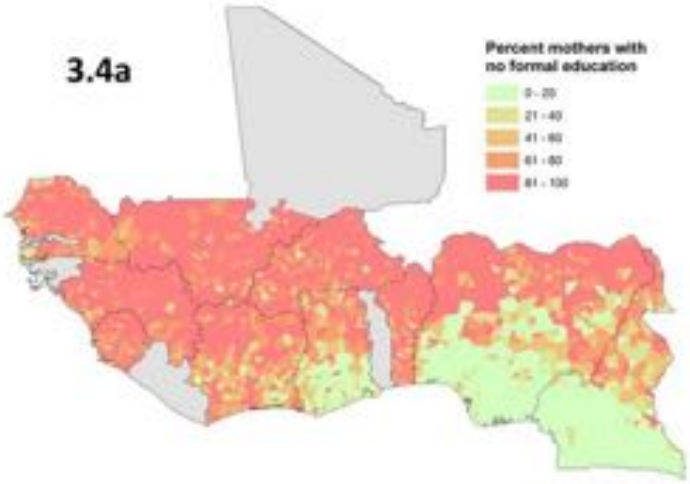
Following Fotheringham (2002), the formal test for non-stationarity is if the interquartile range (Q3-Q1) of the local regression coefficient is larger than twice the standard error of the global regression coefficient.[31] As seen in Table 3.9, all variables show non-stationarity.

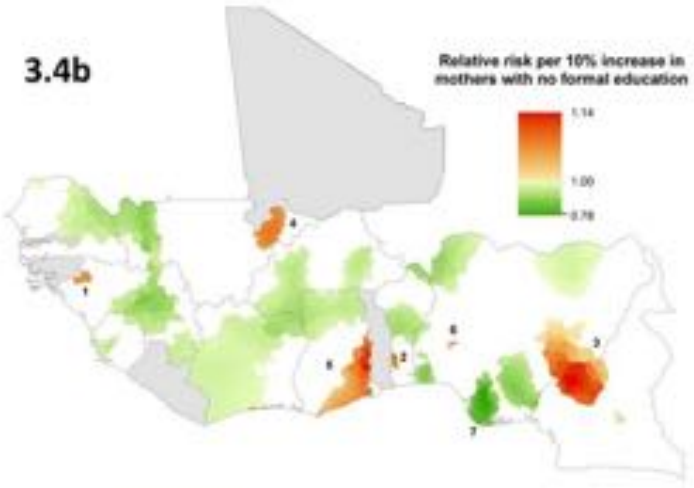
Variable	Min	Max	Q1	Median	Q3	Status
Intercept	-21.308	37.931	-3.67717	-1.05873	1.48906	non-stationary
Unimproved water source (% households)	-0.008	0.011	-0.00178	0.00012	0.00234	non-stationary
Unimproved toilet type (% households)	-0.018	0.010	-0.00127	0.00091	0.00276	non-stationary
No formal education (% mothers)	-0.025	0.013	-0.00496	-0.00147	0.00174	non-stationary
Latitude	-3.800	2.712	-0.22052	-0.03132	0.12755	non-stationary
Temperature	-1.279	0.605	-0.07624	-0.00112	0.05676	non-stationary
Rainfall	-0.083	0.372	-0.01027	-0.00144	0.00655	non-stationary
Altitude	-0.011	0.010	-0.00090	0.00003	0.00089	non-stationary
Population density	-0.004	0.005	-0.00025	-0.00002	0.00007	non-stationary

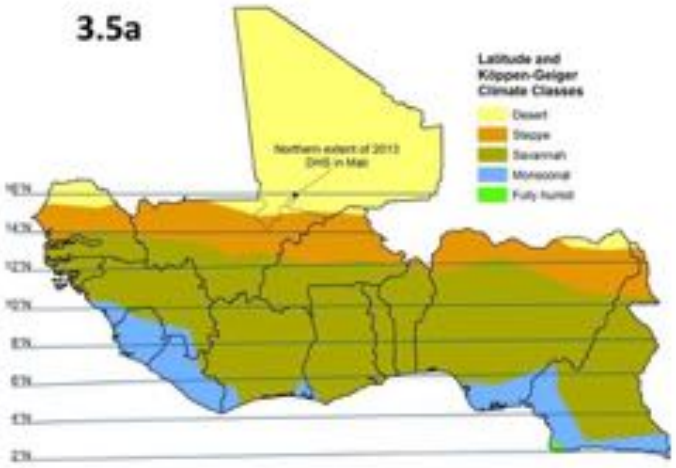
Table 3.9: Stationarity test for Geographically Weighted Poisson regression results (Model 1).

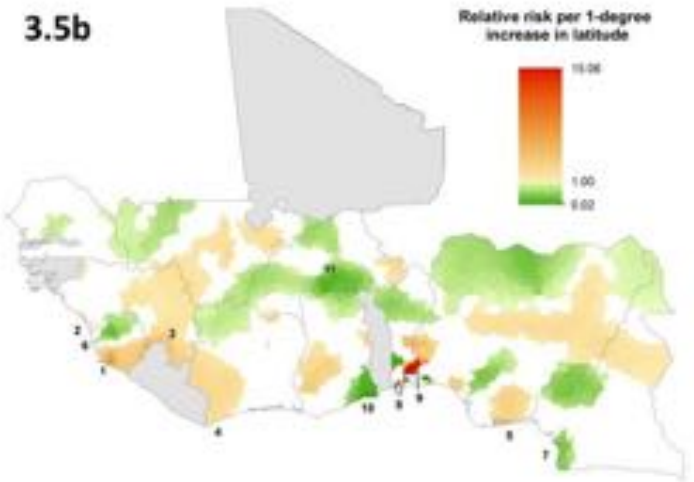
The mapped exponentiated GWPR coefficients (relative risk values) are shown next to maps of their respective descriptive variables in Figures 3.2 through 3.9. Numbers in the (b) panels refer to the section "individual variables", below. Only the areas which show significant results (t-statistic values less than -1.645 or greater than +1.645) are shown while non-significant values are masked in white.

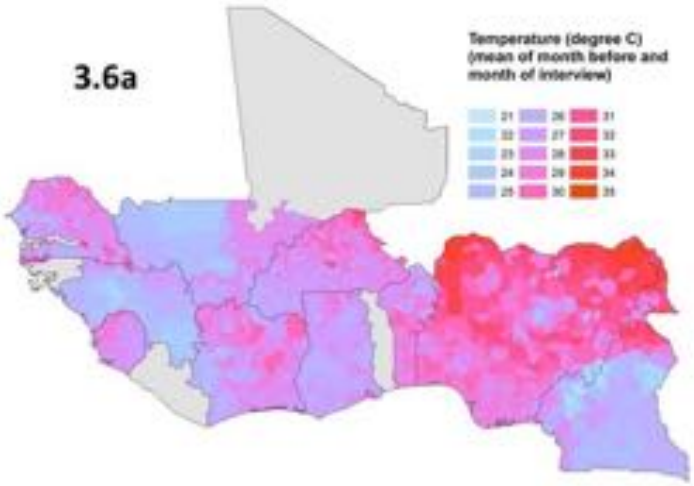


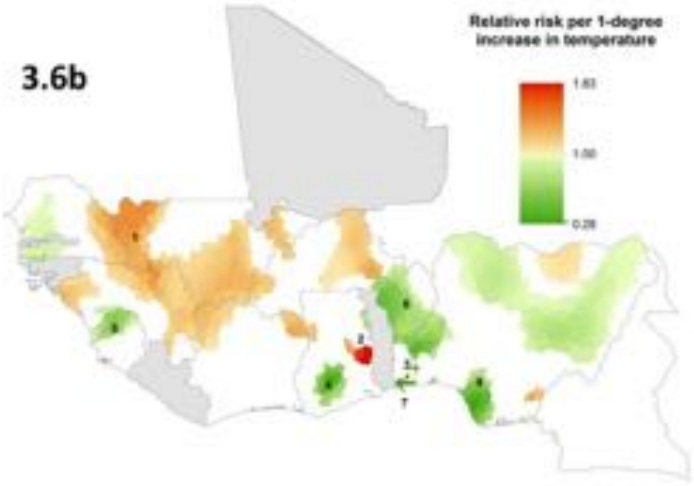

3.4a
Percent mothers with no formal education
0 - 20
21 - 40
41 - 60
61 - 80
81 - 100

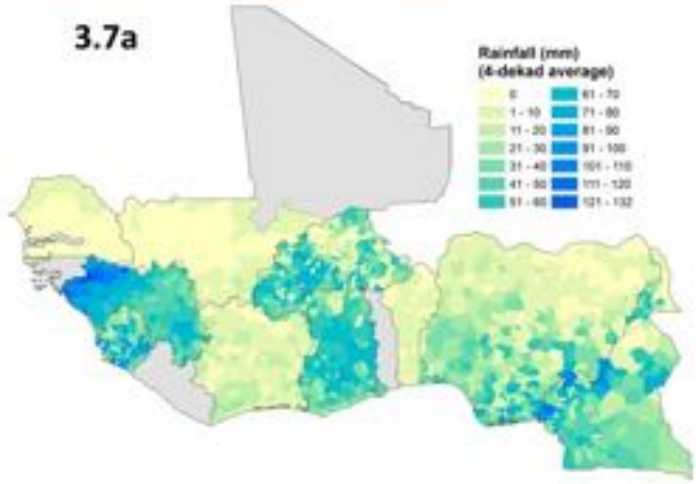

3.4b
Relative risk per 10% increase in mothers with no formal education
1.14
1.00
0.78

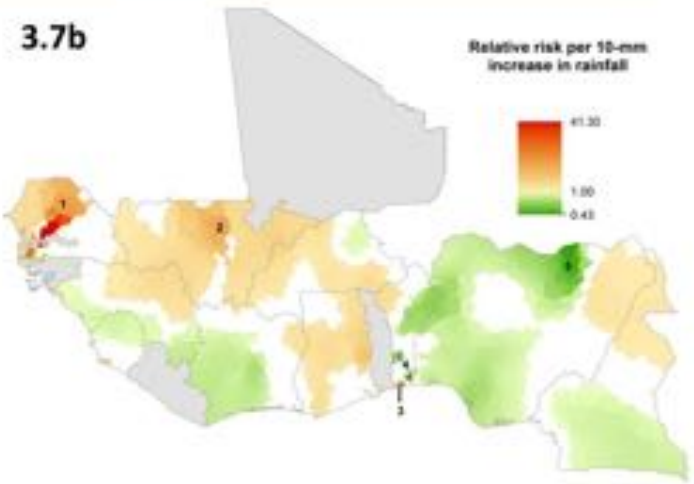

3.5a
Latitude and Köppen-Geiger Climate Classes
Desert
Steppe
Savannah
Monsoonal
Fully humid
Northern extent of 2013 DHS in Mali


3.5b
Relative risk per 1-degree increase in latitude
15.06
1.00
0.02


3.6a
Temperature (degree C)
(mean of month before and
month of interview)


3.6b
Relative risk per 1-degree
increase in temperature


3.7a
Rainfall (mm)
(4-dekad average)


3.7b
Relative risk per 10-mm
increase in rainfall

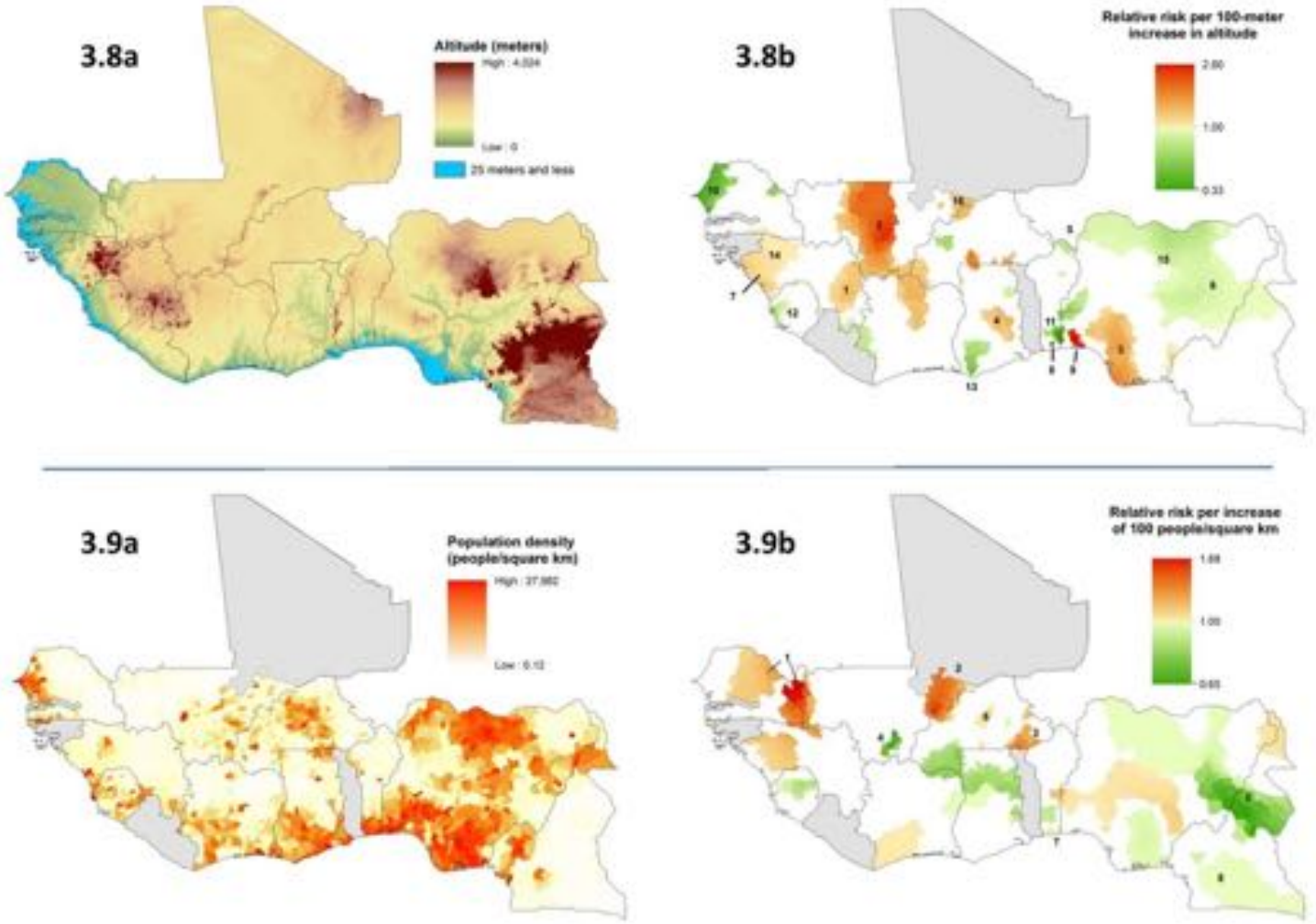


Figure 3.2 - Figure 3.9: Maps of descriptive variables (a) and GWPR coefficients (b). Numbers in (b) maps refer to the "individual variables" section, below. Gray areas were not surveyed.

Individual variables

Refer to Figures 3.2 – 3.9:

<u>Percent of households with unimproved water source</u>

Region-wide, about 33% of households have unimproved water sources. Rates of unimproved water sources are varied throughout individual countries, but in general, the proportion is higher in more sparsely populated areas.

Several major urban centers show positive associations between the percent of unimproved water sources and diarrheal disease. Coastal Sierra Leone and Guinea (1) including Freetown and Conakry have increased

risk, as does Lagos and its northern extent (2) where 44% of households have unimproved water sources. Other higher risk areas are rural mixed with more densely populated towns; for example, southern Benin and western Ghana (3). The strongest negative associations (decreased risk) are seen in eastern Burkina Faso (4) and central west Nigeria (5).

The range of relative risk for water source was 0.93 to 1.11 and the coefficient was significant in 28% of the sampling points – the lowest of all the variables.

Percent of households with unimproved toilet type

About 57% of households in the study area have unimproved toilet types. As with water source, in general, rates are varied throughout particular countries. However, the overall proportion of unimproved toilets is higher and more urban residents are without improved toilets than without improved water sources.

The strongest positive associations between the proportion of unimproved toilets and diarrheal disease are in sparsely populated central Senegal (1) and western Mali (2). Increased risk is also seen in central Guinea (3), western Benin (4), and the eastern Niger River Delta area (5) which is a mix of villages and towns. The strongest negative association is in southern Benin (6).

The range of relative risk for toilet type is similar to water source: 0.84 to 1.10 with significance in 31% of the sampling points.

Percent of mothers with no formal education

Region-wide, about 63% of mothers surveyed had no formal education. In Ghana, Nigeria, and Cameroon, there is a distinct north/south divide. In Ghana, about 15% of mothers had no formal education in the south versus

71% in north. In Nigeria, the difference is 10% versus 69%, and in Cameroon, it is 4% in the south and 63% in the north.

The proportion of mothers without formal education and diarrheal disease are positively associated in more sparsely populated areas of Guinea (1) and Benin (2) where there are high rates of no education. In Cameroon and Nigeria (3), the area of higher risk is also relatively sparsely populated, but with more of a mix between higher and lower rates of no education. A third pattern is seen in Mali (4), Ghana (5), and western Nigeria (6). In these areas of high positive association, there is a major city (Mopti, Accra, and Ilorin, respectively) with relatively low rates of no education, surrounded by rural areas with high rates of no education. Negative associations are also seen for education, most strongly in the Niger River Delta area (7).

Relative risk for mother's education ranges from 0.78 to 1.14 with significance in 30% of sampling points.

Latitude / Climate Class

In the fully humid/monsoonal climate class, higher risk of diarrhea is seen most strongly in Sierra Leone (1), but also in coastal and inland Guinea (2-3), western Côte d'Ivoire (4), and the eastern Niger River Delta (5). The northern part of Sierra Leone (6) and southern part of Cameroon (7) show negative associations, while in southeastern Côte d'Ivoire, there is no statistically significant association.

In the savannah climate class, the areas with the strongest positive associations are in southern and eastern Benin (8) and western Nigeria (9). There were both positive and negative associations throughout the northern savannah and steppe climate classes. The strongest negative associations are in southeast Ghana (10) and southern Burkina Faso (11). In the small desert section of the study area, there were no statistically significant effects.

The range of relative risk for latitude is 0.02 to 15.06 with significance in 48% of sampling points.

Temperature

The strongest positive associations between temperature and diarrheal disease are in western Mali (1) where conditions were cool and dry; eastern Ghana (2), which was cool and wet; and southern Benin (3) where it was warm and dry.

Decreased risk was strongest in central south Ghana (4) which was cool with moderate rain or warm with heavy rain; northern Sierra Leone (5) where it was warm with heavy rain or hot with moderate rain; central and southern Benin (6-7) where conditions were warm or hot and dry; and the western Niger River Delta (8) which was warm to hot with moderate to heavy rain.

Temperature was significant in 36% of the sampling points and had a relative risk range of 0.28 to 1.83.

Rainfall

The strongest positive associations between rainfall and diarrheal disease were in central Senegal (1), central Mali (2), and southwestern Benin (3) where conditions were dry with cool to hot temperatures. Negative associations are strongest in south central Benin (4), which was dry with warm to hot temperatures and northern Nigeria (5), which was dry and hot.

Rainfall showed statistical significance for 64% of the sampling points and a range of relative risk from 0.43 to 41.30. These are the highest percent significant and largest range in the study.

Altitude

Positive associations for altitude are seen in the Guinea Highlands (1), central Mali (2), and the Niger River Delta in Nigeria (3). The Lake Volta region of Ghana (4) also shows positive associations. There are negative associations in Benin and Nigeria (5) and along eastern Nigeria (6).

The low elevation coastal areas show both positive and negative associations. There are weak positive associations in coastal Guinea (7) and stronger associations in a small area of southern Benin (8) and in Lagos (9). The Niger River Delta (3) also has positive associations.

Negative associations along the coast are in western Senegal (including Dakar), eastern Benin (10-11), Sierra Leone (including Freetown), and western Ghana (12-13).

The areas of highest altitude in the region show associations in different direction; slightly positive in northern Guinea (14) and negative at the lower elevations of the Jos Plateau in Nigeria (15). Unlike these two places, which have significant populations, the highlands of Cameroon are sparsely populated and show no association between from altitude and diarrheal disease. The Bangiagara Escarpment in Mali (16) also shows increased risk.

The range of relative risk for altitude is 0.33 to 2.80 with significance in 32% of the sampling points.

Population Density

The strongest positive associations between population density and diarrheal disease are mostly in sparsely populated areas such as in eastern and central Senegal and western Mali (1), the Bangiagara Escarpment in

eastern Mali (2), and eastern Burkina Faso (3). The strongest negative associations are in sparsely populated areas in southern Mali (4) and Cameroon and Nigeria (5).

Of the largest cities in the study area, weak positive associations are found in Ouagadougou (6) and Cotonou (7) and a weak negative association in and around Yaoundé (8). Nigeria has many more large cities than the rest of the region, but there is a general pattern of weak negative associations in the north, weak positive in the slightly less populated middle belt, and negative again in parts of the south. Lagos does not demonstrate any significant associations.

Population density is significant in 37% of the sampling points with a relative risk range of 0.65 to 1.68.

Areas with multiple risk factors

Temperature and rainfall

Temperature and rainfall are both positively associated with diarrheal disease across Mali and northern Guinea, as well as in smaller areas of eastern Burkina Faso, and central Ghana and Côte d'Ivoire.

In small areas of central Senegal, central Ghana, northern Benin, and northern Nigeria, there is increased risk for rain, and decreased risk for temperature. Positive associations for temperature and negative for rain are seen in western Guinea, northern Côte d'Ivoire, and northern Burkina Faso and Nigeria.

Latitude/climate class, temperature, and rainfall

In the fully humid/monsoonal climate classes with a positive association for diarrheal disease (Sierra Leone, Guinea, Côte d'Ivoire, Niger River Delta), there was moderate to heavy rainfall with warm temperatures.

These were also the conditions in northern Sierra Leone and Cameroon where there was a negative association. In the monsoonal area of southeast Côte d'Ivoire, there is no statistically significant effect and conditions were dry or with moderate rain.

In the savannah climate class, the areas with the strongest positive associations for latitude are in southern and eastern Benin where conditions were hot and dry, and in western Nigeria, where it was hot with moderate rain.

Water source and toilet type

There are a few areas which show increased risk for diarrhea associated with both percent of households with unimproved water source and toilet type, the largest of which is in northeastern Nigeria. Others include southwest Benin and central Guinea. In western Senegal (including Dakar), northwestern Mali, central eastern Burkina Faso, northwestern Nigeria, and western Guinea there are positive associations for toilet type, but negative for water source. The opposite is the case for parts of northern Benin and Nigeria, southern Benin, and western Sierra Leone and Guinea (including Freetown and Conakry), which have positive associations for water source, but negative for toilet type.

Temperature and water source or toilet type

There are also a few small areas with positive associations for both percent of households with unimproved water source and temperature including northern Nigeria, northern Burkina Faso and northwestern Côte d'Ivoire, which were all experiencing warm-to-hot temperatures. In east central Ghana, temperatures were cool.

Areas with positive associations for diarrheal disease and both unimproved toilet type and temperature include eastern Senegal, western Mali, northern Guinea, western Guinea, western Burkina Faso, and north central Nigeria, which run from cool to hot temperatures.

Rainfall and water source or toilet type

There are several small areas with increased risk for diarrhea associated with percent of households with unimproved water source and rainfall, including northeast Nigeria, northern Burkina Faso, and coastal Benin (all dry), and two places in Ghana, both with heavy rain conditions.

Areas of positive associations between diarrheal disease and both unimproved toilet type and rainfall include western Senegal (including Dakar), central Senegal, western Mali, southwestern Benin, and the northern area of Nigeria and Cameroon which were all under dry conditions. In central Guinea, there was heavy rain.

Population density and water source or toilet type or education

There is some overlap between areas of positive associations between diarrheal disease and both population density and percent of households with unimproved water source (southwestern Côte d'Ivoire), but more so with population density and percent of households with unimproved toilet type. Areas where both these variables have positive associations are mostly in sparsely populated places such as central Senegal, western Mali, and the northern tip of Nigeria and Cameroon. A few mid-size cities also show overlap including Labé in western Guinea (which is surrounded by low population density) and Ouidah in coastal Benin.

Population density and education are both positively associated with diarrhea in sparsely populated areas of Guinea and Ghana (not including Accra) and in and south of Mopti (Mali) and Ilorin (Nigeria). Areas of positive

associations for education and negative for population density include eastern Ghana, western Benin, and parts of western Nigeria.

Altitude and water source or toilet type

There are areas of positive associations between diarrheal disease and both altitude and percent of households with unimproved water source in Guinea (including Conakry), and Lagos and its northern environs. Altitude is negatively associated and percent of households with unimproved water source is positively associated in Sierra Leone (including Freetown), northern Nigeria, and smaller areas in Ghana (Obuasi town) and Benin (including Bohicon town).

Positive associations for unimproved toilet type and altitude overlap in two low elevation coastal areas – the north coast of Guinea, and the Niger River Delta area in Nigeria as well as in relatively low areas such as along the Niger River in Mali and the Lake Volta area in Ghana. There is also overlap in the highlands of northern Côte d'Ivoire/southern Burkina Faso. Areas where altitude is negatively associated with diarrheal disease and toilet type is positively associated include western Senegal including Dakar and parts of northern Nigeria and Cameroon.

3.4 Discussion

While causality cannot be inferred from this cross-sectional study, the analysis has shown that there is spatial variation in the relationship between childhood diarrhea and key socio-economic, climatic, and environmental characteristics in West Africa.

The global Poisson model gives one coefficient per explanatory covariable for the whole study area. Thus, the interpretation would be that a one-unit increase in the covariables latitude, altitude, rainfall, and population density slightly increased relative risk of diarrheal disease, while a one-unit increase in the covariables temperature, percent with unimproved toilet type and percent of mothers with no formal education slightly decreased relative risk at the 0.10 level, *ceteris paribus*. Percent with unimproved water source shows no statistically significant association with diarrheal risk from a global model perspective. Overall drier climates (in West Africa, higher latitudes) are often associated with elevated diarrhea risk due to threats to food security, and it is plausible this is the case for higher altitudes as well.[5,6] However, averaged over the whole study area, rainfall increases risk, perhaps due to the contamination of water sources. Increasing risk with increasing population density implies that there is an urban disadvantage in this area for child health, perhaps due to failed infrastructure and lack of access to services for poorer households. Decreased temperatures may be overall protective in this study region because of decreased evaporation of water sources, which can concentrate pathogens, and decreased fly activity. The results for percent with unimproved toilet types is unexpected, but may speak to findings from other studies which show that increased coverage of improved latrines is not necessarily protective if communities still have high rates of open defecation or low rates of handwashing with soap.[40] Regarding the similar result with the educational attainment of mothers, perhaps education is more important at the household level than the community level. For example, a study of 28 subSaharan African countries found no statistically significant decreased odds of child mortality in communities (defined as DHS sampling points) where there was a relatively high proportion of mothers with secondary or higher education.[41] Overall, these small coefficient values may indicate that there is spatial variation which is averaged out in the global model.

The GWPR analysis shows that the relationships between these covariables and diarrhea are more complex, with each covariable acting as both a risk factor and apparently, as a protective factor, depending on location.

Additionally, there are specific locations for each variable where it is statistically significant and places where it is not.

The range of risk for different variables is considerable (Table 3.8). The household-level variables of percent of households with unimproved water source and toilet type and percent of mothers with no formal education have the narrowest ranges and are fairly centered around a relative risk of 1.0. Decreased risk associated with these variables is difficult to interpret, but perhaps there are other factors which drive the disease pathway more strongly. For example, in the lower Niger River Delta area, it seems that having a higher proportion of mothers without education is protective against diarrheal disease. However, this area also has increased risk due to poor sanitation, which could be the factor that drives diarrheal incidence more strongly.

Water source, sanitation, and education are modifiable risk factors and their improvement is often the aim of development projects and global initiatives such as the Sustainable Development Goals.[42] There is evidence that integrated approaches such as joint education and sanitation programs increase the impact of health programs and are more cost effective than singular approaches.[43] Additionally, risk factors for many conditions affecting children such as diarrhea, malnutrition and pneumonia are similar.[1,44] Therefore, while many different approaches are necessary to improve child health and none should be devalued, the type of analysis shown here could indicate which risk factors are more prominent in particular locations and could assist with strategic planning, resource allocation, and coordination. For example, in northeastern Nigeria, diarrhea risk is affected by both water source and toilet type, so increased services in both water and sanitation may be important to decrease diarrheal disease. In other places, however, one intervention may take precedence over another such as water source improvement in Conakry and Freetown and sanitation improvement in Dakar.

Risk associated with population density has a slightly broader range, from 0.65 to 1.68. Explicitly, this means that an increase of 100 people per square kilometer invokes as much as a 35% decreased risk for diarrhea in some places, but the same stimulus invokes up to a 68% increase in risk in other places. The interpretation is that there is an urban advantage for diarrheal disease in places such as Yaoundé, but an urban disadvantage in Ouagadougou and Cotonou. In Cameroon, which has large sparsely populated areas due to mountains and rainforest, the concentration of people may improve child health by promoting economic opportunities, adequate health care, infrastructure and housing. However, in other urban settings, the poor live in slums with sub-standard infrastructure and housing and may not be able to take advantage of health services, all of which increases risk of childhood diarrhea.[45]

Because of urban health advantage and disadvantage, increasing population density and urbanization in the developing world is a major area of both concern and opportunity.[46] In the ten countries studied here, population density is comparatively low with a median of 65 people/square km in 2010 (the same as present day Mexico).[47] However, by 2050, density is expected to increase 2- to 3-fold such that Nigeria will have the same population density as present day India.[47] Additionally, the populations in seven of the ten countries in this study were majority rural in 2010, but by 2050, all will be majority urban from 52% in Burkina Faso to over 70% in Côte d'Ivoire.[48] This means that while sparsely populated rural areas are and will continue to be important in the fight against diarrhea and other diseases, urban health will impact a growing proportion of the population. In West Africa, the places likely to remain relatively rural are the northern Sahel (the southern edge of the Sahara Desert) and mountainous regions such as in Cameroon. Urban growth is likely along developing international highway systems such as the coastal roads from Lagos to Nouakchott (Mauritania), across the Sahel from Dakar to Ndjamena (Chad), and along the Ibadan-Lagos-Accra corridor, which has a current population of about 25 million people.[49,50] This analysis indicates that responses to increased or

decreased population density will differ by location, so that one strategy may not be appropriate for planning for future populations. For example, coastal cities may face specific risks from climate-sensitive diseases because crowding and poor infrastructure could be exacerbated by storms, flooding, and rising sea levels.[51,52]

Climatic and environmental factors have the largest ranges of relative risk, especially rainfall where an increase of 10 mm invokes up to a 57% decrease in diarrhea risk, but also up to a 41-fold increase, depending on location. Temperature and rainfall data can be difficult to interpret because of the nature of survey fieldwork. Interviews within each sampling point were conducted within a maximum of 4 days; thus the temperature and rainfall data are accurate. However, within sub-national regions, interviews may be spread out over months, thus creating a "patchwork" of different temperature and rainfall regimes. This could lead to bias both in the analysis of data and in the interpretation. For example, interviews were conducted within a short time span in western Mali and northeast Nigeria and provide a snapshot of climatic conditions. In places like Burkina Faso, however, relationships between climate and diarrhea may be hidden within the multiple temperature/rainfall regimes. Here, a few areas with more stable measures are discussed. Compared to the rest of the study area, children in western Mali and eastern and western Guinea, who were experiencing cool temperatures, were at increased risk of diarrhea. Children in northeast Nigeria, where it was hot, had decreased risk. In western Mali and northeast Nigeria, conditions were dry and are associated with increased risk. In eastern and western Guinea, very rainy conditions decreased risk. Therefore, a preliminary interpretation may be that warmer temperatures or heavier rainfall are protective for diarrhea in some areas. However, much depends on seasonality and climate type, which is not fully captured here. Risk is decreased in higher latitude steppe areas in western Mali and northeast Nigeria, both of which were in the dry season. However, risk increased in eastern Guinea, which was in the savannah rainy season. Increased risk is seen in coastal Sierra Leone and Guinea, where rainfall and temperatures were quite high in a monsoonal climate

class, indicating there could have been a high presence of bacterial pathogens and perhaps contamination of drinking water sources.[53] Conversely, higher risk in western Mali where it was cool and dry in a steppe climate class could indicate the presence of viral pathogens such as rotavirus, which prefer cooler temperatures.[53]

Altitude also had a broad range of relative risk, from up to a 67% decrease in risk per increase of 100 meters in elevation up to a nearly 3-fold increase of risk. In low areas, including along the coast, risk may decrease with higher elevations since this would reduce exposure from flooded sanitation systems during storms or flooding (which is not captured in this analysis). Decreased risk is seen in low-lying parts of Senegal (including Dakar), Sierra Leone (including Freetown), and western Ghana, but the opposite is found in coastal Guinea and Benin, central Mali, Lake Volta, Lagos and the Niger River Delta area. This implies that compared to the rest of the study area, low elevations are protective in these areas at the time of the survey, perhaps because livelihood opportunities (e.g., natural crop irrigation and fishing in Lake Volta and along the Niger River) generally benefit child nutrition and health and outweighed risk from flooding. Higher elevations may be protective in the Guinea Highlands and the Bangiagara Escarpment in Mali compared to other areas, perhaps because these populations are quite sparse and isolated, which can thwart the spread of infectious disease.

Despite multiple challenges, communities in Africa have shown resilience and adaptive capacity for building on strong social networks, diversifying crops and livelihoods, migrating, and exploiting natural resources.[54] New threats and opportunities from climate change will require new adaptation measures to protect child health. Surface temperatures have increased over West Africa and the Sahel for the past 50 years and are projected to rise between 3 and 6□C above late 20th century baseline by the end of the 21st century.[54] There is more inter-model variation in rainfall projections in West Africa than for temperature, both in amplitude and direction of change. Some models project that there will be more extreme rainfall days in May and July across West Africa and the Sahel and more intense and frequent rainfall in the Guinea Highlands and Cameroon

mountains.[54] Sea-level rise is also a threat to some areas of West Africa, especially Nigeria where some 3 million people may be flooded per year by 2100.[52]

The type of analysis shown in this paper here could help improve adaptation measures. For example, the risk of diarrheal disease in parts of Mali and Guinea may be especially sensitive to temperature changes and also have increased risk associated with sanitation and so therefore could be targeted for adaptation interventions. Similarly, coastal Benin, which is subject to sea level rise, shows sensitivity for diarrheal disease to rainfall as well water source and toilet type and could be an area of particular concern.

3.5 Conclusion

In this research, the associations between childhood diarrhea and key socio-economic, climatic, and environmental characteristics were first studied in a global model and then in terms of their spatial stationarity across West Africa. The global model produced coefficient values which only partially support the original hypotheses. Water source type – generally considered a key indicator in the study of diarrheal disease - was not statistically significant. Latitude, altitude, and population density coefficients were in the expected direction with increases resulting in increased risk. Rainfall and temperature coefficients were in the opposite direction as was hypothesized with increased rainfall and decreased temperatures increasing risk. Increases in the percent of households with unimproved toilet type and percent of mothers with no formal education apparently decrease risk. However, the coefficient values were all close to 1 and are interpreted as averages which mask both positive and negative associations at different locations. For a covariable such as rainfall, for example, there is evidence that both too little and too much precipitation could be detrimental to child health depending on where a particular child lives.

In the Geographically Weighted Poisson Regression model, every covariable was found to be non-stationary.

This partially supports the original hypothesis which posited that some associations would be stationary (climate class/latitude, altitude, and population density), others would be non-stationary on a regional scale (rainfall, temperature), and the remainder (water source, toilet type, and mother's education) would show stationarity at the country level and non-stationarity at the regional level. This shows that associations between diarrheal disease and a variety of factors differ over space, speaking to the importance of spatial methods and analyses at different spatial scales. In the GWPR model, every covariable also showed positive and negative associations (increased or decreased risk) depending on location. This supports the original hypothesis for the environmental and climatic covariates as there is evidence for both protective and detrimental outcomes resulting from urban living, high or low rainfall, overall arid or monsoon climates, etc. Consistent positive associations were expected for the socio-economic factors (increased percentage of households with unimproved water sources and toilet types and percent of mothers with no formal education would be associated with higher risk), and it is difficult to interpret the dynamics where there are negative associations.

Water source, toilet type, education, population density, temperature, and altitude had as much as a 72% decrease in risk (for temperature), up to a 2.8-fold increase in risk (for altitude), and with an average of 32% of sampling points statistically significant at the 0.10 level. Latitude and rainfall had wider ranges and a greater percentage of statistical significance. Latitude invoked as much as a 98% decrease in risk and up to a 15-fold increase with 48% of sampling points significant, and rainfall invoked up to a 57% decrease in risk and as much as a 41-fold increase with 64% of sampling points significant.

Thus, the GWPR analysis as a whole shows complex patterns of risk for diarrheal disease which were masked by the global model.

This analysis is best seen as an exploration of regional dynamics which, with further research, could be useful in discerning areas where development and adaptation initiatives including specific interventions could reduce diarrheal disease and improve child health overall. In many areas, risks associated with different covariables were overlapping, indicating that integrated interventions are key. Areas of special interest include urban centers, low-elevation areas (coastal and along rivers), remote areas such as western Mali which face multiple risk factors, conflict zones (northeast Nigeria), and special populations such as the Dogon who live along the Bangiagara Escarpment.

The main strength of this study is that it uses the relatively new method of Geographically Weighted Poisson regression to examine spatial variation in associations between risk factors and a major cause of child morbidity and mortality in a high-burden area. It contributes to other GWR studies on disease and risk factors, most of which show that a global statistical models may produce misleading results.[15] The study also contributes to the small body of literature on GWPR by including eight socio-economic and environmental/climatic variables whereas most studies use fewer variables of one type. It is the only health study to our knowledge that uses latitude as a proxy for climate class, and one of few that examines altitude and diarrheal disease empirically. Finally, this study introduces several techniques not seen in other GWPR studies. One is the selection of variables for modeling using AICc to determine which aggregation of data will contribute most to model performance. Second is showing the percentage of sampling areas points with statistical significance for each coefficient so that researchers have a numeric sense of significance in addition to the visual aid of maps. Thirdly, this paper improves upon mapping techniques hereto employed by making both the magnitude and direction of the associations explicit.

The study has several limitations, most notably that it is an ecological study and cannot be used to make inferences at the individual level. Also, the survey data used here introduces temporal complexities at

different levels. First, there is a five-year difference between the earliest and latest surveys, during which time considerable progress (or deterioration) can occur, making a trans-national comparisons difficult. Secondly, in places where the survey fieldwork was spread out over weeks or months, variables which can change quickly such as rainfall were inconsistent and difficult to analyze and interpret. Thirdly, the 2-week recall period for diarrhea introduces bias. Finally, there are several weaknesses with GWR itself, including multicollinearity across local estimates.[55] The method is best used as an exploratory method and not to definitively confirm spatial non-stationarity.[32]

Future research on this topic could take several approaches. One would be to focus on smaller spatial and temporal scales which should provide more consistency and greater detail, perhaps with less evidence of nonstationarity.

3.6 References

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Map credits

Figure 3.1:

- Food and Agriculture Organization, 2006, MODIS Satellite Image mosaic 2.5d enhanced (~230 m) http://www.fao.org/geonetwork/srv/en/resources.get?id=30977&fname=af_bmng-shd.zip&access=private
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Figure 3.5a:

- Rubel, F., and M. Kottek, 2010: Observed and projected climate shifts 1901-2100 depicted by world maps of the Köppen-

  Geiger climate classification. Meteorol. Z., 19, 135-141. Observed 1976-2000 http://koeppen-geiger.vuhttp://koeppen-geiger.vu-wien.ac.at/shifts.htmwien.ac.at/shifts.htm

Chapter 4. Conflict and Health: Has the Boko Haram Insurgency in Northeast Nigeria Affected Childhood Malnutrition and Diarrheal Disease?

Abstract

This research examines the relationship between conflict and childhood malnutrition and diarrheal disease in Northeast Nigeria whose residents have been subjected to fighting between the Nigerian government and Boko Haram - an extremist Islamist movement - since 2009. Using two household surveys from before and after the Boko Haram insurgency started, a double-difference (difference-in-difference) approach was used to assess the impact of the conflict on weight-for-height, height-for-age, and weight-for-age z-scores; moderate/severe wasting, underweight, and stunting; and diarrhea prevalence. Results suggest that if children exposed to the conflict had not been exposed, their average weight-for-height z-scores would be 0.49 standard deviations higher ($p < 0.001$) than they are, bringing the average from -0.74 to -0.25 (as per the World Health Organization, from a "serious" nutritional crisis to a "poor" one). Additionally, the prevalence of moderate/severe wasting would be 13 percentage points lower (mean z-statistic -4.2) than it is, bringing the proportion down from 23% (a "critical" nutritional crisis) to 10% (a "serious" nutritional crisis, and close to the average for all of West Africa, which is 9%). Diarrhea prevalence also improves in the counterfactual scenario with a decrease of 8 percentage points (mean z-statistic -3.3), bringing rates down from 20%, to 12% (close to the overall Nigerian average of 10%). The double-difference estimate was not statistically significant for weight-for-age z-scores or moderate/severe underweight and height-for-age and moderate/severe stunting did not meet the common trends assumption. Descriptive evidence suggests that poor child health outcomes in the conflict areas of Northeast Nigeria may be due to disruptions to infrastructure and social services and increased food insecurity in an already resource poor area. Although causal inference is somewhat limited since other unidentified factors may contribute to both conflict and malnutrition/diarrhea, the findings merit further research because of their potential importance to children living in extreme circumstances.

4.1 Introduction

Children under five years old in developing countries are particularly vulnerable to health risks because their immune systems are not yet fully effective, they are dependent on others for care, and they are exposed to hazards such as unclean water and food insecurity.[1] In 2015, 5.9 million children were expected to die with 80% of those deaths in sub-Saharan Africa and South Asia.[2] A child in a conflict setting is twice as likely to die as a child in a stable environment.[2,3]

Conflict affects child health through multiple pathways both directly and indirectly. Community and household resources may be diminished as funds are diverted away from social services (such as immunization programs), prices for food and other commodities rise, and fear or physical obstacles (checkpoints, landmines) prevent caregivers from pursuing the family's livelihood activities (such as accessing fields and livestock grazing lands).[4,5] Infrastructure such as health facilities, markets, water supply and sewage systems, schools and roads may be damaged or otherwise inaccessible.[4,5] Supply chains for food imports and essential medicines are often disrupted.[4,5] Populations may be forced to leave a conflict zone which could expose them to inadequate shelter, water, sanitation, and food and deprive them of livelihoods.[4,5] Displacement puts additional stress on host populations and their services and could increase population density.[5] Skilled healthcare and other personnel may leave the area and the most vulnerable households may be unable to do so.[5]

Most deaths due to conflict, particularly for children, are not from direct causes such as war-related trauma, but rather are due to the conditions that were already the main causes of death before the conflict including diarrheal disease, acute respiratory infections, measles, malaria, and severe malnutrition.[6] Therefore conflict seems to both exacerbate pre-existing health issues and introduce new ones.[6,7]

Malnutrition and diarrheal disease are two outcomes of particular interest in the study of child health and conflict because of their overall contribution to morbidity and mortality in the developing world and their sensitivity to disruptions commonly found in war zones such as increased food insecurity.[6] Malnutrition is a contributing condition in about 45% of all child deaths worldwide and in 60% of child deaths attributed to diarrheal disease.[8,9] Malnutrition and diarrheal disease form a vicious cycle of decreased energy intake and loss of micronutrients (due to lack of ingestion as the child weakens and intestinal malabsorption) and increased vulnerability to infection with the breakdown of mucosal barriers and immune system dysfunction.[9] In addition to short-term risks of illness and death, long-term consequences can include impaired physical and intellectual development and higher risk for metabolic and cardiovascular disease.[10,11]

Malnutrition is usually assessed using body measurements such as weight and height in combination with age and sex to determine growth or failure to grow.[12] A child's measurements are compared to a reference population to determine whether he or she falls outside of the expected distribution for any one of several anthropometric measures and if so, by how many standard deviations. A z-score (or standard deviation score) is the difference between an individual child's value and the expected value of the reference population. A child is classified as moderately malnourished if he or she is more than 2 standard deviations below average and severely malnourished if he or she is more than 3 standard deviations below average.[12] The World Health Organization reference standards introduced in 2006 are the most commonly used today.[13,14] These standards are based on optimally fed children of different ethnic and regional origins. They are predicated on the assumption - confirmed by numerous studies - that the distribution of basic nutrition scores for healthy, well-nourished children is similar in most human populations.[13]

In acute emergencies where local capacities are overwhelmed, the preferred measure of malnutrition is weight-for-height because weight is sensitive to sudden changes in food availability.[4,7,15] Height-for-age, which develops over the life of the child may be a more appropriate measure for chronic food insecurity.[7] Weight-for-age reflects both acute and chronic nutritional deficits, but is considered less useful than the other indicators.[11]

A summary of these three most common measures of malnutrition in children are shown in Table 4.1, below:

Measure	Condition	Notes	Classification (z-scores compared to reference standards)	
Weight-forHeight (WH)	Wasting	▪ Wasted children are thin for their height ▪ Result of recent rapid weight loss or failure to gain weight due to acute infection and/or inadequate dietary intake ▪ Reversible if conditions improve ▪ Evidence of acute malnutrition	Moderate wasting < -2 but > -3	Severe wasting < -3
Height-for-Age (HA)	Stunting	▪ Stunted children are short for their age ▪ A slow and cumulative process due to inadequate nutrition, repeated infection, or both ▪ Not an indicator of current health and nutrition status, as growth failure may have occurred in the past ▪ May be irreversible after about two years of age ▪ Evidence of chronic malnutrition	Moderate stunting < -2 but > -3	Severe stunting < -3
Weight-for-Age (WA)	Underweight	▪ Underweight children are light for their age ▪ Due to wasting, stunting, or a combination of both	Moderate underweight < -2 but > -3	Severe underweight < -3
* Children with nutritional edema – retained fluid which can contribute up to 50% of a child's weight - are always classified as severely malnourished (i.e., < -3 weight-for-height regardless of actual weight)				

Table 4.1: Summary of malnutrition measures. Adapted from UNICEF.[12]

The effects of war on child health are often studied through household surveys either in real time or retrospectively. In one of a series of mortality surveys in the Democratic Republic of Congo, a strong association between conflict and both violent and non-violent deaths was found.[16] In conflict and non-conflict areas of the country, the main reported causes of death were fever and malaria, diarrheal disease, and respiratory infections.[16] Children are most vulnerable to these diseases and those under five had nearly four times the risk of dying than people five and older.[16] Malnutrition was reported as an underlying or primary

cause of death in 10.9% of deaths in conflict areas and 8.1% in non-conflict areas.[16] In Burundi, the civil war of the 1990s was marked by displacement, looting of household assets (including livestock), and the theft or burning of crops.[17] Using a spatiotemporal conflict exposure variable, researchers found that rural children who had been exposed to war for more than 14.7 months (the average exposure time) had height-for-age zscores 0.67 standard deviations lower than rural children who had not experienced war ($p < 0.01$).[17]

Additionally, for every month of exposure, height-for-age z-scores decreased by 0.05 standard deviations.[17] A study in Angola found higher levels of malnutrition (wasting and stunting) in conflict-affected areas and among assumed supporters of the opposition (determined by ethnolinguistic group), even after controlling for urbanrural and other demographic differences.[7]

This study contributes to the literature on conflict and child health by examining the associations between the recent conflict in Northeast Nigeria and the prevalence of malnutrition and diarrheal disease. The hypothesis is that malnutrition and diarrhea rates will be similar in conflict areas and non-conflict areas before the start of the insurgency with a generally improving trend over time, but that rates will increase in conflict areas after the start of the insurgency while maintaining a general downward trajectory in non-conflict areas. Furthermore, it is hypothesized that an estimation of the counterfactual – the average outcome for conflictaffected children if they had not been affected - will show improvements through increased z-scores (closer to the global average) and reduced rates of moderate/severe malnutrition and diarrhea. Weight-for-height and diarrhea prevalence are expected to show the largest effect because these outcomes are sensitive to acute emergencies, while the effects for height-for-age and weight-for-age may not be as evident.

Nigeria and Boko Haram

Nigeria is Africa's most populous country and among its most diverse with over 400 ethnolinguistic groups.[18] The country is affected by several conflicts based on overlapping ethnic, religious, political and regional divisions including over resources in the Niger Delta, Christian-Muslim divides in the middle of the country, and most recently, the rise of Islamist groups in the north, most importantly, Boko Haram.[18] Boko Haram ('Western education is a sin') was founded around 2002 in Maiduguri, the capital of Borno state and largest city in Northeast Nigeria (Figure 4.1).[19] At least at its inception, the main tenet among its followers was regime change in Nigeria as they believe democratic and secular rule is in contradiction to *Shariah* – a way of life for Muslims based on the Quran and the teachings of the Prophet Muhammad.[19]

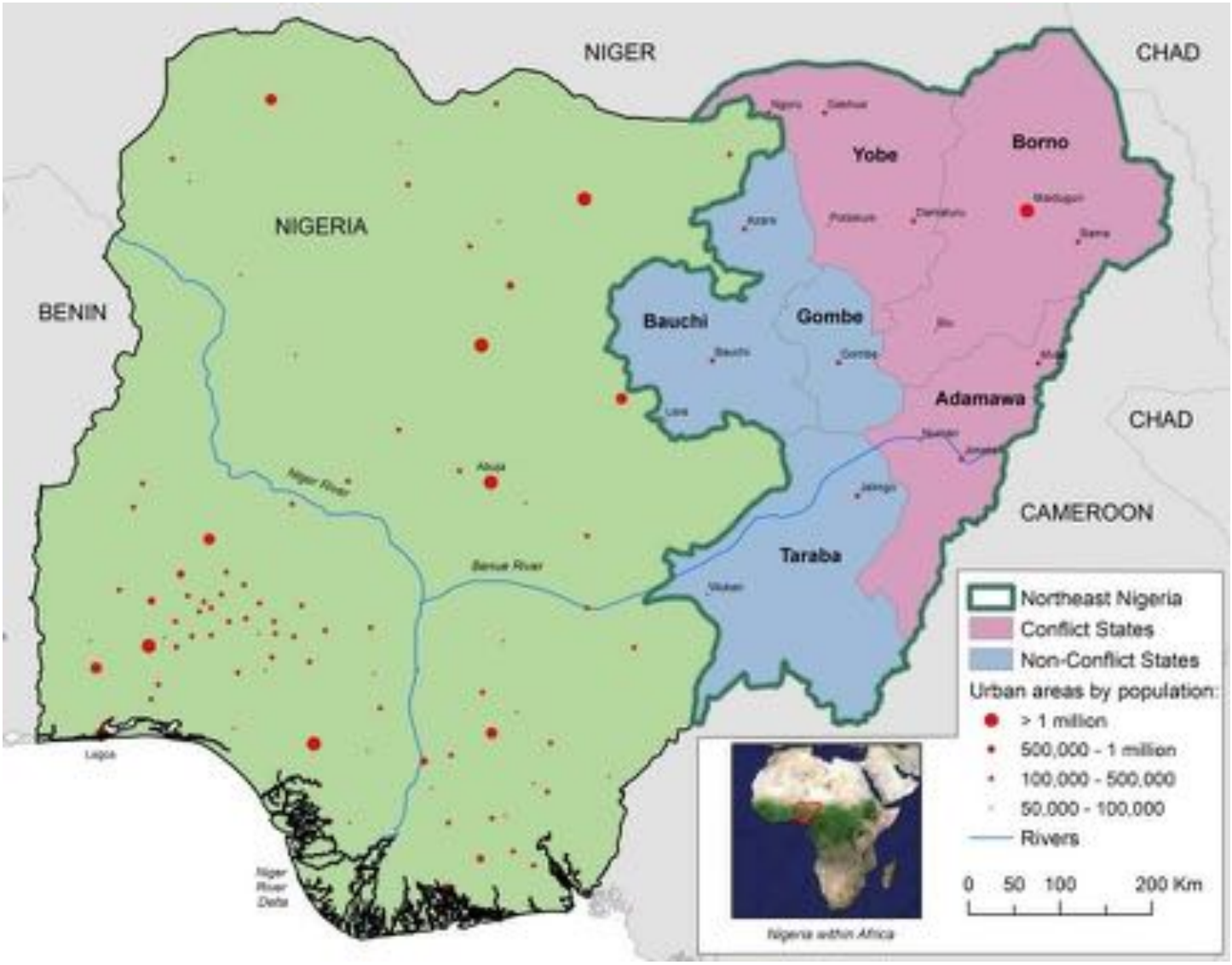
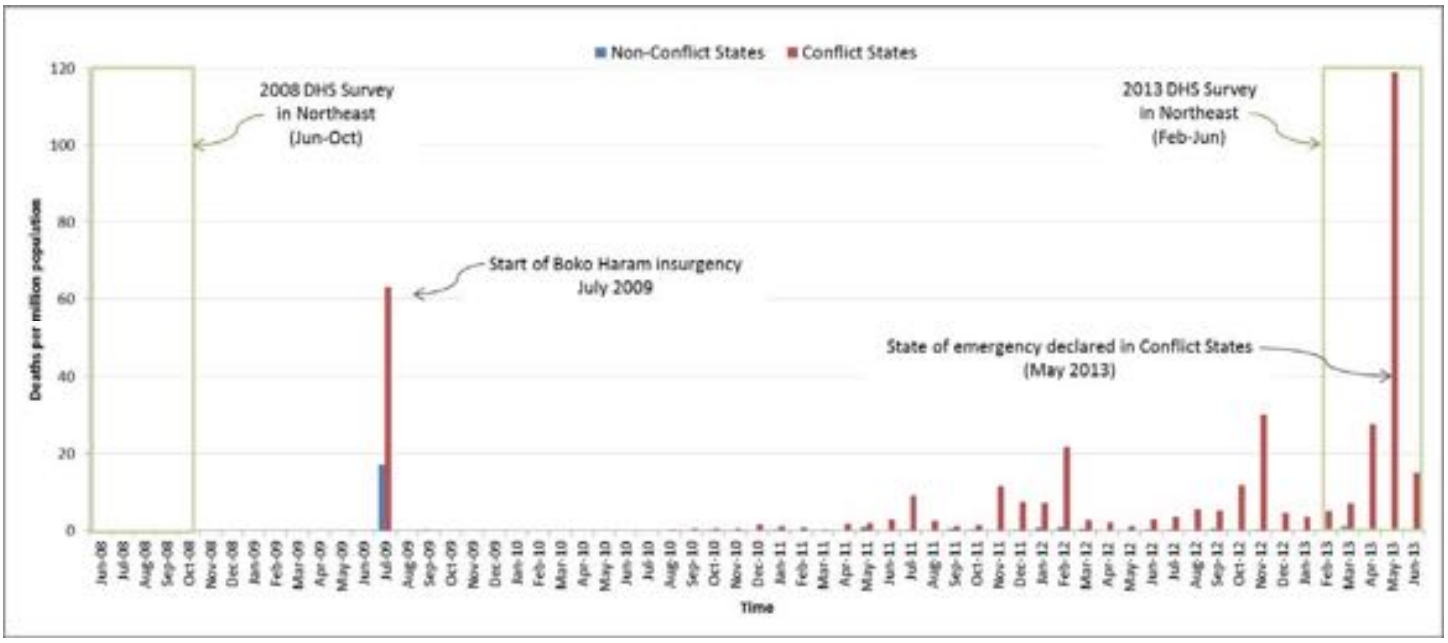


Figure 4.1: Northeast Nigeria with conflict and non-conflict states.

In July 2009, the Boko Haram uprising began in Bauchi and spread to other northern states, leaving hundreds of followers, Nigerian law enforcement officers, and civilians dead.[20] The leader of Boko Haram was captured and killed while in police custody in what is widely believed to be an extrajudicial execution.[20] The uprising left Boko Haram without a leader, drove the organization underground, and marginalized more peace-seeking members which eventually lead to radicalization and splinter groups such as Ansaru which have a purely combatant mandate.[19] The following year, a new leader took over Boko Haram, and attacks in the Northeast and other parts of the country including bombings, mass shootings, and executions began to rise.[20] In May 2013 the president declared a state of emergency in the states of Borno, Yobe, and Adamawa and deployed large numbers of troops to quash Boko Haram.[20] By November 2013, The US State Department had designated Boko Haram and Ansaru as Foreign Terrorist Organizations, but it was when 276 girls were abducted from their school in Chibok, Borno State in April 2014 that this conflict gained international attention.[20]

Figure 4.2 shows a timeline of these events using violent deaths attributed to events involving Boko Haram as a proxy for the intensity of the conflict. There are many indirect effects on the civilian population and these deaths include combatants on both sides, but the objective here is to distinguish between Borno, Yobe, and Adamawa as the affected group - called “conflict states” - and Bauchi, Gombe, and Taraba as the comparison group - “non-conflict states”. People in the non-conflict states have certainly been affected by the crisis, but the entire population of Borno, Yobe, and Adamawa states are considered directly impacted by the Boko Haram insurgency.[21] The timeline also shows July 2009 as a hard date for the start of the crisis in its current violent form.[22] This serves as the demarcation between pre-intervention and post-intervention for this study.



[23]

Figure 4.2: Timeline of deaths attributed to events involving Boko Haram in Northeast Nigeria. Data from Nigeria Watch.

At the start of the conflict, little was known about disruptions and displacement in the most affected areas. For example, as of August 2015, there were 1.4 million displaced people within the Northeast (1.3 million of whom were in the conflict states) and 170,000 refugees. In July 2013, however, little was known about internal displacement, although 9,000 refugees had already left Northeast Nigeria for neighboring countries.[18,21]

As a whole, northern Nigeria is poorer than southern areas and even before the conflict, the states of the Northeast ranked below the southern states on most socioeconomic indicators.[21] Food insecurity in Nigeria is attributed to high food prices (especially in urban areas) and a lack of agricultural input and drought in rural areas (in Northeast Nigeria, 28% of food is produced by the household – the highest rate in the country).[24] Access to health care is historically difficult due to poverty and distance to facilities.[25] Education, which already had low achievement indicators compared to the rest of the country, has suffered even more with attacks on schools, abductions, and forced recruitment of children since 2012.[26]

4.2 Methods

Data

This study uses data from two Demographic and Health Surveys (DHS), one of which was conducted in Nigeria in 2008 and the other in 2013 (Figure 4.2).[27] The DHS are large, nationally representative household surveys which have been conducted in low- and middle-income countries since 1984.[27] The DHS uses a two-stage sampling methodology.[28] The country is first stratified by geographic (usually administrative) regions crossed with urban or rural designation.[28] In each stratum, enumeration areas determined by the most recent census are used.[28] In the first stage, a number of primary sampling units are selected from the enumeration areas in each stratum.[28] The household lists in these areas are updated, and a fixed number of households are selected.[28] All household members within a specific group (relevant here is all women age 15-49) in the selected households are chosen for the survey.[28] Those women with children age 0-59 months are asked about the health and care of their children and the children are measured and weighed.[27] Only those children who were alive at the time of the survey are included in this analysis.

The outcome variables of interest are malnutrition and diarrhea. Malnutrition is measured both as a continuous variable using z-scores for weight-for-height (WHZ), height-for-age (HAZ), and weight-for-age (WAZ) and as a binary outcome (moderate/severe wasted or not, moderate/severe stunted or not, and moderate/severe underweight or not). Diarrhea is a binary variable of whether the child has had diarrhea in the past 2 weeks or not. As per WHO guidelines, data were excluded if a child's WHZ was below –5 or above +5, HAZ was below –6 or above +6, or WAZ was below –6 or above +5, because these extreme values were most likely a result of errors in measurement or data entry.[13]

In addition to exposure to conflict, explanatory covariables include characteristics related to the environment, household, caregivers, and individual child as detailed below.

Environmental factors are:

- The month of the interview. This is used to control for seasonal effects of the survey as the rainy
- season starts in about May and runs through September in the Northeast, after which there is extremely little rainfall. The rainy season is a key factor for primary food production for rural populations.
- Altitude, which ranges from about 100 to 1,500 meters for the sample population. Altitude may determine livelihoods and remoteness of populations.
- Urban/rural designation. Esri's "populated places" dataset was used rather than the DHS classification as it is slightly more restrictive, using urban centers of only 50,000 people or more.[29]
- Urban population rank. Also from the Esri dataset; classified as urban centers of population 50,000100,000; 100,000-500,000; 500,000-1 million; or greater than 1 million.[29] In the Northeast, there are no cities in the 500,000-1 million category and only one (Maiduguri) above 1 million. Also, by 2013, the smaller cities had transitioned to medium ones.

Household characteristics are:

- Wealth as determined by an index which accounts for the assets and services available to a household.[30] For this analysis, a binary variable was created for whether the household was in the bottom two wealth quintiles (poorest households) or not.
- Water source and toilet type. These factors were classified as either "improved" or "unimproved" as per the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) classification scheme.[31] Water and sanitation are part of the wealth index, but showed little collinearity for this dataset (VIF = 1.15 – 1.35).

- Number of people in household, which can have a positive effect on child health (many caregivers) or negative (stretched resources). For this reason, this term was also squared.
- Number of children under five and this term squared. Similar to the variable above, a household with many children may show pooled resources, but can also mean at least some of the children do not get the attention or resources they need.[32]

Caregiver (child's mother and mother's partner) characteristics include:

- Occupation, which is classified here as either in agriculture/not working or other. "Not working" is included because - especially for women - this means "not outside the home". Combined with the wealth index, this gives an indication of subsistence farming/pastoralism vs. reliance on outside wages.
- Educational attainment, here as a binary variable of no formal education or some education (primary, secondary, or higher). Attending a *madrasa* or other religious school is considered having no formal education in the Nigeria DHS.[33]
- Mother's religion, classified as Muslim or other (Christian or traditionalist).

Child characteristics are:

- Age in months. The term is also squared as, for example, stunting occurs primarily *in utero* and during the first 2-3 years of life.[34]
- Sex, as several studies show slight differences in malnutrition outcomes between boys and girls.[35,36]
- Birth order, also squared as for some health outcomes, higher birth orders may be protective up to a certain limit due to the experience of the mother and the help older siblings may provide in basic childcare.[32]

Double-Difference (DD) analysis

Double-difference (also known as difference-in-difference) analysis is a popular methodology to estimate the causal effects of policies or programs.[37] It is a quasi-experimental design which makes use of before and after groups, but without random assignment.[38] Double-difference (DD) analysis has been used at least once to study the effects of conflict (on education in Côte d'Ivoire) and on malnutrition (as a result of migration patterns in Guatemala).[34,39] The calculations and interpretations are relatively straightforward and the endogeneity problems that typically arise when making comparisons between heterogeneous individuals can potentially be avoided.[40] In DD analysis, first a time- and population-specific intervention such as the introduction of a policy or the inception of a new program is identified. Then the difference in outcomes after and before the intervention for those affected by the intervention are compared to the difference in outcomes after and before the intervention among those not affected by the intervention.

This can be written as:

DD = [(Intervention = 1 | Period = 1) - (Intervention = 1 | Period = 0)] - [(Intervention = 0 | Period = 1) - (Intervention = 0 | Period = 0)]

The DD approach is most frequently used within a linear regression model with a continuous outcome variable to which covariates may be added. In this study, the intervention is conflict and the model may be written as:

$$y = \beta_0 + \beta_1 * Conflict + \beta_2 * Period + \beta_3 * (Conflict * Period) + \beta_k * (environmental, household, caregiver, and\ child\ covariates) + \varepsilon$$

where the outcome variable *y* is the mean z-score, *Conflict* is a dummy variable coded 0 for conflict states and 1 for non-conflict states and *Period* is a dummy variable coded 0 for 2008 and 1 for 2013. The main coefficient of interest is β_3 - the interaction term of *Conflict* and *Period* - which is the estimate of the effect of the double difference. B_k represents the coefficients for covariates included in the model and ε is the error term. Note that for most DD analyses, exposure to the intervention would be coded 1; however here, we are interested in

what the outcome would have been for the exposed group (children in a conflict zone) had they *not* been exposed. Therefore the reverse coding is necessary to obtain the correct sign for the interaction coefficient.

In addition to any differences in mean z-scores, it is important to know if there are any changes in the likelihood that a child will be in the most vulnerable group – moderately or severely malnourished children. For this, logistic regression is used, which also allows for testing the likelihood that a child will have diarrheal disease or not. An advantage to the logistic model is that the marginal effects of the conflict can vary according to the characteristics of the individual child.[41] However, calculating the marginal effects of an interacted term such as the DD coefficient is not straightforward in non-linear models.[42] To facilitate this calculation, the user-written Stata command *inteff*, which computes the correct marginal effect for the interaction term as well as the standard errors and z-statistic, is used.[42]

The fundamental assumption of DD analysis is that of common (or parallel) trends.[43] In the language of this study, common trends means that if the Boko Haram insurgency had not started, the difference in child health outcomes in the conflict states and non-conflict states would be constant over time. In other words, in the absence of the conflict, children throughout the Northeast would be on a similar path (improving, worsening, or staying the same), *ceteris paribus*. If this assumption is not fulfilled, any estimation of the causal effect of the conflict will be biased.

Common trends is tested by examining earlier data, if possible. The DHS program conducted two surveys in Nigeria in 1990 and 2003 and these data were analyzed with the 2008 and 2013 data. First, proportions of moderate/severe wasting, stunting, and underweight and diarrhea were calculated without covariates. Then, to account for seasonal differences in the surveys, the month variable was included.[44] This was conducted in

Stata with the user-written command *svypxcat*, which calculates covariate-adjusted proportions corrected for survey weights.[45]

The 1990 and 2003 DHS surveys were at the zone (e.g., Northeast) level so the GPS coordinates of the sampling points were used to determine states. These earlier surveys also used a different nutrition reference standard, so the raw height and weight data were used to calculate the z-scores with the WHO standards using the Stata user-written command *zscore06*.[46]

After examining the results of the common trends analysis, it was determined which outcomes should be included in the linear and logistic regression models. These were conducted in Stata 14.1 first without any covariates, and then adjusted with the environmental, household, caregiver, and child characteristics.[47] Because the *inteff* command allows for continuous and indicator (0/1) variables, but not categorical ones, urban population was converted to an indicator variable for the logistic model.

4.3 Results

Population description

Descriptive statistics for the 2008 and 2013 populations are shown below for explanatory variables (Table 4.2) and health outcomes (Table 4.3). There are few missing observations for the explanatory variables, but the number is significant for malnutrition due to the challenges of field work and obtaining complete and credible measurements.[25,48]

The two surveys were done at different times of the year; during the entire rainy season in 2008 and spanning the dry season and start of the rainy season in 2013. Overall, the conflict states are more urbanized, mostly due to the presence of Maiduguri, where the proportion of the population grew from 7 to 13% between the

two surveys. The proportion of households in the wealthier three quintiles grew in the Northeast between 2008 and 2013, but unevenly; 10% in conflict states, but with no proportional change in the non-conflict states. Similarly, the average increase in access to improved water sources and toilet types from 2008-2013 was from 34 to 45%, but with a larger increase in the conflict states (water 18%, toilet 12%) vs. non-conflict states (water 10%, toilet 3%). Education rates are low in the Northeast; 72% of mothers and 60% of their partners have no formal education. About 85% of the population is Muslim.

While moderate or severe wasting declined in the non-conflict states by 10%, the proportion increased in the conflict states from 18 to 23%. There was a steep decline in the proportion of children with moderate or severe stunting in the conflict states from 49% to 36% while there was virtually no change in the non-conflict states. Proportions for moderate or severe underweight and diarrhea prevalence declined equally for conflict and non-conflict states; about 4% and 2%, respectively.

Variable	200		201	
	Non-Conflict (Proportions)	**Conflict** (Proportions)	**Non-Conflict** (Proportions)	**Conflict** (Proportions)
Weighted observations	*3,810*	*4,168*	*2,462*	*2,572*
Month of interview				
Feb - Apr	-	-	0.61	0.65
May - Jul	0.39	0.42	0.39	0.35
Aug - Oct	0.61	0.58	-	-
Altitude (m)				
92 - 250	0.17	0.12	0.13	0.11
251 - 499	0.59	0.77	0.66	0.77
501 - 999	0.23	0.09	0.15	0.08
1,000 - 1,562	0.02	0.02	0.06	0.01
Urban/Rural				
Rural	0.91	0.82	0.91	0.77
Urban	0.09	0.18	0.09	0.23
Urban population				
50 - 100,000	0.01	0.03	-	-
100 - 500,000	0.08	0.08	0.09	0.11
> 1 million	-	0.07	-	0.13
Not urban	0.91	0.82	0.91	0.77
Wealth				
Wealthier 3 quintiles	0.28	0.31	0.28	0.38
Poorest 2 quintiles	0.72	0.69	0.72	0.62

Water source				
Unimproved	0.71	0.64	0.61	0.46
Improved	0.29	0.35	0.39	0.53
missing	0.01	0.00	0.01	0.01
Toilet type				
Unimproved	0.67	0.61	0.64	0.48
Improved	0.32	0.39	0.35	0.51
missing	0.01	0.01	0.01	0.01
No. people in household				
2 - 5	0.31	0.29	0.28	0.38
6 - 8	0.32	0.35	0.31	0.32
9 - 43	0.37	0.36	0.41	0.30
No. under fives in household				
1	0.18	0.18	0.17	0.23
2	0.38	0.37	0.35	0.40
3 - 9	0.43	0.45	0.47	0.36
missing	0.01	0.01	0.01	0.01
Mother's occupation				
Other	0.47	0.35	0.50	0.32
Agriculture or not outside home	0.53	0.64	0.48	0.67
missing	0.01	0.01	0.01	0.00
Partner's occupation				
Other	0.44	0.47	0.47	0.49
Agriculture or not outside home	0.54	0.51	0.52	0.49
missing	0.03	0.02	0.01	0.01
Mother's education				
Some education	0.29	0.25	0.31	0.28
No formal education	0.71	0.75	0.69	0.72
Partner's education				
Some education	0.39	0.33	0.45	0.35
No formal education	0.57	0.65	0.53	0.64
missing	0.04	0.01	0.02	0.02
Mother's religion				
Other	0.20	0.13	0.17	0.09
Muslim	0.79	0.87	0.83	0.91
Child's age (months)				
0 - 5	0.14	0.12	0.12	0.10
6 - 11	0.11	0.10	0.11	0.11
12 - 23	0.20	0.19	0.21	0.20
24 - 59	0.56	0.59	0.57	0.59
Child's sex				
Female	0.49	0.51	0.49	0.49
Male	0.51	0.49	0.51	0.51
Birth order				
1st - 2nd	0.32	0.28	0.30	0.37
3rd - 4th	0.27	0.28	0.26	0.28
5th - 17th	0.41	0.44	0.44	0.36

Table 4.2: Proportions of environmental, household, caregiver, and child characteristics in conflict and non-conflict states of Northeast Nigeria, 2008 and 2013.

Variable	2008				2013			
	Non-Conflict		Conflict		Non-Conflict		Conflict	
	No.	Prop.	No.	Prop.	No.	Prop.	No.	Prop.
Weighted observations	*3,810*		*4,168*		*2,462*		*2,572*	
Moderate or severe wasting								
No	2,042	0.73	2,611	0.82	1,749	0.83	1,529	0.77
Yes	770	0.27	560	0.18	356	0.17	452	0.23
missing	*997*		*997*		*357*		*591*	
Moderate or severe stunting								
No	1,439	0.51	1,627	0.51	1,104	0.52	1,258	0.64
Yes	1,374	0.49	1,543	0.49	1,001	0.48	723	0.37
missing	*997*		*997*		*357*		*591*	
Moderate or severe underweight								
No	1,750	0.62	2,153	0.68	1,394	0.66	1,424	0.72
Yes	1,062	0.38	1,018	0.32	711	0.34	557	0.28
missing	*997*		*997*		*357*		*591*	
Diarrhea past two weeks								
No	2,836	0.75	3,379	0.82	1,871	0.77	2,030	0.80
Yes	925	0.25	737	0.18	544	0.23	518	0.20
missing	*49*		*52*		*48*		*24*	

Table 4.3: Number and proportions of health outcomes in conflict and non-conflict states of Northeast Nigeria, 2008 and 2013.

Common trends

There is no statistical test for common trends analysis, but visualization such as in Figure 4.3 is helpful for discerning patterns. Including the month of household interview term makes the trends more parallel for wasting and underweight, but not for stunting. This is logical, especially in rural areas where a child's weight may change quickly from season to season. This effect would not necessarily be seen with stunting, as that is a cumulative process over years. The trend for diarrhea prevalence changes slightly, most importantly, the slight upward tick from 2008-2013 in the unadjusted model becomes a downward trend in the adjusted model. Seasonal effects of diarrhea can be complex in sub-Saharan Africa. For example, increased rains can

contaminate water supplies, but the dry season can also concentrate pathogens, increase fly activity, and lead to poorer hygiene and food security.[49-52]

Wasting, underweight, and diarrhea prevalence fulfilled the common trends requirements. For wasting, the trends are similar before the start of the conflict and then diverge after the start of the conflict, so there is likely a significant double-difference estimate. For underweight, the trends are nearly parallel, and remain so after the start of the conflict, so any double-difference estimate is likely to be statistically insignificant. For diarrhea prevalence, after the start of the conflict, the rate of diarrhea declines in both conflict and nonconflict states, but apparently at a slower rate in the conflict states; thus there may be a statistically significant double-difference estimate. Stunting shows a nearly complete divergence of trends, indicating any doubledifference would not be valid, even if it was statistically significant because the result could not be attributed to the start of the conflict.

Based on these results, further analysis and discussions will focus on weight-for-height and wasting, weightfor-age and underweight, and diarrhea prevalence. For completeness, the results for height-for-age and stunting are shown in the Appendix and will be included in the discussion.

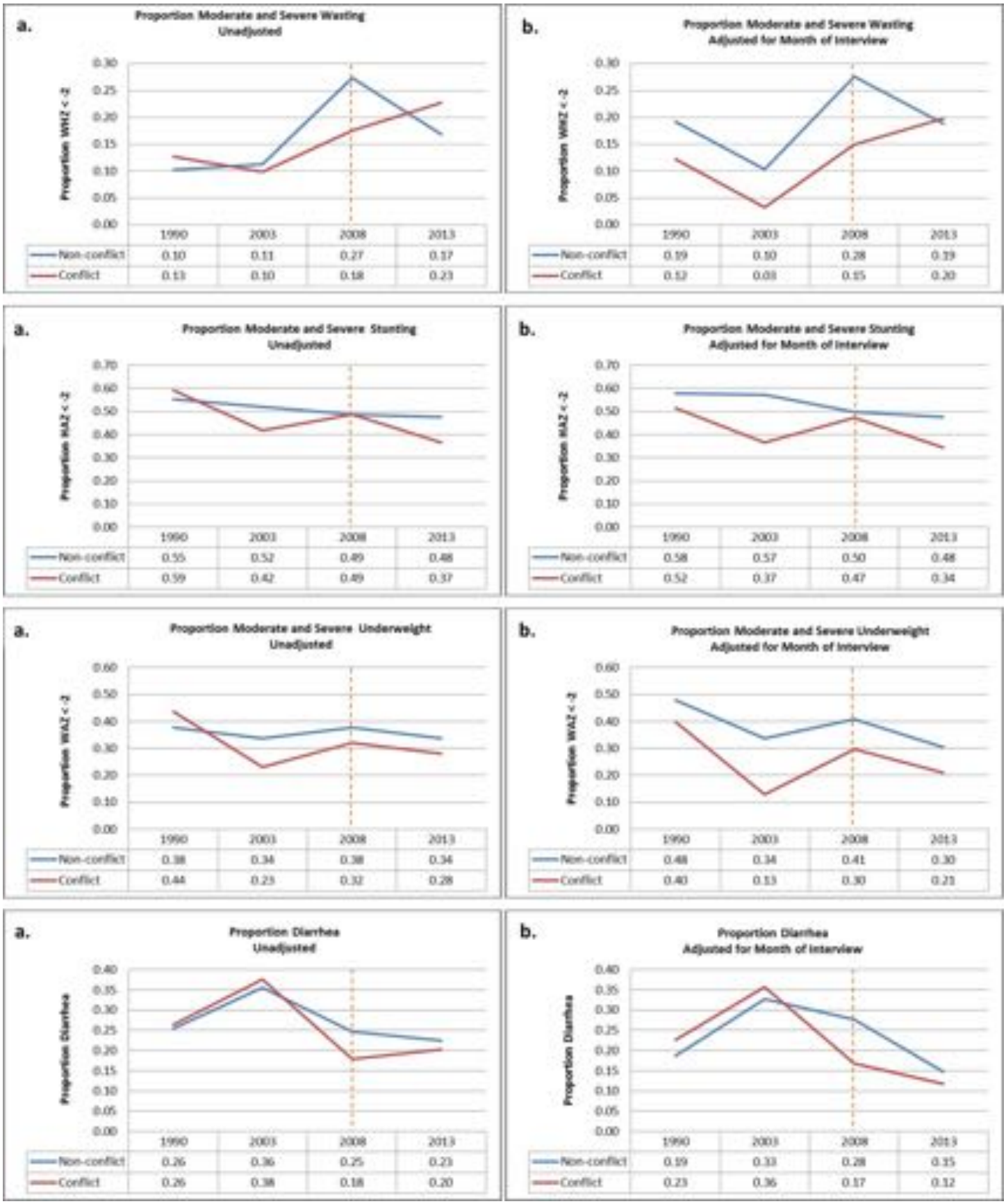


Figure 4.3: Trends in malnutrition and diarrheal disease in Northeast Nigeria's conflict and non-conflict states: (a) panels are raw proportions, (b) panels are proportions adjusted for month of household interview. Dotted orange line is the time point between the 2008 and 2013 surveys.

Weight-for-height z-scores

The results of the linear regression for weight-for-height z-scores are shown in Table 4.4. Model 1 is without covariates and Model 2 has all environmental, household, and child covariates. Model 3 has select covariates based on their significance in Model 2. The main coefficient of interest is "double-difference", which is highly significant in all the models. The results suggest that, *ceteris paribus*, if children who were exposed to the Boko Haram insurgency had not been exposed, their mean weight-for-height z-scores would be 0.49 standard deviations higher than they are ($p < 0.001$). More variance can be explained with the addition of covariates to Model 1 and the main difference between Model 2 and Model 3 is that the intercept increases from -0.40 to 0.27. On average, z-scores increase if the interview was conducted in the rainy season compared to the dry season. Altitude has a small, but significant effect with z-scores decreasing slightly for every meter gain in elevation. Urban/rural classifications were not statistically significant, although the size of urban center was. Specifically, children in Maiduguri had an average weight-for-height z-score 0.72 standard deviations higher than children living in small cities. Wealth was marginally significant, but the other household variables were not. Compared to children whose mothers had at least some education, those whose mothers had no formal education had lower weight-for-height z-scores by an average of 0.13 standard deviations. Children of Muslim mothers had an average weight-for-height z-score 0.29 standard deviations lower than children of other religions (94% of whom are Christian). Z-scores decreased slightly for every additional month of age and boys had slightly lower z-scores than girls.

	WHZ Model 1 (no covar.)			**WHZ Model 2 (all covar.)**			**WHZ Model 3 (select covar.)**		
	Coeff.	p-value	Std. Err.	Coeff.	p-value	Std. Err.	Coeff.	p-value	Std. Err.
States									
Conflict states	*ref*			*ref*			*ref*		
Non-conflict states	-0.370	0.001	0.110	-0.481	0.000	0.107	-0.473	0.000	0.105
Period									
2	*ref*			*ref*			*ref*		
008									
2013	-0.371	0.000	0.091	-0.273	0.049	0.138	-0.265	0.056	0.138
Double-Difference									
States * Period = 0	*ref*			*ref*			*ref*		

States * Period = 1	0.463	0.001	0.141	0.486	0.000	0.119	0.486	0.000	0.120
Month									
February				0.294	0.008	0.110	0.278	0.013	0.110
March				0.252	0.000	0.067	0.246	0.000	0.065
April				0.240	0.001	0.069	0.234	0.001	0.067
May				0.223	0.001	0.066	0.205	0.002	0.064
June				0.323	0.000	0.077	0.319	0.000	0.076
July				0.387	0.000	0.087	0.394	0.000	0.084
August				0.338	0.001	0.097	0.327	0.001	0.095
September				0.125	0.220	0.101	0.114	0.257	0.101
October				0.412	0.000	0.114	0.380	0.001	0.111
Altitude (m)									
Altitude				-0.001	0.036	0.001	-0.001	0.027	0.000
Altitude squared				0.000	0.010	0.000	0.000	0.007	0.000
Urban/Rural									
Rural				*ref*					
Urban				-0.094	0.745	0.288			
Urban population									
50 – 100,000				*ref*			*ref*		
100 – 500,000				0.293	0.330	0.301	0.259	0.401	0.308
> 1 million				0.805	0.009	0.304	0.721	0.020	0.309
Not urban				-	-	-	0.103	0.724	0.290
Wealth									
Wealthier 3 quintiles				*ref*					
Poorest 2 quintiles				0.140	0.067	0.076			
Water source									
Unimproved				*ref*					
Improved				0.020	0.754	0.064			
Toilet type									
Unimproved				*ref*					
Improved				-0.010	0.882	0.068			
No. people in household									
No. people				0.017	0.351	0.018			
No. people squared				-0.001	0.208	0.000			
No. under fives in household									
No. under fives				0.002	0.981	0.079			
No. under fives squared				-0.003	0.770	0.010			

Mother's occupation									
Other				*ref*					
Ag. Or not outside home				0.017	0.767	0.058			
Partner's occupation									
Other				*ref*					
Ag. Or not outside home				-0.042	0.501	0.062			
Mother's education									
Some education				*ref*			*ref*		
No formal education				-0.132	0.019	0.056	-0.133	0.011	0.052
Partner's education									
Some education				*ref*					
No formal education				-0.077	0.180	0.057			
Mother's religion									
Other				*ref*			*ref*		
Muslim				-0.252	0.010	0.097	-0.292	0.001	0.089
Child's age (months)									
Child's age				-0.018	0.003	0.006	-0.019	0.001	0.005
Child's age squared				0.000	0.000	0.000	0.000	0.000	0.000
Child's sex									
Female				*ref*			*ref*		
Male				-0.107	0.007	0.039	-0.090	0.017	0.038
Birth order									
Birth order				0.030	0.349	0.031			
Birth order squared				-0.002	0.372	0.003			
Intercept									
Constant	-0.366	0.000	0.059	-0.404	0.160	0.287	-0.271	0.460	0.366
R-squared	0.008			0.056			0.054		
F-test	0.0001			0.0000			0.0000		

Table 4.4: Results of linear regression for weight-for-height z-scores. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

Moderate or severe wasting

Table 4.5 shows the corrected marginal effects for the interaction term, which is the estimate of the doubledifference for the probability of moderate or severe wasting. Model 1 is without covariates, Model 2 has all environmental, household, and child covariates, and Model 3 has select covariates based on their significance in Model 2. The results suggest that, *ceteris paribus*, if children who were exposed to the Boko

Haram insurgency had not been exposed, the likelihood of moderate or severe wasting would decrease by 13 percentage points. The DD estimation from the logistic model before correction – about 87 percentage points - is also shown. Figure 4.4 shows these results graphically, illustrating that there is some variance in the marginal effects of the conflict on individual children, but that the overall pattern is similar. The results are statistically significant for nearly all the individual children (mean z-statistic = -4.2).

	Mod/Sev Wasting Model 1 (no covar.)				Mod/Sev Wasting Model 2 (all covar.)				Mod/Sev Wasting Model 3 (select covar.)			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Correct Interaction term (DD)	-0.157	0.000	-0.157	-0.157	-0.138	0.048	-0.224	-0.019	-0.134	0.044	-0.210	-0.026
Std. Err.	0.034	0.000	0.034	0.034	0.034	0.008	0.008	0.075	0.031	0.007	0.010	0.046
Z-statistic	-4.573	0.000	-4.573	-4.573	-3.979	0.721	-5.406	-1.357	-4.205	0.692	-5.262	-1.626
Incorrect interaction term	-0.940				-0.903				-0.867			

Table 4.5: Corrected marginal effects for the interaction term (double-difference) for moderate or severe wasting. The uncorrected interaction term is also shown for comparison. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

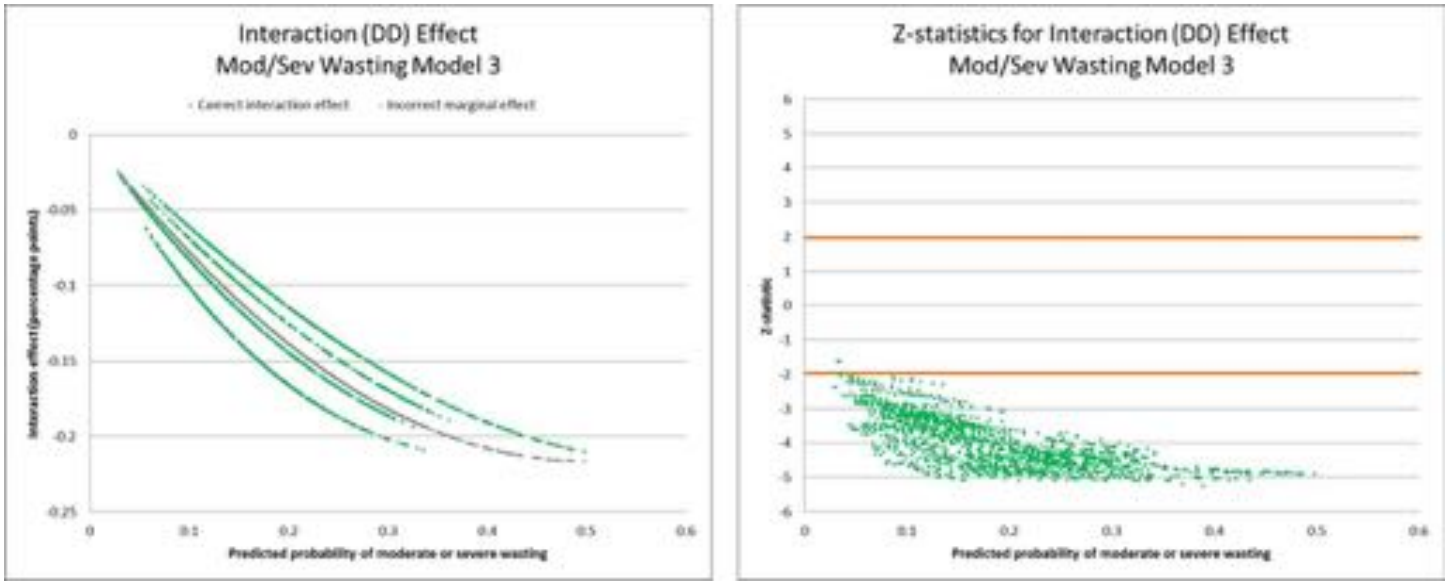


Figure 4.4: Graphic representation of incorrect and corrected marginal effects for the interaction term (double-difference) for moderate or severe wasting, Model 3 with select covariates. Left panel is the interaction effect and right panel is z-statistics for individual children.

The covariates for the logistic regression model are shown in Table 4.6, expressed as odds ratios. Overall, the effect of month of interview is more protective in the dry months (February decreased odds of 43%) than in

the wetter months (August decreased odds of 34%). Higher altitude increases the odds slightly. Living in Maiduguri decreased the odds of moderate or severe wasting by 63% compared to living elsewhere. Both the mother's and her partner's education are significant in the final model with no formal education increasing the odds of moderate or severe wasting by 22%. If the mother is Muslim, the odds increase by 34%. The age and sex of the child is not significant for this outcome.

	Mod/Sev Wasting Model 1 (no covar.)			Mod/Sev Wasting Model 2 (all covar.)			Mod/Sev Wasting Model 3 (select covar.)		
	OR	p-value	Std. Err.	OR	p-value	Std. Err.	OR	p-value	Std. Err.
States									
Conflict states	*ref*			*ref*			*ref*		
Non-conflict states	1.760	0.000	0.233	1.930	0.000	0.289	1.890	0.000	0.258
Period									
2008	*ref*			*ref*			*ref*		
2013	1.380	0.023	0.194	1.734	0.004	0.329	1.640	0.007	0.298
Month									
February				0.586	0.002	0.101	0.571	0.001	0.099
March				0.547	0.000	0.057	0.548	0.000	0.053
April				0.657	0.001	0.081	0.659	0.000	0.075
May				0.636	0.000	0.067	0.644	0.000	0.065
June				0.640	0.000	0.079	0.626	0.000	0.071
July				0.614	0.000	0.077	0.606	0.000	0.071
August				0.665	0.022	0.118	0.661	0.009	0.104
September				0.970	0.827	0.136	0.980	0.877	0.129
October				0.759	0.085	0.121	0.753	0.058	0.112
Altitude (m)									
Altitude				1.003	0.003	0.001	1.003	0.002	0.001
Altitude squared				1.000	0.003	0.000	1.000	0.002	0.000
Urban/Rural									
Rural				*ref*					
Urban				1.185	0.471	0.278			
Urban population									
50 - 100,000				1.000	(omitted)		1.000	(omitted)	
100 - 500,000				0.708	0.173	0.179	0.701	0.145	0.170
> 1 million				0.360	0.001	0.109	0.365	0.000	0.099
Not urban				1.000	(omitted)		0.847	0.427	0.177
Wealth									
Wealthier 3 quintiles				*ref*					
Poorest 2 quintiles				0.969	0.767	0.104			

Water source				*ref*					
Unimproved									
Improved				1.050	0.553	0.087			
Toilet type									
Unimproved				*ref*					
Improved				1.008	0.925	0.090			
No. people in household									
No. people				0.980	0.424	0.024			
No. people squared				1.000	0.690	0.001			
No. under fives in household									
No. under fives				1.032	0.792	0.123			
No. under fives squared				0.998	0.918	0.017			
Mother's occupation									
Other				*ref*					
Ag. or not outside home				1.062	0.463	0.087			
Partner's occupation									
Other				*ref*					
Ag. or not outside home				1.043	0.612	0.086			
Mother's education				*ref*			*ref*		
Some education									
No formal education				1.262	0.017	0.123	1.221	0.031	0.113
Partner's education									
Some education				*ref*			*ref*		
No formal education				1.235	0.007	0.096	1.229	0.007	0.093
Mother's religion				*ref*			*ref*		
Other									
Muslim				1.320	0.079	0.208	1.342	0.041	0.193
Child's age (months)									
Child's age				1.001	0.853	0.008			
Child's age squared				1.000	0.073	0.000			
Child's sex				*ref*			*ref*		
Female									
Male				1.128	0.047	0.068	1.089	0.140	0.063
Birth order									
Birth order				0.938	0.141	0.041			
Birth order squared				1.006	0.078	0.004			
Intercept									

Constant	0.214	0.000	0.019	0.140	0.000	0.064	0.128	0.000	0.052

Table 4.6: Odds ratios (OR), p-values, and standard errors for covariates of logistic regression for moderate or severe wasting. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

Weight-for-age z-scores

The results of the linear regression for weight-for-height z-scores are shown in Table 4.7. Model 1 is without covariates and Model 2 has all environmental, household, and child covariates. Model 3 has select covariates based on their significance in Model 2. As expected from the common trends analysis, the double-difference coefficient (0.02) is not statistically significant in the final model (p-value 0.9).

	WAZ Model 1 (no covar.)			**WAZ Model 2 (all covar.)**			**WAZ Model 3 (select covar.)**		
	Coeff.	p-value	Std. Err.	Coeff.	p-value	Std. Err.	Coeff.	p-value	Std. Err.
States									
Conflict states				*ref*			*ref*		
Non-conflict states	-0.020	0.524	0.031	-0.342	0.000	0.083	-0.338	0.000	0.079
Period									
2008				*ref*			*ref*		
2013	0.094	0.017	0.039	0.233	0.077	0.131	0.234	0.073	0.130
Double-Difference									
States * Period = 0				*ref*			*ref*		
States * Period = 1	-0.165	0.002	0.052	0.020	0.852	0.106	0.016	0.878	0.106
Month									
February				0.230	0.021	0.099	0.220	0.030	0.101
March				0.130	0.024	0.057	0.110	0.058	0.058
April				0.119	0.043	0.058	0.107	0.067	0.058
May				0.143	0.013	0.058	0.125	0.031	0.058
June				0.269	0.000	0.059	0.246	0.000	0.057
July				0.215	0.002	0.067	0.196	0.003	0.065
August				0.260	0.000	0.066	0.234	0.000	0.063
September				0.185	0.004	0.064	0.162	0.012	0.064
October				0.390	0.000	0.102	0.360	0.000	0.097
Altitude (m)									
Altitude				-0.001	0.033	0.000	-0.001	0.012	0.000
Altitude squared				0.000	0.026	0.000	0.000	0.008	0.000
Urban/Rural									
Rural				*ref*					

Urban				-0.539	0.023	0.235			
Urban population									
50 - 100,000				*ref*			*ref*		
100 - 500,000				0.593	0.015	0.243	0.557	0.025	0.247
> 1 million				1.029	0.000	0.246	0.953	0.000	0.251
Not urban				-	-	-	0.463	0.053	0.238
Wealth									
Wealthier 3 quintiles				*ref*			ref		
Poorest 2 quintiles				-0.140	0.057	0.074	-0.162	0.023	0.071
Water source									
Unimproved				*ref*					
Improved				0.075	0.185	0.056			
Toilet type									
Unimproved				*ref*					
Improved				0.036	0.468	0.049			
No. people in household									
No. people				-0.017	0.228	0.014			
No. people squared				0.000	0.300	0.000			
No. under fives in household									
No. under fives				0.066	0.164	0.047			
No. under fives squared				-0.010	0.105	0.006			
Mother's occupation									
Other				*ref*					
Ag. or not outside home				0.000	0.999	0.044			
Partner's occupation									
Other				*ref*					
Ag. or not outside home				0.007	0.893	0.051			
Mother's education									
Some education				*ref*			*ref*		
No formal education				-0.140	0.007	0.052	-0.173	0.000	0.047
Partner's education									
Some education				*ref*					
No formal education				-0.031	0.487	0.045			
Mother's religion									
Other				*ref*			*ref*		
Muslim				-0.273	0.001	0.083	-0.259	0.001	0.078
Child's age (months)									
Child's age				-0.069	0.000	0.005	-0.069	0.000	0.005
Child's age squared				0.001	0.000	0.000	0.001	0.000	0.000

Child's sex									
Female				*ref*			*ref*		
Male				-0.134	0.000	0.035	-0.126	0.000	0.033
Birth order									
Birth order				0.013	0.556	0.023			
Birth order squared				-0.001	0.688	0.002			
Intercept									
Constant	-1.343	0.000	0.022	-0.168	0.454	0.224	-0.495	0.093	0.294
R-squared	0.002			0.107			0.105		

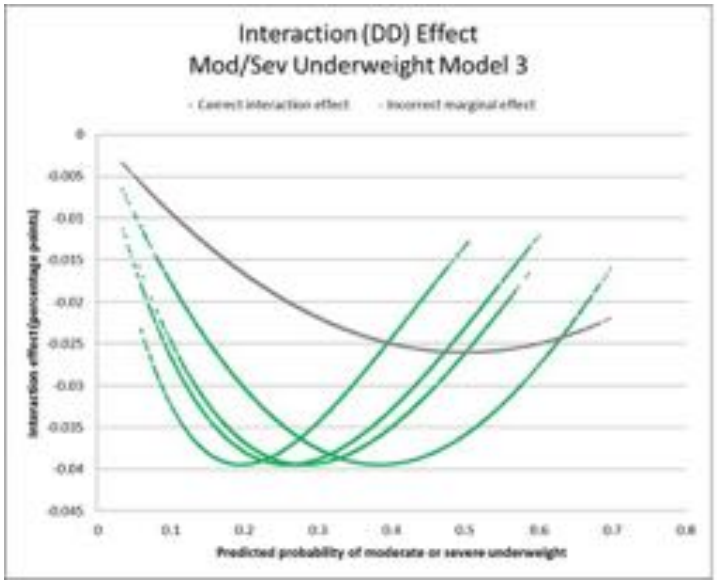
Table 4.7: Results of linear regression for weight-for-age z-scores. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

Moderate or severe underweight

Table 4.8 shows the corrected marginal effects for the interaction term, which is the estimate of the doubledifference for the probability of moderate or severe underweight. Model 1 is without covariates, Model 2 has all environmental, household, and child covariates, and Model 3 has select covariates based on their significance in Model 2. Also as expected from the common trends analysis, the double-difference estimate of -0.03 is not statistically significant for any individual child (mean z-statistic range -1.8 to -0.3). Figure 4.5 shows these results graphically, and the odds ratios for the covariates are shown in Table 4.9.

	Mod/Sev Underweight Model 1 (no covar.)				**Mod/Sev Underweight Model 2 (all covar.)**				**Mod/Sev Underweight Model 3 (select covar.)**			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Correct Interaction term (DD)	0.000	0.000	0.000	0.000	-0.038	0.006	-0.044	-0.007	-0.034	0.006	-0.040	-0.007
Std. Err.	0.038	0.000	0.038	0.038	0.032	0.006	0.005	0.039	0.031	0.007	0.004	0.038
Z-statistic	-0.001	0.000	-0.001	-0.001	-1.242	0.267	-1.914	-0.426	-1.118	0.285	-1.768	-0.347
Incorrect interaction term	0.016				-0.129				-0.104			

Table 4.8: Corrected marginal effects for the interaction term (double-difference) for moderate or severe underweight. The uncorrected interaction term is also shown for comparison. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.



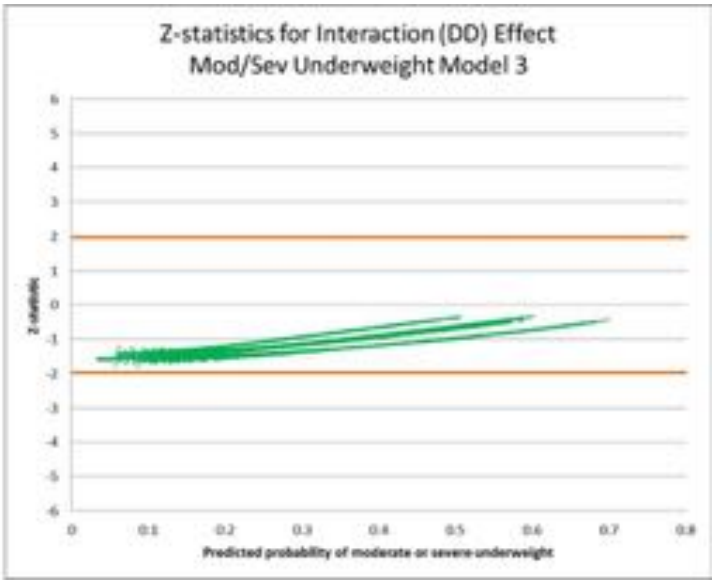


Figure 4.5: Graphic representation of incorrect and corrected marginal effects for the interaction term (double-difference) for moderate or severe underweight, Model 3 with select covariates. Left panel is the interaction effect and right panel is z-statistics for individual children.

		Mod/Sev Underweight Model (no covar.)			Mod/Sev Underweight Model 2 (all covar.)			Mod/Sev Underweight Model 3 (select covar.)		
		OR	p-value	Std. Err.	OR	p-value	Std. Err.	OR	p-value	Std. Err.
States										
	Conflict states	*ref*			*ref*			*ref*		
	Non-conflict states	1.284	0.029	0.146	1.588	0.000	0.190	1.590	0.000	0.182
Period										
	2008	*ref*			*ref*			*ref*		
	2013	0.827	0.115	0.099	0.625	0.018	0.123	0.622	0.016	0.122
Month										
	February				0.678	0.016	0.109	0.675	0.014	0.108
	March				0.707	0.000	0.059	0.714	0.000	0.061
	April				0.784	0.002	0.061	0.782	0.002	0.062
	May				0.787	0.008	0.070	0.787	0.009	0.071
	June				0.574	0.000	0.065	0.570	0.000	0.062
	July				0.624	0.000	0.062	0.630	0.000	0.058
	August				0.605	0.000	0.064	0.609	0.000	0.058
	September				0.661	0.000	0.067	0.670	0.000	0.071
	October				0.486	0.000	0.084	0.487	0.000	0.078
Altitude (m)										
	Altitude				1.001	0.033	0.001	1.001	0.030	0.001
	Altitude squared				1.000	0.025	0.000	1.000	0.018	0.000
Urban/Rural										
	Rural				*ref*					
	Urban				1.481	0.148	0.401			
Urban population										
	50 - 100,000				1.000		(omitted)	0.000		(omitted)
	100 - 500,000				0.582	0.064	0.169	0.573	0.055	0.166
	> 1 million				0.311	0.000	0.089	0.320	0.000	0.088
	Not urban				1.000		(omitted)	0.740	0.259	0.266
Wealth										
	Wealthier 3 quintiles				*ref*					
	Poorest 2 quintiles				1.127	0.310	0.132			
Water source					*ref*					
	Unimproved									

Improved				0.923	0.360	0.081			
Toilet type									
Unimproved				*ref*					
Improved				1.003	0.967	0.071			
No. people in household									
No. people				1.034	0.149	0.024			
No. people squared				0.999	0.509	0.001			
No. under fives in household									
No. under fives				0.810	0.006	0.061	0.856	0.024	0.059
No. under fives squared				1.024	0.015	0.010	1.022	0.019	0.009
Mother's occupation				*ref*					
Other									
Ag. or not outside home				0.943	0.371	0.062			
Partner's occupation									
Other				*ref*					
Ag. or not outside home				1.042	0.554	0.072			
Mother's education				*ref*			*ref*		
Some education									
No formal education				1.346	0.001	0.114	1.474	0.000	0.106
Partner's education									
Some education				*ref*					
No formal education				1.070	0.291	0.068			
Mother's religion				*ref*			*ref*		
Other									
Muslim				1.310	0.021	0.153	1.281	0.024	0.140
Child's age (months)									
Child's age				1.085	0.000	0.008	1.086	0.000	0.007
Child's age squared				0.999	0.000	0.000	0.999	0.000	0.000
Child's sex				*ref*			*ref*		
Female									
Male				1.183	0.002	0.063	1.166	0.004	0.061
Birth order									
Birth order				0.978	0.523	0.035			
Birth order squared				1.001	0.768	0.003			
Intercept									
Constant	0.473	0.000	0.033	0.187	0.000	0.061	0.264	0.000	0.094

Table 4.9: Odds ratios (OR) for covariates of logistic regression for moderate or severe underweight. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

Diarrhea prevalence

Table 4.10 shows the corrected marginal effects for the interaction term, which is the estimate of the doubledifference for the probability of diarrhea. Model 1 is without covariates, Model 2 has all environmental, household, and child covariates, and Model 3 has select covariates based on their significance in Model 2. The results suggest that, *ceteris paribus*, if children who were exposed to the Boko Haram insurgency had not been exposed, the likelihood of diarrhea would decrease by 8 percentage points. The DD estimation from the logistic model before correction – about 44 percentage points - is also shown. Figure 4.6 shows these results graphically, illustrating that there is some variance in the marginal effects of the conflict on individual children, but that the overall pattern is similar. The results are statistically significant for all the individual children (mean z-statistic = -3.3; max z-statistic -2.0).

	Diarrhea Model 1 (no covar.)				**Diarrhea Model 2 (all covar.)**				**Diarrhea Model 3 (select covar.)**			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Correct Interaction term (DD)	-0.045	0.000	-0.045	-0.045	-0.081	0.027	-0.113	-0.005	-0.082	0.027	-0.112	-0.005
Std. Err.	0.028	0.000	0.028	0.028	0.026	0.009	0.002	0.043	0.025	0.009	0.002	0.041
Z-statistic	-1.617	0.000	-1.617	-1.617	-3.185	0.257	-3.826	-1.847	-3.332	0.284	-3.947	-1.995
Incorrect interaction term	-0.272				-0.443				-0.435			

Table 4.10: Corrected marginal effects for the interaction term (double-difference) for diarrhea prevalence. The uncorrected interaction term is also shown for comparison. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

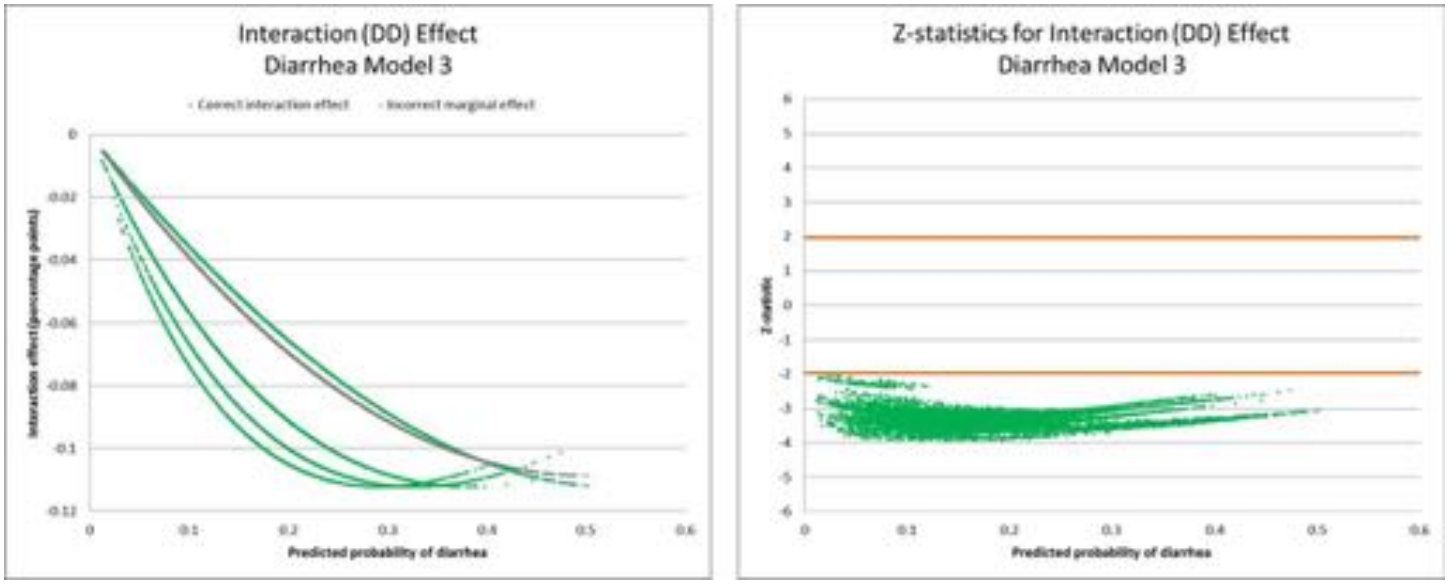


Figure 4.6: Graphic representation of incorrect and corrected marginal effects for the interaction term (double-difference) for diarrhea prevalence, Model 3 with select covariates. Left panel is the interaction effect and right panel is z-statistics for individual children.

The odds ratios for the covariates are shown in Table 4.11. Overall, the effect of month of interview is more protective in the months with generally higher rainfall (October decreased odds of 57%) than in the drier months (August decreased odds of 3%). Altitude was not significant in the final model. Compared to children in households in the wealthier three quintiles, children in households in the poorer two quintiles had increased odds of 38%. Improved water sources decreased odds by 12%, while toilet type was not significant. Here, both the mother's and her partner's occupation are significant, decreasing the odds of diarrhea by 23% and 17%, respectively, but their educational attainment is not significant in this model. Similar to wasting, if the mother is Muslim, the odds of diarrhea increase by 31%. Age is significant for diarrhea, with 5% increasing risk for every additional month. Boys had about 11% higher odds of diarrhea than girls.

	Diarrhea Model 1 (no covar.)			Diarrhea Model 2 (all covar.)			Diarrhea Model 3 (select covar.)		
	OR	p-value	Std. Err.	OR	p-value	Std. Err.	OR	p-value	Std. Err.
States									
Conflict states	*ref*			*ref*			*ref*		
Non-conflict states	1.496	0.000	0.161	1.775	0.000	0.184	1.818	0.000	0.184
Period									
2008	*ref*			*ref*			*ref*		
2013	1.169	0.263	0.163	0.693	0.084	0.147	0.670	0.056	0.140
Month									
February				0.945	0.593	0.101	0.974	0.798	0.101
March				0.850	0.119	0.088	0.879	0.223	0.093
April				0.764	0.012	0.081	0.784	0.018	0.080
May				0.837	0.080	0.085	0.863	0.133	0.084
June				0.691	0.000	0.065	0.702	0.000	0.062
July				0.622	0.000	0.059	0.635	0.000	0.058
August				0.495	0.000	0.045	0.498	0.000	0.047
September				0.439	0.000	0.048	0.449	0.000	0.048
October				0.428	0.000	0.073	0.430	0.000	0.070
Altitude (m)									
Altitude				0.999	0.056	0.001	0.999	0.088	0.001
Altitude squared				1.000	0.060	0.000	1.000	0.084	0.000
Urban/Rural									
Rural				*ref*					
Urban				0.844	0.306	0.140			
Urban population									
50 - 100,000				1.000		(omitted)			
100 - 500,000				1.153	0.505	0.246			
> 1 million				1.010	0.972	0.275			
Not urban				1.000		(omitted)			
Wealth									
Wealthier 3 quintiles				*ref*			ref		
Poorest 2 quintiles				1.425	0.000	0.131	1.381	0.001	0.131
Water source									
Unimproved				*ref*			ref		
Improved				0.871	0.083	0.069	0.878	0.098	0.069
Toilet type									
Unimproved				*ref*					
Improved				0.952	0.526	0.074			
No. people in household									
No. people				1.019	0.412	0.023			
No. people squared				1.000	0.978	0.001			
No. under fives in household									
No. under fives				0.901	0.251	0.082			
No. under fives squared				1.014	0.277	0.013			
Mother's occupation									
Other				*ref*			ref		
Ag. or not outside home				0.788	0.001	0.055	0.772	0.000	0.052
Partner's occupation				*ref*			ref		
Other									
Ag. or not outside home				0.811	0.010	0.065	0.830	0.022	0.067
Mother's education				*ref*					
Some education									
No formal education				0.914	0.285	0.077			
Partner's education				*ref*					
Some education									

	No formal education				0.906	0.188	0.068			
Mother's religion					*ref*					
	Other									
	Muslim						0.147			0.135
					1.401	0.001		1.315	0.008	
Child's age (months)										
	Child's age				1.049	0.000	0.007	1.049	0.000	0.007
	Child's age squared				0.999	0.000	0.000	0.999	0.000	0.000
Child's sex					*ref*			*ref*		
	Female									
	Male				1.116	0.020	0.052	1.110	0.032	0.054
Birth order										
	Birth order				1.045	0.251	0.040			
	Birth order squared				0.999	0.732	0.003			
Intercept										
	Constant	0.218	0.000	0.019	0.459	0.023	0.156	0.465	0.007	0.132

Table 4.11: Odds ratios (OR) for covariates of logistic regression for diarrhea prevalence. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

4.4 Discussion

This study finds significant double-difference estimates for average weight-for-height z-scores, prevalence of moderate or severe wasting, and prevalence of diarrhea. In a counterfactual scenario where children exposed to the Boko Haram conflict had not been exposed, the estimates indicate there would have been improved health outcomes for these measures. Because of potential unidentified confounding, this research cannot conclude that the conflict caused negative health outcomes; however, it does demonstrate that the children exposed to the conflict had a different and detrimental experience compared to children not exposed to the conflict.

Non-significant double-difference estimates were found for average weight-for-age z-scores and prevalence of moderate or severe underweight. Double-difference analysis was found to not be appropriate for these data for height-for-age or moderate or severe stunting.

This research suggests that if children who were affected by the Boko Haram insurgency in Northeast Nigeria had not experienced the conflict, they would have weight-for-height z-scores an estimated 0.49 standard deviations higher than they are. This would be a significant improvement; in 2013, the average weight-forheight z-score in the Northeast was -0.69 (SD 1.62) and in the conflict states it was -0.74 (SD 1.8). For children already in the range of normal weight-for-height (generally -1 to +2 standard deviations from the reference population), this would not be a large difference. However for marginally wasted children (-1 to -2 SD) and especially vulnerable children below -2 standard deviations, this increase would mean better short-term health, increased resistance to other illnesses, and reduced risk of mortality. It should be noted that increased z-scores are generally a positive sign in the developing world; however, overweight and obesity is a growing concern.[53] In this area, about 7% of children are classified as high range weight-for height (+2 SD or more).

The weight-for-height models have several significant coefficients, but low r-squared terms, which indicate that the data have high variability but that the explanatory covariables still provide information about the outcome. Thus, while these models have little predictive precision, the objective of the analysis – to determine whether there are before-after effects due to conflict – is accomplished.

This analysis also estimates with a high degree of significance that the prevalence of moderate or severe wasting would have been 13 percentage points lower in the absence of conflict in Northeast Nigeria. This too would be an important difference, bringing the proportion down from 23% to 10%, where the average proportion for all of West Africa is 9%.[54,55] This would reduce the proportion of children at risk of dying from malnutrition and co-morbidities and would help ensure a healthier and more productive adult population in the future.

In terms of international guidelines, the absence of conflict in Northeast Nigeria would move the nutritional crisis there from "serious" to "poor" for average z-scores and from "critical" to "serious" for prevalence of moderate or severe wasting (see Table 4.12).

Severity of Nutritional Crisis	Mean weight-for-height z-score	Prevalence of moderate or severe wasting
Acceptable	> -0.40	< 5%
Poor	-0.40 to -0.69	5 – 9%
Serious	-0.70 to -0.99	10 – 14%
Critical	≤ -1.00	≥ 15%

Table 4.12: Nutritional crisis classifications. Adapted from the World health Organization (2000).[54]

The counterfactual scenario also holds true for diarrhea prevalence: if children who were affected by the Boko Haram insurgency in Northeast Nigeria had not experienced the conflict, their prevalence of diarrhea would have been 8 percentage points lower than it is. This would have brought the prevalence down from the current 20% in the conflict states to 12%, close to the national average of 10%.[25] This decrease would mean that children were not suffering from diarrheal episodes as often, but also that their gastrointestinal and immune systems were not being compromised, perhaps leading to fewer infections and better growth and development.

The reasons for how the conflict affected child nutrition and illness is not fully known, but news reports from around the time of the 2013 survey give some sense of the atmosphere in the conflict areas. There are reports of indiscriminate executions of ordinary people, suicide attacks killing scores of people in buses, the kidnapping of local and foreign civilians, the burning down of towns, and attacks on schools resulting in the deaths of students and teachers.[56] Men were fleeing forced conscription by Boko Haram and civilian groups formed to fight the insurgents.[56] There were several prison breaks at this time as police stations and military

patrols were bombed and Boko Haram commanders were killed.[56] After the state of emergency was declared, telephone service were shut down in Borno and Yobe.[56]

Reports from the Famine Early Warning Systems Network illustrate growing food insecurity during this time.[57] In March 2013, Yobe, Borno, Adamawa, and Taraba (a non-conflict state) were considered "stressed" due to population displacement and below average harvest yields.[57] Security measures such as checkpoints reduced population movements and increased transportation costs.[57] Traders and their customers were concerned about their safety in markets, which reduced food stocks and overall market functioning.[57] By the time the state of emergency was declared in May, Yobe and Borno states were elevated to "crisis" stage, as poor households faced depleted food stocks and acute food insecurity.[57]

From the perspective of 2016, this was the start of a worsening humanitarian crisis which is marked by fear, displacement, families split apart, disrupted services such as health care, schools, and maintenance of infrastructure, and limited access by local and international humanitarian assistance organizations, especially to more remote areas.[26] This led to a malnutrition crisis, which was already identified in February 2012 as food insecurity increased and childhood illnesses exacerbated by malnutrition went untreated in many cases.[26] Without these effects, children would have had more stability, improved nutrition, and better health.

In double-difference analysis, covariates are included to improve the models, but their coefficients are secondary in importance to the double-difference coefficient. However, the significant covariates in the regression models - month of interview, altitude, urban population, wealth, water source, occupation, education, religion, and age and sex of the child - also offer insight into what factors contributed to child health in this setting. For weight-for-height z-scores and diarrhea prevalence, the rainy season was more favorable, while for likelihood of moderate or severe wasting, the dry season was more favorable. This could

be due to different seasonal dynamics affecting the whole child population as opposed to the most vulnerable. A healthy child may gain weight if food security improves in the rainy season from a household garden, for example. But a child who is already marginally wasted from recent illness may lose weight by the end of the rainy season if last year's stores are low and this year's harvest is not yet in (often referred to as "the lean season"). This is consistent with findings that mortality often peaks at the end of the rainy season.[58] Additionally, diarrhea prevalence may decrease with moderate rainfall if water sources are plentiful and there is enough recharge to dilute pathogens. Increased altitude is consistent with poorer outcomes in both the linear and logistic regression models, perhaps reflecting better year-round food security in the lowest elevation areas where people fish in the Benue River as opposed to the less densely populated highlands where people rely on corn, sorghum and cash crops like cotton.[59] Urban/rural classification was not significant, but living in the largest city, Maiduguri, was protective for weight-for-height and moderate/severe wasting. This speaks to the dual role of Maiduguri as the stronghold of Boko Haram, but also as a place relatively conducive to child health. Sub-Saharan Africa has instances of both "urban advantage" and "urban disadvantage" – at least for this city and for weight-for-height, Maiduguri seems to fall in the former category.[60]

Most of the household variables were not significant in these analyses. In addition to the environmental variables, what seems to be more important are the characteristics of the mother and her partner (likely often the child's father). If the mother had some education, her children have significantly better weight-for-height and moderate/severe wasting outcomes, consistent with other studies.[2] In this population, among mothers with some education, the majority (56%) have only at least some primary schooling, which suggests even minimal education can make a difference in child health outcomes. For moderate/severe wasting, the partner's education also contributed to positive outcomes. This is a less studied field, but reflects the contribution of the partner whether directly or not, even after controlling for the mother's own education, on

a child's health.[61] For diarrhea, household wealth, both the mother and her partner's occupation, and water source were significant, indicating that children in poor, agriculture-dependent households that do not have reliable access to clean water are vulnerable to this disease. Having a Muslim mother lowered the average weight-for-height z-scores and increased the likelihood of moderate or severe wasting and diarrhea, indicating that although they are the majority population, children in Muslim families do not fare better than their Christian counterparts.

Age of the child is significant for weight-for-height z-scores (slightly decreasing average z-scores for an increase of one month in age) and diarrhea prevalence (slightly increasing odds with age). This could indicate that children are more vulnerable to food insecurity as they are weaned, and that overall, increasing exposure to pathogens as they become more independent makes them vulnerable to infection. Boys had slightly lower weight-for-height z-scores than girls and higher odds of diarrhea.

An important aspect of this study was to use common trends analysis to determine which outcomes would provide valid results with DD analysis. Height-for-age and stunting were deemed inappropriate for DD analysis as their diverging trends before the start of the insurgency means that there were other unobserved dynamics driving this outcome over time, independent of the conflict. For the purposes of completeness, the results are shown in the Appendix. As seen in the Appendix Table 4.1, the double-difference height-for-age z-score estimation is -0.60 and statistically significant, meaning children affected by conflict would have had *lower* zscores if there had been no conflict. Similarly, the double-difference estimate for moderate or severe stunting is positive (there would have been 8 percentage points *more* stunting in the absence of conflict) and significant (Appendix Table 4.2, Appendix Figure 4.1, and Appendix Table 4.3).

In addition to common trends, an assumption of DD analysis is that the intervention is not related to the outcome at the baseline period; i.e., the conflict was not driven by especially poor child health outcomes. While poverty is certainly a driving factor in the rise of Boko Haram, the conflict states are more prosperous than the non-conflict states as seen in the descriptive statistics (Table 4.2), so this assumption is largely met.[19] These findings support the original hypotheses regarding for weight-for-height, wasting, and diarrhea; that if children exposed to conflict had not been exposed, there would be significant improvements in terms of both z-scores and proportion with moderate/severe wasting or diarrhea. As hypothesized, findings were limited for weight-for-age/underweight and height-for-age/stunting. The trends before the crisis were not improving overall as hypothesized, likely because there were limited time periods.

There are several limitations associated with this study. Most importantly is that there is likely unidentified confounding where certain factors influence both conflict and health outcomes. Thus the associations between conflict and malnutrition/diarrhea found here should not be interpreted as causality. Another limitation is that Boko Haram is not the only cause of violence in the Northeast and there could be other unobserved dynamics that affect the results, for example what is referred to as inter-communal violence largely along religious affiliations.[18] This leads to the difficulties of finding an appropriate comparison group. Using the six states within the Northeast zone was chosen because this better preserved the sampling method of the surveys and the timing of the interviews is narrower. However, a future study could test the robustness of the results by using an alternative comparison group such as states in the Northwest.[25] There were limitations with the common trends analysis because were only two previous surveys; additional timepoints may have shown clearer trends, especially for stunting. The timing and content of the 2013 survey was both fortuitous and doubtless with its challenges. Interviewers were capturing real-time events in their data that likely reflect acute changes in child health, but they were perhaps impeded or rushed in some areas which may bias results. Although the number of weighted observations in 2013 is less than in 2008 (Table 4.3), the

percent of missing observations is actually less in 2013. Still, it is unknown whether the missing data for malnutrition biased the results. A specific point about the 2013 survey is that the displacement or migration history of households is not known. It is equally possible that those with means or that the most vulnerable left the Northeast or moved to Maiduguri, making the direction of any bias difficult to determine.[62] Also, DHS does not measure nutritional edema, which may lead to an underestimate of wasting and underweight (for example, among the 7% of children who are classified as high range weight-for-height).[63]

4.5 Conclusion

This study used double-difference (DD) methodology to estimate the effect of the Boko Haram insurgency in Northeast Nigeria on child malnutrition and diarrhea. The differences in outcomes among two groups – those in conflict and non-conflict areas and in two periods – before and after the start of the conflict – were compared using household survey data from the Demographic and Health Surveys. Visualization of common trends from 1990 through 2013 showed that weight-for-height/wasting, weight-for-age/underweight, and diarrhea prevalence outcomes were plausibly linked to the insurgency while height-for-age/stunting outcomes were not. Linear regression – the more typical model for DD analysis – using weight-for-height z-scores showed that in the counterfactual scenario where children affected by conflict were not affected by conflict, average z-scores would be 0.49 standard deviations higher. A logistic model to estimate the likelihood of moderate or severe wasting also finds improved results in the counterfactual scenario – a reduction by 13 percentage points of children in this high-risk category. Likewise, a logistic model to estimate the prevalence of diarrhea finds that in the absence of conflict, there would have been a reduction of 8 percentage points. These results bring child health outcomes closer to the national and sub-regional averages. The DD estimates were statistically significant without covariates, but their inclusion improves the model and shows the relative influence of factors such as the age and sex of the child, the education, occupation and religion of the mother, living in a major city, seasonality, and altitude on child health outcomes.

The counterfactual scenario for this study – a child growing up in a generally poor, but peaceful environment – can be based on what is already known about these situations. Children in poor countries and poor areas of the world already face enormous risks. When conflict erupts, an already fragile existence can be made even more unstable. Malnutrition and diarrheal disease are complex conditions which can be brought on or exacerbated in many ways related to conflict from increased food insecurity if crops are burned, food prices rise, or caregivers are abducted or conscripted, to a case of dysentery going untreated because health care facilities have shut down, there are no proper medications, or the family must put their dwindling resources elsewhere. Thus, this research does not purport that conflict is the only challenge for young children in the developing world, but it illustrates quantitatively that exposing them to armed conflict increases the risk of morbidity and potentially, mortality. Causal linkages between conflict and malnutrition/diarrhea should be viewed with caution due to likely unidentified confounding, but further research is merited to help safeguard the health of children in extreme circumstances.

The prevention and treatment of illness and injury in children is a fundamental responsibility for those engaged in humanitarian activities, whether they are government entities, insurgents, or local and international aid agencies.[64] The results of this study underscore the importance of maternal and child health interventions to reduce morbidity and excess mortality in conflict zones. Each situation is unique and care must be taken to avoid inadvertently causing harm (for example, if providing food makes people targets of violent attacks), but activities that address malnutrition and diarrheal disease generally include:

- Prioritizing pregnant and breastfeeding women for interventions aimed at providing food, cash or voucher transfers, or other types of nutritional support.
- Providing pregnant and breastfeeding women with micronutrient supplementation such as folic acid and iron.

- Encouraging the early initiation of exclusive breastfeeding, exclusive breastfeeding for 6 months, continued breastfeeding for 24 months or beyond, and the introduction of adequate and safe complementary food at 6 months.
- Ensuring nutritional and health support for especially vulnerable children such as orphans.
- Managing moderate malnutrition, often with supplementary food rations.
- Managing severe malnutrition with the treatment of co-morbidities as necessary.
- Controlling communicable diseases such as diarrhea (with oral rehydration therapy, zinc), acute respiratory infections, and vaccine-preventable diseases including measles.
- Providing safe water, appropriate sanitation facilities, adequate shelter, cooking utensils, soap for handwashing, etc.
- Addressing long-term issues of food insecurity (such as by supporting primary food production), unemployment, poverty, and weak governance.[64]

4.6 Appendix

This Appendix contains the results of analyses conducted for height-for-age and moderate/severe stunting. As mentioned in the Discussion section, the results are statistically significant, but not valid in this analysis as the trend cannot be attributed to the Boko Haram conflict.

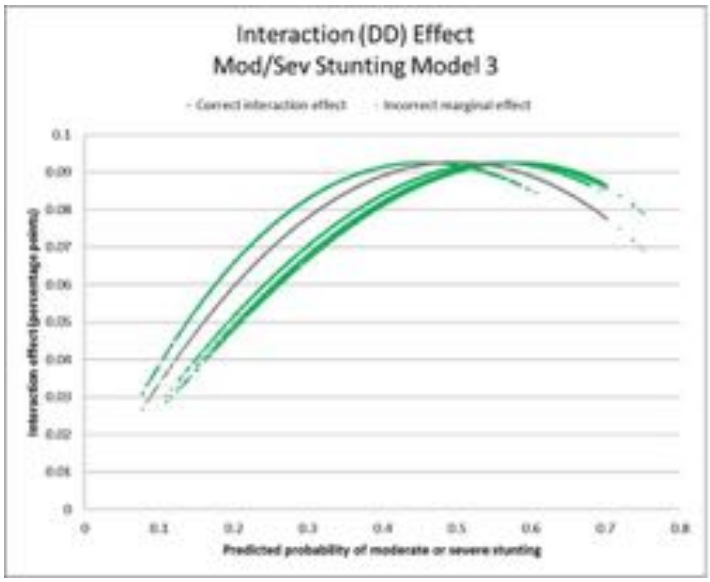
	HAZ Model 1 (no covar.)			HAZ Model 2 (all covar.)			HAZ Model 3 (select covar.)		
	Coeff.	p-value	Std. Err.	Coeff.	p-value	Std. Err.	Coeff.	p-value	Std. Err.
States									
Conflict states	*ref*			*ref*			*ref*		
Non-conflict states	0.045	0.688	0.113	-0.040	0.734	0.119	0.009	0.936	0.111
Period									
2008	*ref*			*ref*			*ref*		
2013	0.653	0.000	0.144	0.747	0.002	0.242	0.626	0.000	0.148
Double-Difference									
States * Period = 0	*ref*			*ref*			*ref*		
States * Period = 1	-0.693	0.000	0.172	-0.537	0.001	0.166	-0.604	0.001	0.174
Month									
February				0.052	0.652	0.114			
March				-0.087	0.381	0.099			
April				-0.077	0.416	0.094			
May				-0.004	0.965	0.098			
June				0.089	0.373	0.100			
July				-0.081	0.361	0.088			
August				0.060	0.592	0.112			
September				0.180	0.108	0.111			
October				0.201	0.138	0.135			
Altitude (m)									
Altitude				0.000	0.908	0.001			
Altitude squared				0.000	0.800	0.000			
Urban/Rural									
Rural				*ref*					
Urban				-0.807	0.002	0.253			
Urban population									
50 - 100,000				*ref*					
100 - 500,000				0.676	0.015	0.275			
> 1 million				0.830	0.005	0.293			
Not urban				-	-	-			
Wealth									
Wealthier 3 quintiles				*ref*			ref		
Poorest 2 quintiles				-0.395	0.000	0.103	-0.397	0.000	0.081
Water source									
Unimproved				*ref*					
Improved				0.087	0.312	0.086			
Toilet type									
Unimproved				*ref*					
Improved				0.059	0.492	0.086			
No. people in household									
No. people				-0.046	0.050	0.023	-0.046	0.015	0.019
No. people squared				0.001	0.067	0.001	0.002	0.046	0.001
No. under fives in household									
No. under fives				0.122	0.148	0.084			
No. under fives squared				-0.016	0.143	0.011			

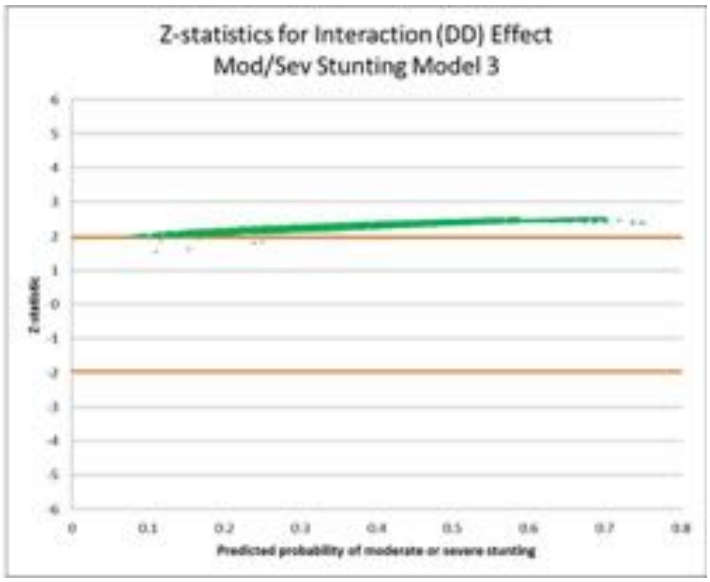
Mother's occupation									
Other				*ref*					
Ag. or not outside home				-0.011	0.863	0.066			
Partner's occupation									
Other				*ref*					
Ag. or not outside home				0.069	0.365	0.076			
Mother's education									
Some education				*ref*					
No formal education				-0.088	0.202	0.069			
Partner's education									
Some education				*ref*					
No formal education				0.039	0.556	0.066			
Mother's religion									
Other				*ref*					
Muslim				-0.159	0.134	0.106			
Child's age (months)									
Child's age				-0.122	0.000	0.006	-0.122	0.000	0.006
Child's age squared				0.002	0.000	0.000	0.002	0.000	0.000
Child's sex									
Female				*ref*			*ref*		
Male				-0.204	0.000	0.050	-0.205	0.000	0.048
Birth order									
Birth order				-0.015	0.679	0.037			
Birth order squared				0.002	0.623	0.003			
Intercept									
Constant	-1.786	0.000	0.088	0.411	0.234	0.345	0.455	0.004	0.156
R-squared	0.014			0.123			0.110		

Appendix Table 4.1: Results of linear regression for height-for-age. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

	Mod/Sev Stunting Model 1 (no covar.)				**Mod/Sev Stunting Model 2 (all covar.)**				**Mod/Sev Stunting Model 3 (select covar.)**			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Correct Interaction term (DD)	0.109	0.000	0.109	0.109	0.074	0.013	0.014	0.084	0.084	0.012	0.029	0.092
Std. Err.	0.037	0.000	0.037	0.037	0.036	0.004	0.010	0.041	0.036	0.004	0.015	0.039
Z-statistic	2.953	0.000	2.953	2.953	2.058	0.215	1.225	2.399	2.337	0.116	1.537	2.505
Incorrect interaction term	0.449				0.335				0.370			

Appendix Table 4.2: Corrected marginal effects for the interaction term (double-difference) for moderate or severe stunting. The uncorrected interaction term is also shown for comparison. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.





Appendix Figure 4.1: Graphic representation of incorrect and corrected marginal effects for the interaction term (doubledifference) for moderate or severe stunting, Model 3 with select covariates. Left panel is the interaction effect and right panel is zstatistics for individual children.

	Mod/Sev Stunting Model 1 (no covar.)			Mod/Sev Stunting Model 2 (all covar.)			Mod/Sev Stunting Model 3 (select covar.)		
	OR	p-value	Std. Err.	OR	p-value	Std. Err.	OR	p-value	Std. Err.
States									
Conflict states	*ref*			*ref*			*ref*		
Non-conflict states	1.007	0.949	0.104	1.120	0.318	0.127	1.034	0.767	0.117
Period									
2008				*ref*			*ref*		
2013	0.606	0.000	0.068	0.628	0.013	0.117	0.622	0.000	0.072
Month									
February				0.766	0.020	0.087			
March				0.871	0.155	0.084			
April				0.905	0.269	0.081			
May				0.867	0.159	0.087			
June				0.806	0.028	0.079			
July				0.974	0.755	0.083			
August				0.882	0.184	0.083			
September				0.745	0.003	0.074			
October				0.776	0.037	0.094			
Altitude (m)									
Altitude				1.000	0.690	0.001			
Altitude squared				1.000	0.903	0.000			
Urban/Rural									
Rural				*ref*			ref		
Urban				1.678	0.012	0.345	1.351	0.260	0.359
Urban population									
50 - 100,000				1.000		(omitted)	1.000		(omitted)
100 - 500,000				0.722	0.150	0.163	0.843	0.555	0.243
> 1 million				0.471	0.002	0.114	0.579	0.067	0.172
Not urban				1.000		(omitted)	1.000		(omitted)
Wealth				*ref*			ref		
Wealthier 3 quintiles									
Poorest 2 quintiles				1.489	0.000	0.143	1.472	0.000	0.133
Water source				*ref*					
Unimproved									

Improved				0.962	0.626	0.077			
Toilet type				*ref*					
Unimproved									
Improved				0.974	0.718	0.070			
No. people in household									
No. people				1.038	0.077	0.022	1.036	0.030	0.017
No. people squared				0.999	0.073	0.001	0.999	0.067	0.001
No. under fives in household									
No. under fives				0.900	0.167	0.068			
No. under fives squared				1.015	0.154	0.011			
Mother's occupation				*ref*					
Other									
Ag. or not outside home				0.979	0.743	0.062			
Partner's occupation				*ref*					
Other									
Ag. or not outside home				1.000	0.997	0.074			
Mother's education				*ref*			*ref*		
Some education									
No formal education				1.182	0.015	0.080	1.295	0.000	0.081
Partner's education				*ref*					
Some education									
No formal education				0.984	0.809	0.064			
Mother's religion				*ref*					
Other									
Muslim				1.188	0.108	0.127			
Child's age (months)									
Child's age				1.115	0.000	0.008	1.112	0.000	0.008
Child's age squared				0.998	0.000	0.000	0.998	0.000	0.000
Child's sex				*ref*			*ref*		
Female									
Male				1.152	0.005	0.058	1.160	0.003	0.057
Birth order									
Birth order				1.034	0.332	0.036			
Birth order squared				0.997	0.249	0.003			
Intercept									
Constant	0.948	0.480	0.071	0.133	0.000	0.044	0.120	0.000	0.020

Appendix Table 4.3: Odds ratios (OR) for covariates of logistic regression for moderate or severe stunting. Model 1 has no covariates, Model 2 includes all environmental, household, caregiver, and child covariates, Model 3 has select covariates based on significance in Model 2.

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Map credits

Figure 4.1:

- Food and Agriculture Organization, 2006, MODIS Satellite Image mosaic 2.5d enhanced (~230 m) http://www.fao.org/geonetwork/srv/en/resources.get?id=30977&fname=af_bmng-shd.zip&access=private
- Esri, Populated Places (2010) http://www.arcgis.com/home/item.html?id=587c838521864164acd245ea03315006
- Esri, HydroSHEDS Rivers Africa (2012) http://www.arcgis.com/home/item.html?id=fedf8e234b614ecaac65893f807344f5

Chapter 5. Conclusions

The goal of this dissertation was to contribute to our understanding of how climate and conflict impacts diarrheal disease and malnutrition among young children. The research in Chapters 2 and 3 examined the associations between climate and diarrheal disease across the whole study area – ten countries in West Africa during the period 2008-2013 – using geo-spatial methodologies. The study in Chapter 4 took a closer look at one particular area – Northeast Nigeria – to examine the effects of the on-going conflict there on childhood diarrhea and malnutrition with a double-difference methodology.

5.1 Major findings from Chapter 2

1. Regression analysis shows that household and climatic variables influence the odds of diarrhea in children in West Africa.

Results from a single model with odds ratios (95% confidence intervals):

- Moderate rainfall of 0.01 to 10 mm compared to no rainfall: 0.80 (0.72-0.89)
- Heavier rainfall of greater than 40 mm compared to no rainfall: 1.20 (1.08-1.33)
- Hotter temperatures (up to 34□C) compared to cooler ones (less than 25□C): 1.30 (1.11-1.52)
- Poorest quintile compared to richest: 1.51 (1.34-1.69)
- Desert climate zone compared to fully humid/monsoonal: 1.57 (1.22-2.02)
- Urban areas compared to rural: 1.82 (1.53-2.16)
- Households with 22 people or more compared to households with 2-6 people: 1.89 (1.6-2.2)
- Mothers with only a primary education compared to those with post-secondary education: 2.13 (1.73-2.61)
- Children aged 12-23 months compared to children aged 24-59 months: 2.38 (2.27-2.51)

The odds of diarrhea among children were increased and significant with increased poverty, household size, among children whose mothers had little education, and among toddlers age 12 to 23 months. The mother's

education and child's age had the highest effect. This indicates the importance of resources and knowledge to combat diarrheal disease; for example that a family knows the importance of clean water, can afford it, and ensures the youngest members of the household are prioritized for its use. In this analysis, children in urban areas are on average more at risk than their rural counterparts, which indicates that there is an urban disadvantage in this part of Africa. Odds of diarrhea were increased and significant as climate zones grew progressively drier, *ceteris paribus*, which speaks to the presence of other unobserved factors such as food security, in the harsh Sahelian climate. Diarrhea odds increased with increasing temperatures, perhaps a result of pathogen survival and replication. Children in environments where there was moderate rainfall had lower odds of diarrhea than those in both very dry areas and very wet areas, demonstrating how diarrhea pathogens can become concentrated with low rainfall, and can spread through water and sanitation systems with high rainfall.

2. Even after adjusting for household and climatic covariates, geo-spatial analysis shows there are 23 statistically significant clusters of elevated risk of diarrheal disease throughout the study area. Increased risk was greatest in certain urban areas (7.16 in Cotonou, Benin; 7.21 in Kaduna, Nigeria), but substantial throughout the study area (over 2 in 18 out of 23 clusters). Some clusters encompassed whole cities – Dakar, Senegal had a relative risk of 4.79 and Yaoundé, Cameroon had a relative risk of 2.14. Other clusters were more mixed, for example, the city of Bamako, Mali and the surrounding rangelands had a relative risk of 5.09. Other clusters were small villages (one in southern central Nigeria had a relative risk of 6.03) and still others were in areas with very sparse populations (northern Burkina Faso, relative risk 2.22; western central Cameroon, relative risk 3.69). These findings indicate that a) there are unobserved factors which influence diarrhea risk – perhaps food security or failed municipal systems and b) risk cannot be characterized by designations such as urban or rural in themselves.

3. These findings largely agree with the original hypotheses in that they underscore the importance of household and climatic factors when determining risk factor for diarrheal disease and that the risk is not uniform across or within nations. The effect of temperature was stronger than anticipated, which may be a result specific to the tropics. Additionally, there were more clusters of elevated risk in urban areas than were expected, which speaks to the question of urban advantage and disadvantage in sub-Saharan Africa.

4. The study provides further evidence of the importance of development programs such as education in reducing the risk of childhood diarrhea. It also gives insight into areas of particular risk which could be targeted for development and adaptation interventions. These interventions could be tailored to the context; for example improved municipal water and sewage systems in cities such as Dakar and Yaoundé and food security adaptation in rural areas such as southern Mali.

5.2 Major findings from Chapter 3

1. Geospatial analysis of childhood diarrheal disease and socioeconomic, environmental and climatic explanatory factors in West Africa show that a) there are spatially varying relationships among the associations (non-stationarity), b) the associations are both positive and negative depending on location, and c) the statistical significance of these associations is also dependent on place.

2. The geospatial analysis revealed complex relationships that were masked by the global model, which produces one average value for each coefficient. For example, the percent of the population with an unimproved water source was not statistically significant in the global model, but showed an increased risk of up to 11% in locations such as Freetown, Sierra Leone; Conakry, Guinea; and Lagos, Nigeria in the Geographically Weighted Poisson Regression model.

Range of relative risk in a single GWPR model:

- Population with unimproved water source (per 10% increase): 0.93 – 1.11
- Population with unimproved toilet type (per 10% increase): 0.84 – 1.10
- Mothers with no formal education (per 10% increase): 0.78 – 1.14
- Latitude (per 1-degree increase): 0.02 – 15.06
- Temperature (per 1-degree increase): 0.28 – 1.83
- Rainfall (per 10-mm increase): 0.43 – 41.30
- Altitude (per 100-m increase): 0.33 – 2.80
- Population density (per 100-pp/km2 increase): 0.65 – 1.68

3. The complexity of these relationships was not anticipated in the original hypothesis. The degree of spatial non-stationarity shows that even within a single model, factors affecting the risk of diarrheal disease are not statistically significant in many areas and very strong in others. The positive and negative associations are reasonable for environmental and climatic factors, but more difficult to interpret for socio-economic ones (e.g., decreased risk when a large proportion of the community uses drinking water that has a high probability of being contaminated).

4. This analysis is best seen as an exploration of regional dynamics affecting diarrheal disease. However, it does point to certain areas which face particular risk factors such as in certain urban centers, low-elevation areas (coastal and along rivers), remote areas such as western Mali, conflict zones (northeast Nigeria), and special populations such as the Dogon who live along the Bangiagara Escarpment. With further analysis, interventions to combat specific risk factors may be developed.

5.3 Major findings from Chapter 4

1. Results from the double-difference analysis suggest that if children exposed to the conflict in Northeast Nigeria had not been exposed, their average weight-for-height z-scores would be 0.49 standard deviations higher ($p < 0.001$) than they are. This would bring the average from -0.74 to -0.25 (from a "serious" nutritional crisis to a "poor" one).

2. Additionally, the prevalence of moderate or severe wasting would be 13 percentage points lower (mean z-statistic -4.2) than it is, bringing down the proportion from 23% (a "critical" nutritional crisis) to 10% (a "serious" nutritional crisis and close to the average for West Africa, 9%).

3. The prevalence of diarrhea would also be lower by 8 percentage points (mean z-statistic -3.3), which would bring the rates down from 20% in the conflict states to 12% (close to the Nigerian average of 10%).

4. These findings support the original hypothesis, although there were greater differences in baseline outcomes for conflict and non-conflict states than anticipated. Also, a linear downward trend was expected, at least in the baseline period, but the trends were more erratic, likely due to few time periods for comparison. As hypothesized, significant improvements were found for the counterfactual scenario (if children exposed to conflict had not been exposed) for weight-for-height, moderate/severe wasting, and diarrhea. Weight-for-age and moderate/severe underweight did not have statistically significant doubledifference estimates and height-for age and moderate/severe stunting did not meet the common trends assumption.

5. This analysis speaks to the importance of ensuring children and their mothers receive adequate health and nutritional support in the "first 1,000 days" – from conception to age two (and beyond), especially in extraordinary circumstances such as when a community is faced with armed conflict. Development projects

such as poverty reduction are important, but conflict areas will likely require additional assistance to ensure access to goods and services such as food and specialized health care.

5.4 Significance of findings

The findings of the studies in this dissertation contribute to our understanding of how climate and conflict affect child health. Previous studies have given varied results on specific climatic factors. Here, the associations in aspatial regression analyses are quite clear, while geospatial methods indicate the complexity of factors such as overall climate, rainfall, and temperature. The effects of conflict on child health are conceptually inherent and have been quantified with different methods and outcomes. The research here furthers those efforts by quantifying the impact of a particular conflict on the health and growth of young children.

The findings from this research support on-going development goals which aim to improve modifiable factors including increased coverage of improved water sources and sanitation facilities, increased educational attainment, the alleviation of poverty and food insecurity, and resolving on-going conflicts around the world. The results also support adaptation measures, which are aimed at factors that are difficult to change in themselves, such as living in areas where temperatures are increasing or rainfall is decreasing. Such measures include promoting income diversification and access to goods and services for farmers and pastoralists and improving infrastructure and public services in urban areas.

5.5 Limitations

The studies in this dissertation have several overlapping limitations. First, the studies in Chapters 2 and 3 are cross-sectional and intentionally descriptive. Thus, while they provide insight into various associations, they do not imply causality. The quasi-experimental double-difference analysis in Chapter 4 can be used to make

limited causal inferences; for example, the outcomes are different for children exposed to conflict or not, but we do not know by what mechanism or mechanisms (e.g., increased food insecurity, disrupted health services, population displacement, etc.).

Second is the issue of temporality when using survey data. The DHS surveys are an enormous undertaking and most participating countries only do them every few years (although a few, including Senegal, have committed to continuous surveys). For this reason, although they are treated as cross-sectional studies, Chapters 2 and 3 contain data which span five years. West Africa is a rapidly changing sub-region with some positive developments such as overall decreasing rates of child mortality and some negative trends such as growing inequality. Thus, while these changes are generally slow, it is difficult to obtain a true cross-sectional snapshot of several countries at once which could introduce bias into the estimates. The timing of the surveys may capture real-time events, such as the declaration of the state of emergency in Northeast Nigeria. The DHS program gives no indication that their survey methodology was hampered by these particular events – still, if teams avoided the most affected areas or were rushed in their interviews, rates of malnutrition or other diseases could be underestimated. Similarly, there were temporal constraints for the common trends analysis in Chapter 4: more timepoints may have shown clearer trends, especially for stunting. On a smaller timescale is how households are interviewed over the course of the survey. Ideally, sub-national regions would be surveyed simultaneously, which would allow for more comparable analysis with regards to rapidly changing climatic factors such as rainfall. There are also temporal issues inherent in surveys about episodic diseases such as diarrhea in that there is a 2-week recall period which could introduce bias.

Third are spatial constraints, especially for Chapters 2 and 3. The sampling points are intentionally offset and are broad estimates of the location of the population of interest. The use of Voronoi polygons as pseudocatchment areas in Chapter 2 made visualization easier, but may be misleading, especially in areas

where sampling points were far apart. Additionally, other covariates such as rainfall, temperature, altitude, urban limits and so on are at different spatial resolutions, which introduce different biases when applied to sampling points. For example, the SRTM data for altitude are very high resolution (< 100 meters), so relatively accurate while temperature rasters are lower resolution (0.5x0.5 degrees, which is approximately 55 kilometers at the equator) and therefore a coarser estimate of the true measure.

Fourth are various methodological issues such as the bias introduced when the number of observations per sampling point varies greatly, even after weighting. This could be due to missing data for key variables, but is also the result of the DHS sampling method, which focuses on women of reproductive age rather than children under five. Another issue is multicollinearity across local estimates in Geographically Weighted Regression (Chapter 3). If there are parameter redundancies, a single coefficient cannot be interpreted independently of the other coefficients at the same location, which can result in misleading findings. Another example of methodological issues is finding an appropriate comparison group in double-difference analysis (Chapter 4). For a study on conflict, the ideal comparison group would be exactly the same as the intervention group, except for conflict to exposure. In this study, the other states of the Northeast Zone were chosen as the comparison group since the population is closest in terms of climate, livelihoods, culture, and governance and also because the survey interviews were conducted within the same timeframe as the conflict areas. However, the non-conflict states were subjected to attacks from Boko Haram, although to a lesser degree. In these situations, the analysis is often conducted again with a different comparison group to validate the original results. In Nigeria, this could be the Northwest Zone, for example. Other limitations are addressed as areas for improvement in the section below.

5.6 Future research directions

There are numerous areas for future research in the fields of climate variability, conflict and child health. The types of geo-spatial analyses used in this research could be replicated, but using spatial regimes other than administrative boundaries such as country borders. For example, the Sahel region is a transition zone between the fertile south and desert north stretching from Senegal and Mauritania in the west to Eritrea in the east, about 4,000 kilometers. While covering 10 countries, the population in this region – estimated to reach 100 million people by 2020 – are related by culture and livelihoods, which are largely determined by climate.[1] One area of research could be examining child health outcomes across the Sahel and determining whether certain coping mechanisms (crop diversification, mobile health teams that follow transhumant populations) improve outcomes and could be introduced to other Sahelian communities. The Sahel must also be studied in terms of climate change, its impact on child health, and what adaptation measures are most effective. Climate models are yet uncertain as to future rainfall patterns in the Sahel, but agree that the region will be one of the fastest warming areas in the world.[2] One impact from increasing climate variability (e.g., erratic rainy seasons) that is already being seen is migration to northern cities such as Dakar, Bamako, and Ouagadougou. Given this dissertation's findings on urban health disadvantage for some cities, an area of research could be to examine how these Sahelian cities can better adapt for influxes of migrants, including adequate services such as health care and education, but also infrastructure important to child health including sanitation and water systems (which are also becoming more stressed in the warming Sahel). The impacts of climate change on child health could also be studied using projections of the Köppen-Geiger climate classification scheme, which are already available through the year 2100 (though likely will have to be updated as climate models improve).[3] An example of a study which could be conducted in one geographic zone with specific socio-economic measures is from the livelihood zones produced by the Famine Early Warning Network. For example, all along the coast of Nigeria, people fish from July to March and plant crops from March through November.[4] Thus wealth in the rural areas is largely determined by the type of fishing gear (canoes with outboard motors vs. nets and hooks) and the amount of land a household owns.[4] A

research project could examine the child health outcomes of these populations, again to determine which interventions (e.g., sustainable fishing co-operatives) may improve population health.

Conducting research on smaller spatial scales would also likely provide telling results. For example, also along the coast of Nigeria, is Lagos, by far the region's largest city. In the study in Chapter 2, Lagos was not an area of elevated risk even before controlling for household or climate variables, despite having extensive slums, including large neighborhoods on stilts within a coastal lagoon.[5] However, both altitude and percent of households with unimproved water sources did invoke increased risk in the GWR analysis (Chapter 3). A project investigating Lagos at high resolution may be able to determine with greater accuracy which risk factors are most important and at which specific locations. If contaminated water sources are a risk factor, it will be especially important to address the issue as the number of people in Lagos vulnerable to coastal flooding due to rising sea level is expected to reach more than 3 million by the year 2070.[6] This study would also contribute to the very small body of research which specifically examines low elevation coastal zones with regards to health outcomes. However, the intentional displacement of the DHS sampling points and the fact that the DHS household wealth index may not detect urban vulnerability (e.g., households with flush toilets, but living next to overflowing sewer systems), means that this analysis would likely have to be done with a different data set. Flooding is an example of an aspect of climate variability not addressed in this dissertation – extreme events. Flooding is often harmful, but is also a reliable irrigation technique which supports millions of people, for example in the Inner Niger Delta in Mali. The effects of proximity to flood zones on child health could be studied and future predictions made with assumptions about climate change, population changes, and resource management.

Given the correct data structure, research could also be conducted using different temporal regimes. SaTScan software, used in Chapter 2, is capable of conducting spatiotemporal cluster analysis, but with most survey

data, temporal clusters would just be where the interviews were being conducted. However, if survey teams were in several areas at once or for example, health facility records for a particular month were being compared, this would provide insight into the contribution of factors such as rainfall or even conflict. GWR analysis, used in Chapter 3, could also be conducted over time; for example an analysis of risk factors during the rainy season and then with the same population in the dry season.

There are other conflict zones for which there is little quantitative analysis available and where the methods used in Chapter 4 could be replicated. For double-difference analysis, a clear before-after time demarcation as well as a reasonable comparison group is needed. Therefore, the conflict in northern Mali may not be appropriate as there has been unrest in the region for decades. However, research could conceivably be done on a smaller spatial scale; for example, a comparison of violent and non-violent causes of death in the city of Timbuktu before and after the ten month occupation by Islamist militants in 2012-2013. Another question of interest brings together the two main drivers of this dissertation: does climate variability contribute to conflict and will climate change exacerbate conflict?

The data sources and methodologies used in this dissertation are continuously growing and improving. There are many more climate datasets than even a few years ago and geospatial software developers continue to add in new features. The DHS datasets are an invaluable resource; however, with growing recognition of how climate affects not only health, but other demographic phenomena such as migration, it would be beneficial if the DHS program could review how interviews are scheduled within sub-national regions in order to better capture climate variables. Likewise, questions about migration should be incorporated into as many surveys as possible, not only to address issues such as urbanization, but also displacement due to conflict. The problems of the developing world can no longer be considered completely separate from those of the developed world. For example, the nutrition transition to the “Western diet” is uneven between and within

poor countries which is leading to simultaneous undernutrition and overnutrition. Thus, DHS should consider including the assessment of nutritional edema into their surveys to avoid misclassification bias and more importantly, to identify severely malnourished children with the condition. The technique is simple and fast - simply pressing ones thumbs into a child's feet for 3 seconds and noting if the indentation remains. Another consideration for DHS is the use of mid-upper arm circumference (MUAC) instead of or in addition to weightfor-height. MUAC is easier to measure than weight-for-height (height, especially is subject to inter-operator bias), and does not require additional charts or software to calculate usable numbers (which increases the possibility of error).[7] MUAC is less trying on very sick children and can be routinely done by trained personnel in resource-poor settings as the tool (a modified tape measure) is quite inexpensive.[7]

One of the particular issues software developers could address is the use of categorical variables in Geographically Weighted Regression programs. For example, in West Africa, the climate classes do not exactly follow latitude, and more interpretable results may be obtained with these well-defined spatial regimes. Additionally, there is a fundamental difference between a household with an unimproved toilet type and the percentage of households within a "community" (the approximately 20 households within a DHS sampling point) with unimproved toilet types. In some cases, the latter may be more relevant, but the researcher would benefit from having the ability to choose between individual-level or community-level characteristics (or both). Another software improvement would be for mapping relative risk as shown in Chapter 3. Current Esri software does not allow the user to choose a particular point (for relative risk, 1) and then choose two different color schemes with gradients to indicate increasing risk in one direction and decreasing risk in the other. For this study, two layers were created for each direction away from 1 and separate gradients created in the legend. The legends were then converted to graphics and manually rescaled to approximate the range of risk overall (for example, for a range of 0.50 to 2, the decreased risk scale should be one quarter the size of the increased risk scale) and then joined at the 1 mark. While this is an improvement over previous methods,

it is still somewhat inaccurate and could doubtless be automated. The advent of geocoded data and geospatial methods has opened new areas of study within public health and other fields. Continuous improvements to both data and methods will increase our understanding of complex relationships even more.

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Risk factors and costs influencing hospitalizations due to heat-related illnesses: patterns of hospitalization

by

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Abstract

Risk factors and costs influencing hospitalizations due to heat-related illnesses: patterns of hospitalization by

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The objective of this dissertation was to identify individual and environmental risk factors, investigate outcomes and hospital resource use, including costs, and document the pattern of heat-related illness hospitalizations in the United States. The main data source for the study population was the 2001-2010 Nationwide Inpatient Sample (NIS). The study population for heat-related illnesses (HRIs) consists of patients in the NIS with at least one diagnosis of a heatrelated illness (ICD-9 codes 992.0 – 992.9) from 2001 to 2010. Outcome analysis included a study population of patients who had primary or secondary diagnoses of diabetes, cardiovascular diseases, respiratory illnesses, nephritic illnesses and acute renal failure along with a diagnosis of a heat-related illness. Outcomes for costs were calculated and adjusted using the medical consumer price index for 2013. Data on air conditioner use and total cost of electricity use from air conditioning was derived from the Residential Energy Consumption Survey. This study identified a number of previously unknown risk factors for heat morbidity HRI, including age greater than 40, males and hospitalization in rural areas and small urban clusters. Additionally, stratified analyses of outcomes further identified specific risk factors among vulnerable populations. Elevated risk of negative health outcomes and increased hospital resource use was seen in patients diagnosed with common comorbidities, in particular those of a lower socioeconomic status, minority and most age groups with diagnoses of cardiac and respiratory diseases with a HRI. Analyses of costs showed substantial costs associated with hospitalizations due to heat-related illnesses with the average mean cost approximately $52.7 million while the

total aggregate cost for the time period at just over half a billion dollars. Projected estimates for the average yearly cost of these hospitalizations in the future climate with estimates around half a billion US dollars by the late-21st century.

In conclusion, the study revealed a number of risk factors and negative health outcomes associated with hospitalizations of heat-related illnesses. These findings provide additional scientific evidence that heat-related illnesses will continue to rise and will continue to be a public health burden as climate changes increase in frequency and intensity of extreme weather events.

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Chapter 1. Introduction

1.1. Climate change and extreme weather events

Global warming and climate change have increased the frequency and severity of weatherrelated hazards. This trend has prompted governments to research ways to adapt to our changing climate in order to reduce morbidity and mortality during extreme weather events. Studies by climate change researchers[1,2] indicate that the frequency and intensity of extreme climate events has increased in recent decades, and that adaptation to these rapid changes is more challenging than gradual climate change. Moreover, extreme climate events disproportionately affect vulnerable populations who experience higher exposure (e.g., low-income populations facing extreme heat often lack access to air conditioning and are more likely than the affluent to live in flood-prone areas) or higher susceptibility (e.g., elderly individuals are more physiologically vulnerable to heat-related illness) to such events.[3] Heat waves are one such extreme weather phenomena that have increased in frequency and are likely to have dire consequences for vulnerable populations. Recent studies indicate that as global temperatures continue to rise due to the increase of greenhouse gases the frequency and intensity of extreme heat events are likely to increase.[4-7] Climate modeling also predicts that heat waves are likely to affect areas that had not previously experienced extreme heat events, increasing the geographic range and populations at risk of heat waves.[7] This increase in geographic areas prone to heat waves will in turn increase the incidence of heat-related illness and other public health impacts. Although, on average, there were only about 400 deaths were directly attributed to heat in the United States in 2002[8] an increase in ambient temperature can also exacerbate underlying chronic conditions such as cardiovascular,

respiratory, and cerebrovascular diseases as well as psychiatric conditions.[9-11] Air pollution also increases during extreme heat events and may further exacerbating underlying medical conditions, particularly respiratory diseases.[11,12] Studies have found a 5-11% increase in hospital admissions as well as increased use of ambulances, telephone helplines and dispatches by fire departments during heat waves.[13,14] Hence, the expected increase in heat-related and exacerbated illness is likely to stress health care systems and emergency responders.

Although public health interventions may focus on the prevention of heat-related illness, public health practitioners and policymakers should also direct preventive measures to the community- and environment-level effects of extreme heat events.[15,16] Heat waves can have devastating effects on livestock and crops, and can damage electrical equipment, roads, bridges and other types of infrastructure.[16] In countries like Australia and western parts of the United States heat waves are often accompanied by brush and forest fires, which further stress limited emergency responder resources.[16] Heat waves also strain energy resources as many people use their air conditioners in an effort to combat the heat. This increase in use of air conditioners may stress power plants and electrical transfer stations, and in some cases, result in blackouts and brownouts. In 2004, 30% of California's peak electricity demand was due to air conditioning use alone and has been projected to increase annually.[17] Air conditioners also emit heat, increasing ambient temperatures as well as air pollutants due to the increased demand for electricity which is mainly produced by fossil fuel-burning power plants.[18,19]

Climate change, including increasing temperatures and related changes in other aspects of global climate change is likely to initiate a number of other harmful effects on public health. Principle concerns include contamination of water and food; changes in infectious disease transmission rates; increased allergen production; changes in populations due to loss of habitat and sea level

rise; and nutritional shortages from disruptions in food production and transportation systems.[20] Rising temperature will likely increase the spread and transmission rate of some infectious diseases that proliferate at higher temperatures like cholera and salmonella. Vector-borne and rodent-borne disease rates are also likely to increase due to increased temperatures that allow for longer breeding times and the spread of the transmissible agent to higher latitudes.[21,22] In addition to the spread of vector-borne and rodent-borne disease to new areas, the distribution of plant species and pollen production is likely to undergo change triggering changes in the incidence of allergic symptoms. Increased temperatures may change the amount of time humans spend outdoors, also increasing their chance of exposure to allergens and allergic reactions.[11] Increased temperatures may indirectly affect population growth through the reduced availability of water and food sources, increasing economic disparities and migration to urban centers. Migration to urban areas may further increase heat-related illnesses as population growth puts additional stress on already weak health systems. Civil strife and wars due to lack of resources may also force populations to migrate to already congested locations. These changes, as well as the public health disparities listed above, will have the greatest impact on those who are already socially and economically disadvantaged.[21]

Climate change will exacerbate existing food insecurities in many locations. A recent study found that, in the US for every degree rise in temperature corn and soya bean yields fell by 17%.[23] Rising temperatures will take a toll on farmer's crops adding to food shortages in already food scarce locations like sub-Saharan Africa and south Asia. Increased temperatures are also likely to result in prolonged droughts and/or flooding destroying crops and interrupting the growing season at critical junctures.[22,23]

Although a rise in global temperatures will have a devastating effect in many public health arenas, the most thoroughly studied climate-health impact in developed countries are the acute

effects of extreme heat events. Despite numerous studies there are gaps in knowledge surrounding population-level public health impacts of heat events, vulnerable populations, and effective public health protection strategies. For example, heat health warning systems (HHWS) have been implemented in a number of developed cities such as London, Chicago and Madrid though the protective capacity of these systems are reduced because of limited information regarding how the system should be triggered and concerns over the most effective messaging for vulnerable populations.[24] Researchers have also indicated that poor and developing countries will suffer the worst effects due to a global rise in temperatures and ensuing heat events, though most of this data comes from predictions based on climate modeling and current socioeconomic conditions.[21]

1.2. Heat-related illness

Excessive hot weather can induce illness and even death in humans.[25] As climate change increases the frequency and intensity of extreme heat events scientists and health officials should work towards improving our understanding of the causes for heat-related illnesses (HRIs). To fully understand HRIs initiated by extreme heat events we must first settle on a definition of a heat wave and a HRI. The definition of a heat wave varies by location, as risk is strongly dependent on climate and adaptation. For example, people living in colder climates are more adapted to cold weather while those living in hotter climates are more adapted to hot weather. In addition, improved infrastructure including better housing, availability of air conditioning and access to health care improves an individual's ability to adapt to hot weather.

To arrive at a definition of a heat wave, we must first determine the threshold temperature which would be considered above normal and which may induce negative health effects. Maximum

daytime temperature, minimum nighttime temperature and mean temperature are commonly used measures of heat exposure. Factors such as wind speed, humidity and barometric pressure are also used by some researchers in addition to temperature indices. Apparent temperature (AT) or heat index is one measure often used. This calculated temperature is an adjustment of the ambient temperature based on humidity and wind speed.[26]

Apparent temperature combined with weather patterns and duration of heat delineates when and where a heat wave occurs. For example, the United States defines a heat wave as two or more days of excessively hot weather in which the thresholds of daytime high and nighttime low heat indexes are exceeded (105°F and 80°F respectively).[27] Although a majority of studies take the approach of using AT (and defining a threshold) as an indicator for heat related morbidity and mortality, Barnett, et al. (2010) point out that there is no universally accepted measure of temperature that is used across heat morbidity and mortality studies.[28] This lack of a standardized definition is a significant disadvantage in comparative analysis among studies.

Heat-related illnesses are usually termed heat stroke, heat exhaustion and heat stress. Each is a variation of symptoms from physiological strain due to exposure to heat. Heat stress is defined as perceived discomfort and physiological strain associated with exposure to a hot environment. Heat exhaustion is a mild-to-moderate illness due to water or salt depletion. Heat stroke is a severe illness characterized by a core body temperature of >40.6°C.[29]

Heat stroke and resulting multi-organ failure is due to a complex interplay between the "acute physiological alterations associated with hyperthermia, the direct cytotoxicity of heat, and the inflammatory and coagulation responses of the host".[29,30] Until 1995, there was little consensus on the criteria that defined a HRI or heat-related death. The increasing frequency of heat waves, and particularly the 1995 heat wave in Chicago, caused medical examiners to take a closer look at

the definition of a heat-related death. The criteria for diagnosing a heat-related illness remained largely unchanged based on patient symptoms. However, because of the number of people who died as a result of the 1995 Chicago heat wave, many of which were found hours or days after they died, a broader definition of a heat-related death was needed, outside of having a core body temperature of >40.6°C.

The new definition now considers deaths from heat waves that are attributed not only to an elevated core body temperature but also if exposure to high ambient heat either caused the death or significantly contributed to it by considering factors concerning the environment at the time the body was found based on the history of high ambient temperature and the exclusion of other causes of heat stroke.[31,32]

A recent meta-analysis indicated a number of prognostic factors for heat-related deaths: Living alone, unable to care for one-self, being confined to a bed and those that do not leave home were among the greatest prognostic factors for heat-related deaths.[29] A study analyzing prognostic factors from the 2003 heat wave in France found that in addition to the above listed factors, living in an institution and transportation time to a medical facility contributed significantly to whether an individual had a negative outcome after suffering from a heat-related illness.[33]

Post-mortem studies of heat-related deaths provide insight into risk factors to heat-related illness. Studies from the 1995 Chicago heat wave and the 2006 California heat wave have shown that individuals with a history of cardiovascular, cerebrovascular, respiratory, psychiatric or renal disorders and those with diabetes or secondary infections are at increased risk of heat-related illness. For example during the 1995 Chicago heat wave there were increased hospital admissions with excess inpatient admissions for cardiovascular (31%), respiratory (20%) and renal diseases (23%) and diabetes (30%).[34] In many cases a condition such as kidney disease is

exacerbated by increased ambient temperatures forcing people to seek medical care. The prevalence of many of these underlying conditions increases with age which is the strongest risk factor for a HRI. The elderly, particularly those with an underlying medical condition, have impaired thermoregulation preventing normal body mechanisms from cooling them effectively. Moreover, medications that are commonly prescribed to the elderly such as diuretics increase this risk.[34,35]

A person's environment can play a significant role in susceptibility to HRIs. The urban heat island (UHI) effect exacerbates the risk of a HRI posed by the increase of thermal stress from the environment.[36] An UHI is characterized by increased temperatures in urban areas due to heat being retained by concrete and asphalt. This heat is then released back into the environment, particularly at night, depriving the urban environment of time to cool.[37] Living on the top floor of an apartment building also increases susceptibility to HRIs, as do forms of social isolation such as not leaving the home daily and living alone.[38]

Race and socioeconomic status also affect the risk of HRI. Minorities and the economically disadvantaged have an increased risk to heat-related illness due to factors such as lack of air conditioning, lower educational attainment and language barriers which may limit their ability to understand heat wave warning messages. A recent study in four US cities found air conditioner prevalence in White households was more than double that in Black households. This same study indicated that heat associated mortality was more than twice as high among Blacks as Whites.[39] Once an individual starts suffering from heat stroke, how promptly body temperature is reduced to normal levels is a major determinant of the eventual outcome. Studies of the aftermath of the devastating 2003 heat wave in Europe found that 50-60% of patients admitted to the hospital for heat stroke died as a result. Once multi-organ failure starts it is difficult to reverse.[40] Even

patients who survive an initial episode of heat stroke often succumb in the ensuing months. In the two studies from the 2003 heat wave in Europe and one from the 1995 Chicago heat wave, patients who were admitted, diagnosed with heat stroke and then discharged from the hospital had survival rate of 20-50% at 3 months.[40,41] A decreased chance of survival was associated with the level of disability after discharge. A study from Australia also found that approximately 20% of heat stroke patients were discharged to a rehabilitation facility or nursing home because they could no longer live independently. This Australian study along with one from the 2003 heat wave in France found that the length of hospitalization generally ranged from 3 to 10 days, with occasional longer stays when heat stroke was complicated by other medical conditions.[42,43] The increased number of hospitalizations during heat waves, and the lengthy hospital stays associated with these events, raises the question of how much HRIs are costing both affected individuals and society at large. The cost of prevention may be less expensive than the high cost of hospitalization without preventative measures. However, few cost and benefit analyses for preventive systems like heat health warning systems have been implemented to explore this issue.[44] Bassil, et al. emphasize that the cost of heat illness prevention strategies such as educational material and cooling centers are relatively low compared to the high cost of hospitalization.[15]

Challenges in identifying health impact data and lack of consensus on health care cost validation methods has made it difficult to establish a well-accepted structure for quantifying the costs of human health effects to climate change. A study of cost effectiveness for heat events in Europe estimated that in the city of Rome inaction on the prevention of HRIs could cost €283 million ($388 million USD) annually by the year 2020.[45] Hospitalizations for HRI in Germany using various climate scenarios result in hospitalization costs predicted to be approximately €300 to

700 million ($400 to 930 million USD) annually by the latter part of the 21st century, six times higher than hospitalization costs today.[46,47]

Information concerning the prognostic or risk factors of HRIs and the outcomes and costs associated with heat-related illnesses and deaths has been reviewed though it is apparent additional research is still needed in these areas. Economic assessments of the costs associated with the health impacts due to heat events are limited and lacking in past research studies. Improving the standardization of calculations for cost estimates and capturing comprehensive health data will help to quantify human health effects and costs for heat events. Also, as the number of heat events increases it is important to improve predictive modeling to forecast extreme heat events. Collaboration between disciplines, including climatologists, geographers, social scientists and public health researchers is needed to describe the many variables that go into predictive modeling and to remove uncertainties and improve accuracy.

1.3. Vulnerable populations to extreme heat events

Many different definitions and conceptual frameworks for understanding vulnerability have been proposed. In 1993, Aday defined vulnerability as being "susceptible to harm or neglect, that is, acts of commission or omission on the part of others that can wound." Aday further explains that vulnerability is in part determined by the concepts of risks and exposure and there are certain key variables that play a role in predicting vulnerability and risk.[48]

The above definition of vulnerability can be applied to the topic of climate change and the hazards associated such as floods, coastal storms and heat waves. Blaikie defines vulnerability, in the context of natural hazard as "the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard".[49] Further the Intergovernmental Panel on Climate Change (IPCC) defines vulnerability

by how a system is susceptible to, or unable to cope with changes and adverse effects from climate variation and how this system is exposed to climatic hazards, its risk, and the ability to adapt to climate change.[50] This idea of adaptation to climate change was previously thought of as adapting our physical environment and infrastructure to prevent disaster, though the most recent IPCC report has noted that vulnerability is related to both social and environmental processes. The system then can be thought of as susceptibility and sensitivity towards an event and the ability to improve the (adaptive) capacity of a response to these identified vulnerabilities.[51]

Although I have highlighted a few definitions of vulnerability, there are many scholarly disciplines with different definitions and concepts of vulnerability. Social geography, economics, political science, ecology and the physical sciences all have contributed to the definition of vulnerability and also have different ideas of what it means to be vulnerable. Some definitions of vulnerability only examine causal mechanisms to identify vulnerable populations (e.g. drought) while others incorporate ideas of coping, mitigation and recovery. Another difference between definitions of vulnerability is the categorizations of exposures and risks used in these definitions. A few definitions look at a combination of exposure variables (environmental, social and geographical) while others may only incorporate economic or socioeconomic variables as metrics of risk to define vulnerability. For example, researchers are trying to identify populations vulnerable to coastal storms; a sociologist may identify poor populations as being the most vulnerable while a geographer may define vulnerable populations as only those who live along rivers or coasts. When studying the effects of climate change on vulnerable populations researchers need to reach consensus on the definition of vulnerable populations; inconsistent definitions or misunderstandings will hinder interpretation and application of research findings if these ideas are not established before a study begins.[52-54]

In addition to many definitions of vulnerability, several different conceptual frameworks guide how to assess who or what are vulnerable to extreme weather events. Some researchers adopt an approach similar to risk assessment methodology; identifying the exposure; the amount a person has been exposed to a hazard (dose); and how to mitigate the response.[55] Others have developed a framework which incorporates ideas from both risk assessment and vulnerability assessment. Vulnerability assessment conceptualizes the definition of vulnerability by developing robust and credible measures on factors that mediate vulnerability. These measures can then be used to establish a fundamental framework for assessment. A number of frameworks to describe vulnerability have been developed, each slightly different, but largely follow four fundamental dimensions: defining the system or population; defining key variables of risk and exposure (i.e. age, location, housing); defining the hazard and degree to which the system has been exposed; and establishing a temporal reference.[49,53,56,57] In addition to the above fundamental framework researchers also include aspects of mitigation and adaptation to their framework as well as defining inherent 'resiliencies' of populations to natural disasters and extreme weather events.[57,58]

Within the vulnerability assessment framework some researchers have also adopted a taxonomic approach to classifying who is vulnerable to extreme weather events. Common indicators are age, gender, occupation, education level, ethnicity, type of housing, and socio-economic status. Although there are advantages to using a quantitative metric to identify vulnerable populations, these indices are not universal and may vary from study to study. Two quantitative studies assessing vulnerability to heat mortality both included measures of race and age, but air conditioner ownership and prevalence of pre-existing medical conditions were only collected in one study.[39,59] Picking and choosing a variable based on what data is available to the researcher is sometimes unavoidable, though a standardized list of 'vulnerability measures' would help

comparative analyses between studies of heat-related morbidity and mortality and help to ascertain the strongest predictors of vulnerability.

However, some researchers suggest moving away from the quantitative approach and using qualitative methods to better understand the processes that contribute to vulnerability to climate change including underlying psychological factors and perceptions of vulnerability. Perceptions of vulnerability to anticipated heat events and derived experiences from these events are not easily measured. Each individual will have different perceptions and experiences of these events based on their own risk and level of exposure.[57,60] One approach, taken by Klinenberg in his 'social autopsy' of the 1995 Chicago heat wave was to use qualitative methods, through in-depth interviews, in discerning who and why individuals died as a result of the 1995 Chicago heat wave. Klinenberg found that both environmental and societal factors played major roles in determining who was vulnerable to this disaster. The elderly who were both poor and a racial/ethnic minority had the highest mortality because of social isolation, living alone, and not leaving home daily due to age and fear of the high crime rates in their neighborhoods.[61]

Additional research using qualitative methods, such as face-to-face interviewing as well as focus groups can help identify vulnerable sub-populations that could be missed when doing only quantitative analyses of heat morbidity and mortality. Integrated quantitative and qualitative data on social vulnerability can be a methodological advancement in understanding and assessing vulnerable populations to extreme heat events.[62]

Researchers have also used retrospective cohort studies of mortality and hospitalizations during heat waves to identify who is vulnerable to extreme heat events. Risk factors identified include being elderly, a minority, having psychiatric conditions including depression (possibly due to medications that interfere with thermoregulation), having an underlying medical condition such

as cardiovascular, respiratory or cerebrovascular disease and diabetes.[63-65] There is conflicting evidence as to whether children are more vulnerable to heat events, some researchers suggest they are while others argue they are not more vulnerable.[64,66] In an analysis of heat related mortality in California, children under 5 and infants under 1 year of age suffered higher mortality with increasing temperature. Mortality increased approximately 5% for these populations, over other populations, though failed to achieve any statistical significance.[67]

Socioeconomic factors, such as poverty, poor housing conditions, lack of higher education, and insufficient health care access are also listed as underlying causes of vulnerability.[68]

Poverty cannot cause a natural disaster though a natural disaster can exacerbate poverty, and in many cases we see that wealth is no barrier to extreme weather events. Events such as Hurricane Katrina in 2005 in the US and the 2003 European heat waves show that, even wealthy countries experience disastrous climatic events though vulnerability and risk are unevenly distributed. However, wealth does impact the process of recovery and the resilience of a population. For example, Bangladesh and The Netherlands share similar susceptibility to sea level rise but The Netherlands has greater economic resources, technology and stronger infrastructure while Bangladesh lacks these resources and may not recovery as quickly or fully as The Netherlands.[69] The IPCC and other researchers, have noted that global warming, climate change, and the increase in frequency and intensity of extreme weather events will affect those who are already vulnerable to even small climatic changes, particularly those living in hardships in developing countries.[70] According to the International Federation of Red Cross and Red Crescent Societies (IFRC) 70% of natural disasters between 2004 and 2008 occurred in developing nations in Africa, the Pacific region, Asia and the Middle East.[71] There are already great inequities between developed and developing nations, in food safety, water sanitation and inadequate housing; with

the threat of climate change and extreme weather events these inequities are likely to increase. While extreme heat events can contribute to famine and drought in areas of population vulnerability, other extreme weather events like coastal storms are a major concern in vulnerability assessment to climate change. As the world population grows these populations flock to urban areas, many of which are in coastal regions. Urbanization, in combination with the vulnerability characteristics of low socioeconomic status give little choice on where some people live. The most vulnerable populations, biophysically and socially are relegated to living in areas prone to flooding and other undesirable affects due to extreme weather events. These conditions have been seen in poor population both in Bangladesh and in New Orleans, particularly during Hurricane Katrina.[72]

A framework for understanding extreme heat vulnerability has recently been promoted using a local level bottom-up approach to vulnerability assessment. This framework incorporates ideas from scientific concepts in the climate change literature and highlights the process of identifying and understanding vulnerability of human health to heat waves and evaluating adaptive strategies.[73] Part of this framework is to understand how collective attitudes and decisions interact and build adaptive capacity to extreme heat events. Quantitative and qualitative data gathered at the local level can inform researchers on how local knowledge and traditional coping mechanism can influence the adaptation process. Building local level data using a mixed methods approach can incorporate quantitative date, such as heat mortality statistics and qualitative data, such as household surveys on preventive measures (e.g. air conditioning). Over time, a number of comparable case studies can help influence top-down (regional, nation and international) efforts that fill gaps left by local level efforts and improve bottom-up efforts.[73,74]

As one researcher put it, "ultimately, vulnerability is expressed at the individual level, however important the social and neighborhood context".[75] Public health researchers have agreed that there are gaps in knowledge to identifying vulnerable subpopulation[67] and that vulnerability assessments need to be comprehensive in identifying these populations as well as improving adaptive and mitigation efforts. As the number of extreme weather events continues to rise, more and more populations will be at risk from natural disasters. Although some populations may not be considered vulnerable now, after one extreme weather event, a population may become increasingly vulnerable each time such events occur. For example, in 1998 Hurricane Mitch devastated much of Honduras and Nicaragua causing damage equivalent to the countries' combined Gross Domestic Product, setting development efforts back many years.[73,76] Vulnerability is a multifaceted phenomenon and solutions must be multifaceted in addressing a broad range of social, cultural, demographic and economic conditions that often interact in complex ways. For example, structural mitigation includes protective engineering methods like seawalls, levees and dams while nonstructural mitigation can include regulating property development among at-risk areas and conserving features of the natural environment that provide protection. These adaptive efforts for addressing vulnerability require input from a variety of stakeholders including politicians, scientists, engineers and ultimately, the people who are vulnerable. Future research is needed and incorporating an interdisciplinary approach and approaches for identifying vulnerable populations may improve vulnerability assessment. New methods in geographical information systems (GIS) can help identify vulnerable populations and vulnerable systems in the built environment. Characteristics of each local region or neighborhood, in terms of social, economic and cultural factors, contribute to how that

community will respond to a disaster.[77] Climate change is a global problem that requires not only a global solution, but local community solutions, especially when identifying and protecting vulnerable populations.[57,72,75]

To characterize heat vulerability for this study a simple conceptual framework was used. The framework is couched in the contextual hazard of global warming and climate change which influence the first component of heat vulnerability, the exposure (for this study, heat waves and high ambient temperatures) (Figure 1.1). Exposure is directly related to the potential outcomes, those populations exposed to extreme heat events, considering the instensity and duration have potential outcomes. The outcomes are directly influenced by sensitivity of individual and environmental characteristics. The second chapter of this dissertation will focus on identifying individual and environmental risk factors for hospitalizations of heat-related illnesses. Adaptive capacities and responses also influence potential outcomes. Interventions such as air coniditioning use and heat-health warning systems may reduce the potential negative health outcomes assocaited with exposure to extreme heat. Chapter two will also examine ait conditioner use among identified at risk populations. Examining outcomes will be the focus on chapter three which will explore health outcomes as well as hospital resource use. Common comorbidities will be examined to identify how populations with these underlying medical conditions and a heat-related illness diagnosis further understand at risk populations. The fourth chapter will look specifically at the potential outcome of costs assocaited with hospitalizations and the cost effectiveness of interventions such as air conditioning and heat-health warning systems. By using the conceptial framework of vulnerability assessment this disseration will attempt to further identify specific sensitivities, potential outcomes and review responses and adaptive capacities in interactions to better understand how vulnerable populations are impacted by climate change and heat events.

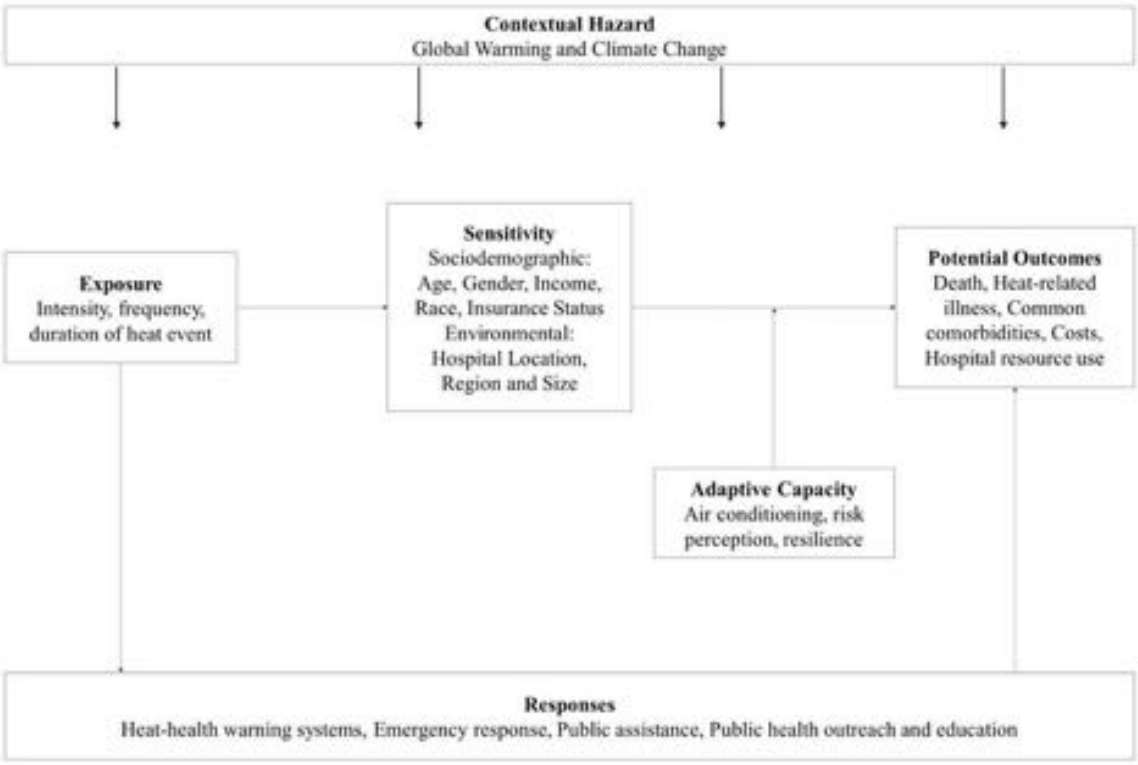


Figure 1.1. Heat –related illness vulnerability framework. Heat-related illness (outcome) is a result of exposure to extreme heat. Individual and environmental characteristics of hospitalizations (sensitivity) are examined to identify risk factors for vulnerable populations. At risk populations are also influenced by behaviors and interventions (adaptive capacities and responses), understanding responses helps to improve and reduce potential negative outcomes among populations vulnerable to heat-related illnesses.

1.4. Overview of the dissertation

1.4.1. Overall goals

To address limitations in the existing literature, this dissertation aims to identify risk factors for heat related morbidity and examine outcomes, such as hospital resource use and costs of hospitalizations due to heat-related illness in the United States from 2001-2010. Using a large administrative database that statistically represents all hospitalizations in the United States, this dissertation will give a robust description of risk factors for populations hospitalized and

diagnosed with heat-related illnesses which may differ significantly from those of heat mortality. The risk factors identified will enhance the above conceptual framework of vulnerability assessment by improving the sensitivity of vulnerable populations allowing for a better insight into those who are vulnerable during extreme heat events. Additionally, understanding aspects of protective factors such as air conditioner use will be explored and spatial analyzed among a number of vulnerable populations identified. This again will help in identifying the sensitivity of vulnerable populations while giving us information on the positive and or negative effects of adaptive capacities that are in place.

Many hospitalizations due to extreme heat events are due to direct heat illnesses, such as heat stroke a number of hospitalizations are also due to the exacerbation of underlying medical conditions. This dissertation will examine the outcomes of these common exacerbated conditions (diabetes, cardiac, respiratory and renal diseases) associated with a heat-related illness compared to those without a heat-related illness diagnosis to help explain whether HRI induced common comorbidities result in greater negative outcomes. Then, focusing on specifically cost, this dissertation will analyze current costs and estimate future costs associated with hospitalizations due to heat-related illness and explore potential cost effective options of air conditioner use and heat-health warning systems to reduce hospitalizations. By examining the potential outcomes we can improve on the conceptual framework of the vulnerability assessment by examining the interactions between sensitivity, potential outcomes and responses to these outcomes. This in turn will help to improve both the positive impacts of our response to extreme heat events and further benefit our adaptive capacities, potentially reducing negative health outcomes associated with hospitalizations of heat-related illnesses. These associations will also be beneficial to economists and policy makers to determine true and future costs of the impact of climate change on public health.

1.4.2. Specific aims

Specific aims are:

Aim 1a: To identify individual risk factors and document the pattern of heat-related illnesses through hospitalizations.

Aim 1b: To Identify sociodemographic factors in household cooling.

Hypothesis 1a: Regardless of etiology there is significant variability in HRI hospitalization patterning across sociodemographic and geographic catagories.

Hypothesis 1b: Air conditioner use and availability is limited among the elderly, low income and minority populations, those of which are most vulnerable to heat-related illnesses

Aim 2: To investigate outcomes and hospital resource use of heat-related illness hospitalizations and common comorbidities.

Hypothesis 2: Identified common comorbidities (i.e. diabetes, cardiac, respiratory and renal diseases) associated with HRIs have greater negative outcomes (e.g. death and discharge status) and use more hospital resources (e.g. length of stay and total charges) compared to the comorbidities that were not associated with a HRI diagnosis. **Aim 3: To examine the association of heat-related illness morbidity patterns and costs related to heat-related illness hospitalizations.**

Hypothesis 3: Costs associated with hospitalizations due to heat-related illness increase over study time period and will continue to increase as health impact due to climate change rise.

1.4.3. Organization of the dissertation

The subsequent part of the dissertation consists of four chapters. Chapter 2 introduces baseline demographic information on patient and hospital characteristics of the study population and used analytical approaches to identifying risk factors for hospitalizations and spatial patterns of air conditioning use (aim 1a and aim 1b). In Chapter 3, patient and hospital characteristics are analyzed for outcomes associated with heat-related illnesses and common comorbidities compared with just common comorbidities without a HRI diagnosis (aim 2). These analyses further refine characteristics of vulnerability established in Chapter 2. Chapter 4 focuses specifically on costs associated with hospitalizations due to heat-related illnesses by determining current costs and estimating future costs based on current predictive modeling of ambient temperature increases over time due to global warming (aim 3). Chapter 5 summarizes findings from Chapters 2-4 and discusses strengths and limitations of the study. The dissertation concludes with policy implications and recommendations for future research directions.

1.4.4. Significance of the dissertation

Individual and environmental risk factors for hospitalizations of heat-related illnesses identified in this dissertation add to the dearth of literature on heat morbidity. To my knowledge this is the first study to use a large administrative database of hospitalizations to identify risk factors for heat-related illnesses. As the science of matching large datasets improves, it will allow for more opportunities to explicate connections between theories and operationalization. This information can be used as a basis for understanding patterns of hospitalizations of heat-related illnesses which can be incorporated into vulnerability assessment models for extreme heat events. Additionally, by looking at both the risk factors for hospitalizations and the outcomes (discharge

status, total charges, etc.) of heat-related illness, this dissertation will yield a more complete profile of demographic and environmental characteristics for risk factors and identify additional shortcomings in current research. Lastly, the inclusion of monetary data on the actual and estimated costs of health effects due to climate change gives substantive evidence on the economic impact climate change will have on public health. Findings will benefit public health practitioners to design and implement more effective public health interventions taking into consideration risk factors, outcomes, economic costs and the already limited resources available to combat the health impacts of climate change.

1.5. Data sources and study population

The main data source for the study population was of hospital discharge records 2001-2010 from the Nationwide Inpatient Sample (NIS) which was developed as part of the Healthcare Cost and Utilization Project (HCUP) in partnership with the Agency for Healthcare Research and Quality (AHRQ). The NIS is the largest all-payer care database, with data from approximately 8 million hospitalizations per year (about 20% of all hospital discharges in the United States).[78] The NIS includes data on patient demographics and hospital characteristics, primary and secondary diagnoses coded according to the *International Classification of Diseases, Ninth Revision* (ICD9) (with up to 15 diagnoses available for the years 2001-2008 and up to 25 diagnoses for 20092010), primary and secondary procedures (ICD-9 coding up to 15 diagnoses available for the years 2001-2008 and up to 25 diagnoses for 2009-2010), type and source of admission, discharge disposition, primary payer type, total hospital charges, and length of stay. Stratification and weighting variables allow calculation of national estimates and account for the complex sampling design.[79]

For chapter 2 and chapter 4 the study population for HRI consists of patients in the 2001-2010 NIS with at least one diagnosis of a heat-related illness (ICD-9 codes 992.0 – 992.9) from 2001 to 2010. The control group for chapter 2 consisted of all other NIS hospitalizations during this time period. Since approximately 95% of all HRI hospitalizations occurred in the summer months (May-September), all hospitalizations not occurring during these months were excluded. For chapter 3, the study population consists of patients who had a primary or secondary diagnoses of diabetes (ICD-9 code 250.00), cardiovascular diseases (ICD-9 codes 390-398, 402, 404-448), respiratory illnesses (ICD-9 codes 460-519), nephritic illnesses and acute renal failure (ICD-9 codes 580-589) along with a diagnosis of a heat-related illness (ICD-9 codes 992.0992.9). Data on air conditioner use and total cost of electricity use from air conditioning was derived from the Residential Energy Consumption Survey (RECS), a national household survey conducted by the United States Energy Information Administration (EIA) starting in 1978. In 2005 and 2009 surveys were collected from approximately 4,000 and 12,000 households, respectively, which were nationally representative of the 110 million residential U.S. households.[80] The variables from the RECS used in this study include census region, state, air conditioner use, total cost of electricity for air conditioner use and householder age, poverty status and employment status. Chapter 2 focused on the spatial patterns of air conditioner use among households in the United States among 4 U.S. Census regions. Chapter 4 consisted of total costs of electricity for air conditioner use among state and state groupings as defined by the RECS.

Chapter 2. Identifying individual risk factors and documenting the pattern of heat-related illness through hospitalization and spatial patterns of household cooling

2.1. Introduction

Heat from high environmental temperatures is a natural hazard that can adversely affect human health.[1-4] Human populations have acclimatized to a variety of local climates physiologically and behaviorally, though there are limits to the extremes in temperature the human body can tolerate. An individual's ability to thermoregulate protects the body from ambient temperatures by maintaining a core body temperature around 36.0°C to 37.5°C.[5] Body temperatures outside of this range are classified as either hypothermia (body temperature below 35.0°C) or hyperthermia (body temperature above 37.5°C).[6,7] Heat-related illnesses (HRIs) - usually termed heat stress, heat exhaustion and heat stroke - include a range of signs and symptoms within the broader

definition of hyperthermia. Heat stress is a perceived discomfort and physiological strain; heat exhaustion, a mild to moderate illness; and heat stroke, a severe illness characterized by a core body temperature above 40.0°C.[7] Clinically, severe heat illness can be seen as a combination of systematic inflammatory response and cytotoxicity, which left untreated results in multiple organ failure.[5,7,8] Infants are at increased risk of heat-related morbidity and mortality as are the elderly, individuals taking medications that interfere with thermoregulation, those with underlying medical conditions such as cardiac, respiratory, renal disease or diabetes.[4,9-11]

Studies of heat mortality during specific events, such as the 1995 Chicago heat wave and the 2003 heat wave that affected much of Europe, highlight characteristics of populations that are at risk of dying during extreme heat events. During the 1995 Chicago heat wave, Semenza et al., described heat mortality among the elderly, those with known medical conditions such as cardiovascular and respiratory disease, individuals confined to bed, unable to care for themselves and with social risk factors such as not leaving the home daily, living alone, and limited social networks.[12] Similar populations were affected in and around Paris, France during the August 2003 heat wave.[13] Regression models of time series data quantifying excess mortality during heat events show that mortality rises as temperature exceeds a certain threshold.[14-16] Study methodologies using mortality end points identify risk factors for heat mortality such as being elderly, of a lower socioeconomic status, or a person of color or having an underlying medical condition (cardiovascular, cerebrovascular, respiratory, renal, neurological diseases, and diabetes).[17-19] However, the diagnosis of a specific heat-related illness is not always confirmed during heat events and diagnoses for cause of death are primarily due to the exacerbated underlying medical condition (e.g. cardiovascular disease, respiratory disease, etc.).[20-23] While relatively few studies have examined heat-related morbidity most heat morbidity studies have

used methodologies that incorporate heat-related illness diagnoses and show a stronger relationship between the risk factors and outcomes. These associations also highlight a number of protective factors for HRIs.

Some studies of heat-related morbidity have focused on emergency dispatch data and emergency department visits during individual heat events, with specific HRI diagnoses,[24-27] while others have analyzed excess hospitalizations during specific extreme heat events.[19,28,29] While there has been increased research attention on the health outcomes associated with extreme heat events, few investigations have identified risk factors that lead to HRI hospitalizations, particularly those comparable among different geographic regions mainly due to the difference in the classification of heat events across regions.[30,31] Additionally diagnoses of HRIs are often under-reported as the underlying medical conditions are often considered the primary diagnoses during a hospitalization while the HRI diagnosis may be noted as secondary or not recorded at all limiting our understanding and knowledge of heat-related illnesses.[32,33]

One of the strongest preventive measures to HRIs is ownership and use of an air conditioner during extreme heat events.[34-36] As of 2009, 87% of homes in the United States have air conditioning, although the prevalence of AC is lower (and less efficient cooling systems higher) among apartment dwellers and low income households.[37] A recent Morbidity and Mortality Weekly Report (MMWR) highlighting heat illness and deaths in New York City indicated that a majority of heat illness decedents did not have a working air conditioner, although information on cooling practices of decedents was limited.[38] Research is needed regarding a number of socioeconomic and behavioral issues that might improve access to air conditioning and reduce heat mortality and morbidity.[39,40]

In addition to individual level determinants and behaviors around cooling during extreme heat events, the environment plays a key role in exacerbating or protecting us from extreme heat events. While the urban heat island (UHI) is not a new concept, it has been used to explain higher rates of HRI in urban areas as compared to rural areas, due to the urban landscape, including lack of vegetation and impervious surfaces covering large areas.[41,42] The average ambient urban temperature is increased where vegetation has been replaced by heat-retaining materials such as asphalt and concrete. Recent studies using remote sensing and spatial analysis attempt to create heat vulnerability maps and indexes based on environmental factors.[43-45] An integrated understanding of environmental factors, individual level factors and socio-behavioral determinants is needed to accurately identify populations most vulnerable to extreme events due to climate change.

Climate change has initially affected vulnerable populations, but the increase in frequency and magnitude of climate change associated heat events ultimately disrupt and affect all populations. Using the conceptual framework discussed in chapter one, this chapter will specifically examine the sensitivity of a population and how these factors, both individual and environmental characteristics can help determine at risk populations from exposure to extreme heat events (Figure 2.1). The sociodemographic and environmental characteristics examined have a direct influence on heat-related illness hospitalizations. This research examines specific health outcomes due to climate change, heat waves, by identifying risk factors, discussing preventable measures and informing policy recommendations to prevent HRIs and adapt to extreme heat events. This study examines heat-related morbidity using a large nationally-representative administrative database to identify individual and environmental risk factors for hospitalizations due to HRI and document the pattern of household cooling. This analysis aims to identify public

health strategies for reaching populations vulnerable to heat morbidity and preventing illness and death during future heat events.

2.2. Methods

2.2.1. Data sources

The primary source of data for this study was the 2001 to 2010 Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS), which was developed by the Agency for Healthcare Research and Quality (AHRQ). The NIS is the largest all-payer care database, with data from approximately 8 million hospitalizations per year (about 20% of all hospital discharges in the United States).[46] The NIS includes data on patient demographics and hospital characteristics, primary and secondary diagnoses coded according to the *International Classification of Diseases, Ninth Revision* (ICD-9) (with up to 15 diagnoses available for the years 2001-2008 and up to 25 diagnoses for 2009-2010), primary and secondary procedures (ICD-9 coding up to 15 diagnoses available for the years 2001-2008 and up to 25 diagnoses for 2009-2010), type and source of admission, discharge disposition, primary payer type, total hospital charges, and length of stay. Stratification and weighting variables allow calculation of national estimates and account for the complex sampling design.[46,47]

This data includes information on urban vs. rural hospital location. Additional spatial data for geocoded hospital location was obtained from ESRI based on American Hospital Association (AHA) identifiers, and merged to the NIS dataset to create an updated hospital location variable. Using the 2010 Census Urban and Rural classification, geocoded hospitals were mapped and designated as being in urbanized areas of 50,000 or more people, in small urban clusters of 2,500 to 50,000 people or in rural areas which encompassed all populations outside urbanized areas

and small urban clusters.[48] This updated definition was created to determine if environmental factors like high and low urban populations and rural populations differed in HRI hospitalizations. All maps were created using ArcGIS (version 10; ESRI, Redlands, CA). Data on spatial patterns of air conditioner use was derived from the Residential Energy Consumption Survey (RECS), a national household survey conducted by the United States Energy Information Administration (EIA) every three years starting in 1978. In 2005 and 2009 surveys were collected from approximately 4,000 and 12,000 households, respectively, which were nationally representative of the 110 million residential U.S. households. The variables from the RECS used in this study include census region, state and air conditioner use.

2.2.2. Subjects and definitions

The study population for HRI consists of patients in the 2001-2010 NIS with at least one diagnosis of a heat-related illness (ICD-9 codes 992.0 – 992.9) from 2001 to 2010. The control group consisted of all other NIS hospitalizations during this time period. The HRI variable was coded as a binary indicator variable. The initial cohort consisted of 15,885 discharge records for heat-related illness (HRI) and 79,140,110 discharge records for control comparison. Since approximately 95% of all HRI hospitalizations occurred in the summer months (May-September), all hospitalizations not occurring during these months were excluded yielding a final cohort of 14,949 HRI discharge records and 37,019,792 controls.

2.2.3. Statistical analyses

The outcome variable was heat-related illness. First, a descriptive analysis of baseline characteristics was performed for HRI and control populations. Second, multivariable analysis

was performed to determine risk factors associated with heat morbidity. A log-binomial model, which directly models risk ratios (RRs), was used. Analyses were weighted for national estimates and to enhance the log-binomial approach for maximum likelihood estimates and likelihood ratios.[49] Risk factors for heat-related illnesses were explored, including patient characteristics (gender, age, race, zip code income quartile, insurance), hospital characteristics (hospital bed size, hospital location, hospital region), and comorbidities. Patient comorbidities were coded and assessed using the AHRQ algorithms based on methods developed by Elixhauser et al.[50] Third, a multilevel model was used to account for clustering of patients within hospitals. Weighted samples were not used for multilevel analysis as recommended by the HCUP hierarchical modeling report.[51] Lastly a spatial analysis was performed to visually represent HRI hospitalizations among hospital clusters. A spatial analysis was also performed with RECS air conditioner data to analyze the use of air conditioning among vulnerable populations and to compare this to findings from the analysis of risk factors for hospitalizations due to HRI. All statistical analyses were performed using SAS 9.3. This study was approved by the Institutional Review Board of Hunter College, CUNY and conforms to the HCUP data use agreement.

2.3. Results

2.3.1. Demographic and hospital characteristics

The characteristics of patients with HRI and of all hospitalized patients during the five "summer" months from 2001 to 2010 in the NIS data are shown in Tables 2.1 and 2.2. After weighting there were 73,185 patient discharges for HRI and 181,094,795 for all other discharges during this time period. Compared to all non-HRI hospitalizations, more HRI admissions were emergencies. Emergency department (ED) admission (the source) accounted for 59% for HRI hospitalizations and 34% of non-HRI hospitalizations, while emergency admission (as type of admission)

accounted for 73% for HRI and 41% of non-HRI hospitalizations The mean age was also higher for HRI than non-HRI hospitalizations, 55 years compared to 48 years. The number of HRI hospitalizations increased faster than non-HRI hospitalizations, albeit with large year to year variation (Figure 2.2).

2.3.2. Multivariable analysis of risk factors for heat-related illness hospitalization

Multivariable analyses identifying risk factors for patients with an HRI diagnosis and any other hospitalization are shown in Table 2.3. The multivariable model included race, age, gender, zip code income quartile, insurance, common comorbidities (congestive heart failure, chronic pulmonary disease, diabetes, hypertension, neurological disorders, renal failure and psychoses), and hospital characteristics including region, bed size, and hospital location (urbanize area, small urban cluster or rural). Blacks, 1.21 (95% CI: 1.19-1.23), males 3.54 (95% CI: 3.49-3.58) and patients above the age of 40 (ages 40-64) 1.34 (95% CI: 1.32-1.37), (ages 65-74) 1.28 (95% CI: 1.25-1.30), (ages 75+) 1.52 (95% CI: 1.47-1.55) had higher risk of HRI hospitalizations. Patients who lived in zip codes with the lowest median income quartile were more likely to be hospitalized for a HRI, 1.19 (95% CI: 1.17-1.21) as were those in the second median income quartile 1.08 (95% CI: 1.07-1.10). Lack of health insurance was a particularly strong predictor of being hospitalized due to HRI, 2.33 (95% CI: 2.29-2.37).

Patients with neurological disorders and psychoses were more likely to be hospitalized with HRI, with a relative risk of 1.79 (95% CI: 1.75-1.82) and 1.83 (95% CI: 1.79-1.87) respectively. Other comorbidities such as diabetes, renal failure and respiratory diseases did not predict HRI relative to non-HRI hospitalizations with risk ratios of 0.80 (95% CI: 0.78-0.82) for congestive heart failure, 0.72 (95% CI: 0.71-0.82) for chronic pulmonary diseases, 0.90 (95% CI: 0.89-0.92) for diabetes, 1.00 (95% CI: 0.99-1.01) for hypertension and 0.61 (95% CI: 0.60-0.63) for renal

failure. Examination of hospital characteristics indicate that patients in the Western U.S. region had higher risk of HRI hospitalization, 1.23 (95% CI: 1.20-1.25) as did small, 1.39 (95% CI: 1.37-1.42) and medium sized hospitals, 1.25 (95% CI: 1.23-1.27) and located in rural areas, 1.79 (95% CI: 1.74-1.83) or small urban clusters, 2.09 (95% CI: 2.06-2.12).

2.3.3. Multilevel analysis of risk factors for heat-related illness hospitalization

The multilevel analysis (Table 2.4.), found risk ratios similar to the single-level multivariable analysis. Blacks, (RR 1.17, 95% CI: 1.08-1.27), males (RR 3.55, 95% CI: 3.35-3.77) and patients above the age of 40 (ages 40-64) (RR 1.29, 95% CI: 1.19-1.40), (ages 65-74) (RR 1.15, 95% CI: 1.04-1.27), (ages 75+) (RR 1.40, 95% CI: 1.28-1.53) were at significantly higher risk of HRI hospitalizations after accounting for clustering within hospitals. Being in the lowest zip code income quartile was significantly predicted of HRI at 1.13 (95% CI: 1.03-1.25) as did being uninsured (RR 2.51, 95% CI: 2.31-2.72) in the multilevel analysis. Hospital level characteristics for the multilevel analysis also had similar results with small hospital size having a relative risk of 1.35 (95% CI: 1.19-1.53) and medium hospital size a relative risk of 1.17(95% CI: 1.05-1.30). Both the South and West were associated with an elevated risk of 1.13 (95% CI: 0.96-1.32) and 1.12 (95% CI: 0.94-1.32) respectively for HRI hospitalization. Risk of HRI hospitalization in rural areas and small urban clusters also remained higher than in urban areas.

2.3.4. Spatial analysis of heat-related illness hospitalization and household cooling

The spatial analysis for incidence of HRI hospitalizations from 2001 to 2010 by hospital location is shown in Figure 2.3. Darker shades on the map show a higher incidence of HRI hospitalizations per square mile based on hospital address, with lighter shades indicating lower

rates of HRI hospitalization. Figure 2.4. shows air conditioner use among households whose income was 100% below the poverty line for 2005 and 2009. While overall air conditioner use for all households increased from 82% in 2005 to 87% in 2009, households 100% to 150% below the poverty line had 3% to 6% decrease in owning an air conditioner from 2005 to 2009 compared with households above the poverty line. Air conditioner use among householders unemployed, retired or employed part-time (not shown in Figure 2.4.) showed a 25% overall decrease in owning an air conditioner from 2005 to 2009, compared to householders employed full-time (based only on survey results). Additionally, air conditioner use increased among householders of most age groups from 2005 to 2009, but decreased by 13% among householders 75 and older.

2.4. Discussion

Most of the individual risk factors for heat related morbidity that were identified were similar to those previous heat-related morbidity and mortality studies.[32,52,53] For instance individuals identified as African American, the elderly, and those living in zip codes at the lowest income quartile were at a higher risk for hospitalizations due to heat-related illnesses. However, the nationally representative data yielded some surprising findings as well. Males were over 3 times more likely than females to suffer HRI hospitalization, though much of the prior research has found that females were more likely to suffer from heat-related mortality and morbidity. Results also showed that all age groups over the referent group were at an increased risk of heat-related illness as compared to 18-39 year olds. Prior studies have frequently highlighted infants and elderly as being most vulnerable, especially to heat mortality, but I found that all adults 40 years old and over were at somewhat elevated risk for HRI hospitalizations.

This increased risk of hospitalization among middle-aged adults, not just the elderly may signify a lack of risk perception among the population in regards to heat-related illness. Studies have shown that adults and many elderly populations do not perceive themselves as at risk for a HRI. Many of the signs and symptoms of heat stress or heat exhaustion may go unnoticed or be attributed only to a lack of proper hydration. These early signs can quickly advance to a more serious illness without proper medical attention or cooling.

Heat is the number one cause of death from natural disasters in the United States, and is often overlooked due to the limited visibility of heat as a hazard.[54] Tornados, hurricanes, floods and blizzards are more tangible and dramatic than heat. Future intervention strategies and policy should increase awareness of heat as a significant health risk. Public health outreach and education can enhance the response to extreme weather events, such as heat waves, thereby improving potential outcomes both by improving the understanding of heat waves and knowledge concerning the risk perception and behaviors of vulnerable populations. Environmental factors that increase the risk of heat morbidity (e.g. built environment, geography) should also be identified and where possible ameliorated. Important discussions and decisions will need to center around urban design and land use as potential factors that influence our adaptive capacity and response to extreme heat events. The urban heat-island effect is one such factor influencing the risk of heat morbidity, though other structural changes such as green roofs and increase green space will also have an effect on heat morbidity and mortality. Much research has been done on the urban heat island effect and its implications on heat-related illness; though this study indicates that heat morbidity is not restricted to urban environments. Risk of hospitalization due to HRI was actually higher in small urban clusters (populations 2,500 to 50,000) and rural areas as compared to urban areas (populations 50,000+). Additional research

into heat morbidity is needed to fully understand why risk of hospitalization due to HRI is higher in small urban clusters and rural areas, more so than urban areas, despite the fact that urban areas have higher temperatures than surrounding areas, and hold that heat for longer periods of time. Hospital travel distance, absent heat-health warning systems and lower health literacy outside of urban areas may explain these differences.

Accounting for the hierarchical nature of the data improved the robustness of the analysis allowing consideration of the interacting effects of patient and hospital characteristics. Future analyses might include additional hospital-level and environmental-level variables to determine how factors such as patient or hospital location influence HRI risk. Surprisingly, I found that common serious comorbidities, aside from neurological disorders and psychoses, were not a significant risk factor for being hospitalized for a heat-related illness compared to all other hospitalizations. This is contrary to previous research indicating that these common comorbidities are exacerbated during extreme heat events. This should be interpreted cautiously as it may indicate only that other hospitalizations (i.e. our comparator) are very frequent for persons with "chronic" medical conditions. Additionally artifacts may have been introduced if the severity of the underlying condition led providers to code these conditions and underdiagnose or under-code HRI. Such underreporting can lead to gaps to further understanding of risk factors for heat-related illnesses, especially in vulnerable subpopulations. Current policies regarding diagnostic procedures during heat events should be examined to increase awareness among emergency personal and physicians to improve diagnoses of heat-related illnesses. Our results also indicate that individuals from poorer neighborhoods and especially persons without insurance are at an increased risk of hospitalizations due to heat-related illnesses. As pervasive as air conditioning use has become in the United States, many among these vulnerable populations still lack access to this protective factor. Our spatial and descriptive analysis of air conditioning

data found that poor and elderly individuals as well as those who are unemployed or underemployed have lower rates of air conditioning. These same populations are at the highest risk of being hospitalized for heat-related illnesses. In some communities air conditioning is still thought of as a luxury, but the increase in extreme heat events may make air conditioning a necessity. Steps are needed to improve the availability and affordability of air conditioning and to improve access to cooling centers. Policy surrounding energy consumption during summer months and during heat events will become an important topic as the demand for energy increases and further stresses energy distribution systems around the United States. Although this study is the first to assess nationally representative data on HRI, there are limitations. Administrative data is not as accurate as clinical data and HRI is almost certainly under-coded. Because the NIS does not capture information regarding hospital readmission, an individual can be counted multiple times if hospitalized for an HRI during different time periods. Because I was unable to account for clustered patient data, this may cause narrower confidence intervals, though given the large data set and rarity of heat-related illness diagnoses I believe it would not make much difference in the overall analysis. Additionally, the RECS data does not link specifically with NIS records due to different levels of measurement (individual versus household) thus comparisons can only be made at an ecological level. Additionally, reporting for some hospital level variables varies from state to state.

In summary, risk factors for heat morbidity differ from those of heat mortality. Using the NIS database, I identified a number of previously unknown risk factors for heat morbidity HRI, including age greater than 40, males and hospitalization in rural areas and small urban clusters. Epidemiological and spatial analytic techniques can help identify targets for policy interventions and future research.

Table 2.1: Demographic characteristics of heat-related illness patients, United States 2001-2010 (Summer)

	HRI (Not weighted), N	HRI (Weighted), %	All Hospitalization (Weighted), %
Total	14,949	73,185 (100%)	181,094,795 (100%)
Age, Mean (±SD)	55 (21.62)	--	48 (27.9)
Gender			
Male	10,998	72.99%	41.33%
Female	3,937	26.91%	58.66%
Missing	14	0.1%	0.01%
Age Categories			
0-17	669	4.45%	16.56%
18-39	3,088	20.54%	21.60%
40-64	5,709	38.17%	27.56%
65-74	1,995	13.41%	13.02%
75+	3,488	23.43%	21.26%
Race/Ethnicity			
White	8,213	54.93%	52.30%
Black	2,089	13.92%	11.20%
Hispanic	1,406	9.35%	10.40%
Other	566	3.77%	4.81%
Missing	2,675	18.02%	21.29%
Median Income Quartile*			
0-25th percentile	4,458	29.92%	22.86%
26th to 50th percentile$^{\#}$	3,210	21.44%	20.87%
51st to 75th percentile	2,345	15.59%	18.68%
76th to 100th percentile	1,716	11.42%	16.13%
Missing	3,200	21.63%	21.45%
Payer – Primary			
Medicare	5,897	39.6%	36.99%
Medicaid	1,365	9.14%	20.83%
Private/HMO	4,161	27.79%	34.83%
Self/Other	3,476	23.14%	9.01%
Missing	50	0.33%	0.16%
Insurance Status			

Insured	11,423	76.52%	90.82%
Uninsured	2,261	15.05%	5.81%
Missing	1,265	8.43%	3.36%
Admin Source			
ED	8,879	58.89%	33.95%
Other Hosp/Facility	280	1.86%	3.51%
Court/Law	7	0.05%	0.09%
Routine/Other	1,719	11.51%	38.89%
Missing	4,064	27.7%	23.56%
Admin Type			
Emergency Department	10,870	72.76%	40.94%
Urgent	2,088	14.13%	17.28%
Elective	784	5.23%	22.18%
Trauma/Other	22	0.15%	9.65%
Missing	1,185	7.74%	9.99%

* based on zip code of patient

Median zip-code income

Table 2.2: Hospital characteristics of heat-related illness patients, United States 2001-2010 (Summer)

	HRI (Not weighted), N	**HRI (Weighted), %**	**All Hospitalizations (Weighted), %**
Total	14949	72811 (100%)	180042390 (100%)
Hospital Region			
Northeast	1733	11.61%	17.13%
Mid-West	2788	18.75%	19.98%
South	8120	54.43%	45.62%
West	2308	15.22%	17.27%
Hospital Bed size			
Small	2553	17.15%	11.88%
Medium	3980	26.59%	24.45%
Large	8344	55.77%	63.34%
Missing	72	0.48%	0.32%
Hospital Location			
Rural	574	3.81%	2.21%
Small Urban Cluster	1607	10.76%	6.37%

Urbanized Area	7255	48.72%	64.67%
Missing	5513	37.01%	26.75%

Table 2.3. Multivariable model of risk factors of hospitalization for heat-related illnesses, United States 2001-2010 (Summer)

Variables	**Unadjusted**	**Adjusted#**	
	RR (95%CI)†	RR (95%CI)	*p*-Value
Race			
White	1 *ref.*	1 *ref.*	
Black	1.18 (1.17, 1.20)	1.21 (1.19, 1.23)	<0.001
Hispanic	0.86 (0.84, 0.87)	0.88 (0.86, 0.90)	<0.001
Other	0.75 (0.73, 0.76)	0.88 (0.85, 0.90)	<0.001
Gender			
Female	1 *ref.*	1 *ref.*	
Male	3.13 (3.08, 3.18)	3.54 (3.49, 3.58)	<0.001
Age Category			
0-17	0.28 (0.27, 0.29)	0.26 (0.25, 0.27)	<0.001
18-39	1 *ref.*	1 *ref.*	
40-64	1.45 (1.42, 1.47)	1.34 (1.32, 1.37)	<0.001
65-74	1.08 (1.06, 1.09)	1.28 (1.25, 1.30)	<0.001
75+	1.15 (1.14, 1.17)	1.52 (1.49, 1.55)	<0.001
Median Income Quartile			
0-25th percentile	1.85 (1.83, 1.87)	1.19 (1.17, 1.21)	<0.001
26th to 50th percentile**	1.46 (1.44, 1.47)	1.08 (1.07, 1.10)	<0.001
51st to 75th percentile	1.18 (1.17, 1.20)	0.97 (0.95, 0.98)	<0.001
76th to 100th percentile	1 *ref.*	1 *ref.*	
Payer – Primary			
Medicare	1.33 (1.29, 1.39)		
Medicaid	0.60 (0.57, 0.63)		
Private/HMO	1 *ref.*		
Self/Other	3.17 (3.13, 3.21)		
Insurance Status			
Insured	1 *ref.*		

Uninsured	3.09 (3.05, 3.11)	2.33 (2.29, 2.37)	<0.001
Comorbidities			
Congestive Heart Failure	0.80 (0.78, 0.81)	0.80 (0.78, 0.82)	<0.001
Chronic Pulmonary Disease	0.79 (0.78, 0.80)	0.72 (0.71, 0.82)	<0.001
Diabetes (no complications)	1.08 (1.06, 1.09)	0.90 (0.89, 0.92)	<0.001
Diabetes (complications)	0.75 (0.73, 0.78)		
Hypertension	1.30 (1.29, 1.31)	1.00 (0.99, 1.01)	0.8093
Fluid and Electrolyte Disorders*	7.76 (7.70, 7.81)		
Other Neurologic Disorders	1.98 (1.96, 2.00)	1.79 (1.75, 1.82)	<0.001
Obesity	0.79 (0.78, 0.80)		
Peripheral Vascular Disorders	0.66 (0.64, 0.68)		
Pulmonary Circulation Disorders	0.60 (0.57, 0.63)		
Renal Failure	0.77 (0.75, 0.78)	0.61 (0.60, 0.63)	<0.001
Psychoses	1.99 (1.96, 2.02)	1.83 (1.79, 1.87)	<0.001
Hospital Region			
Northeast	0.71 (0.70, 0.72)	0.72 (0.70, 0.73)	<0.001
Mid-West	1 *ref.*	1 *ref.*	
South	1.27 (1.26, 1.29)	0.94 (0.92, 0.95)	<0.001
West	0.94 (0.93, 0.95)	1.23 (1.20, 1.25)	<0.001
Hospital Bed size			
Small	1.68 (1.66, 1.69)	1.39 (1.37, 1.42)	<0.001
Medium	1.24 (1.23, 1.25)	1.25 (1.23, 1.27)	<0.001
Large	1 *ref.*	1 *ref.*	
Hospital Location			
Rural	2.32 (2.28, 2.36)	1.79 (1.74, 1.83)	<0.001
Small Urban Cluster	2.27 (2.24, 2.29)	2.09 (2.06, 2.12)	<0.001
Urbanized Area	1 *ref.*		

† P-values for unadjusted models were <0.001

*We interpret this as part of the HRI rather than comorbidity per se.

**Median zip-code income

#Adjusted for race, gender, age, median income zip code quartile, insurance status, comorbidities, hospital-bed size, -region, and -location.

Table 2.4. Multilevel multivariable model of risk factors of hospitalization for heat-related illnesses, United States 2001-2010 (Summer)

Variables			
	RR*	(95%CI)	*p* Value
Race			
White	1 *ref.*		
Black	1.17	1.08 – 1.27	0.002
Hispanic	0.93	0.84 – 1.03	0.148
Other	0.91	0.79 – 1.05	0.186
Gender			
Female	1 *ref.*		
Male	3.55	3.35 – 3.77	<0.001
Age Category			
18-39 (Ref)	1 *ref.*		
40-64	1.29	1.19 – 1.40	<0.001
65-74	1.15	1.04 – 1.27	0.007
75+	1.40	1.29 – 1.53	<0.001

0-17 0.2

Median Income Quartile				**0-25th percentile**	1.
26th to 50th percentile (median)	1.05	0.96 – 1.15	0.258		
51st to 75th percentile	0.97	0.89 – 1.06	0.463		
76th to 100th percentile	1 *ref.*				
Insurance Status					
Insured	1 *ref.*				
Uninsured	2.51	2.31 – 2.72	<0.001		
Hospital Region				**Northeast**	0.
Mid-West	1 *ref.*				
South	1.13	0.96 – 1.32	0.160		
				West	1.
Hospital Bed size				**Small**	1.
Medium	1.17	1.05 – 1.30	0.004		
Large	1 *ref.*	0.77 – 0.95			
				Rural	
Hospital Location					
1.93 – 2.37	1.57	<0.001		**Small Urban Cluster**	2.00
1.75 – 2.29	<0.001				
Urbanized Area	1 *ref.*				

*Adjusted for race, gender, age, median income zip code quartile, insurance, hospital-bed size, -region, and -location.

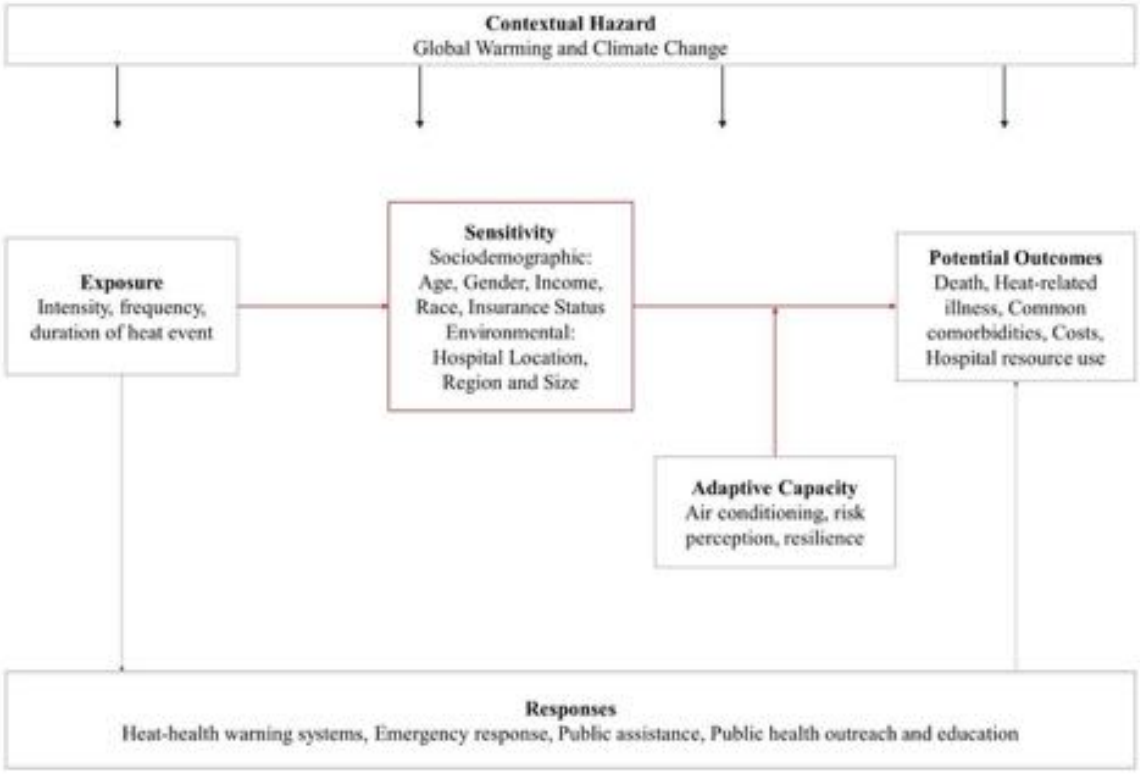


Figure 2.1. Risk factors associated with hospitalizations of heat-related illnesses. Identifying risk factors for hospitalizations of heat-related illness improves understanding of populations vulnerable to heat morbidity. Air conditioning use, a preventative measure, among vulnerable populations is examined as a potential adaptive capacity for influencing potential negative outcomes.

Figure 2.2. Heat-related illness versus all hospitalizations, United States 2001-2010 (Summer)

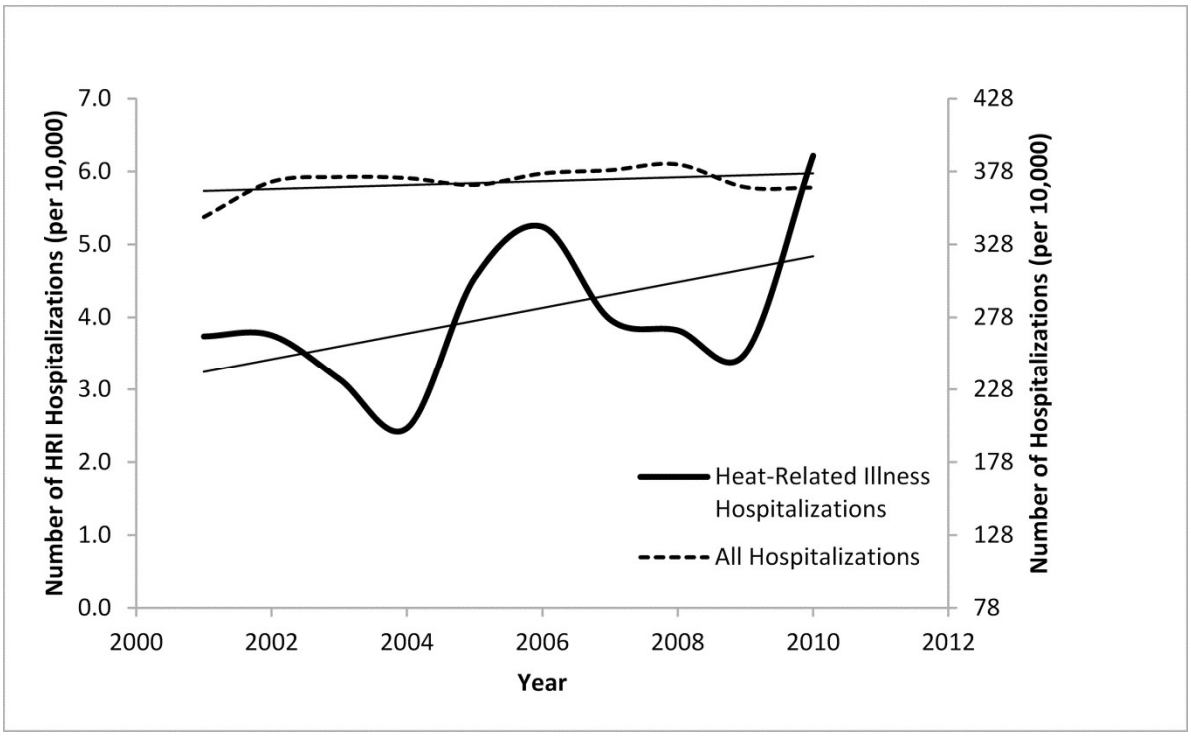


Figure 2.3. Hospitalization of heat-related illness (HRI), United States 2001-2010 (Summer)*

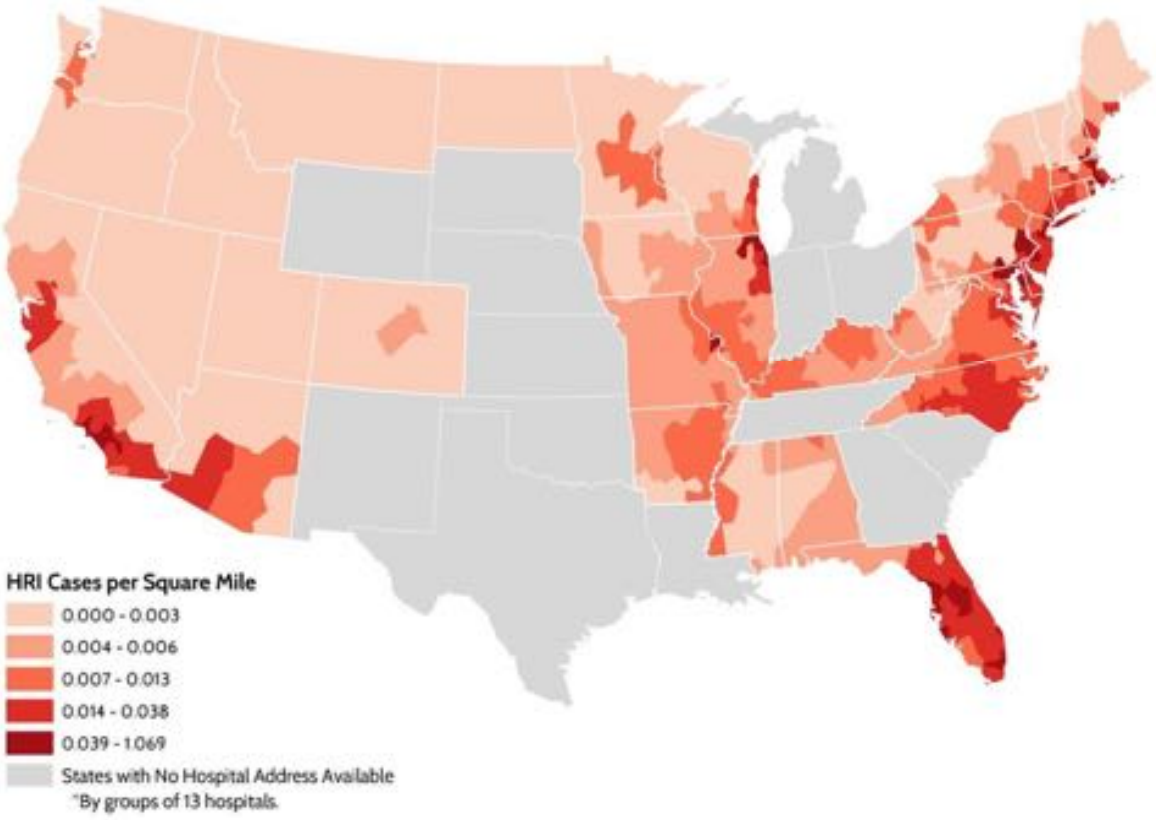
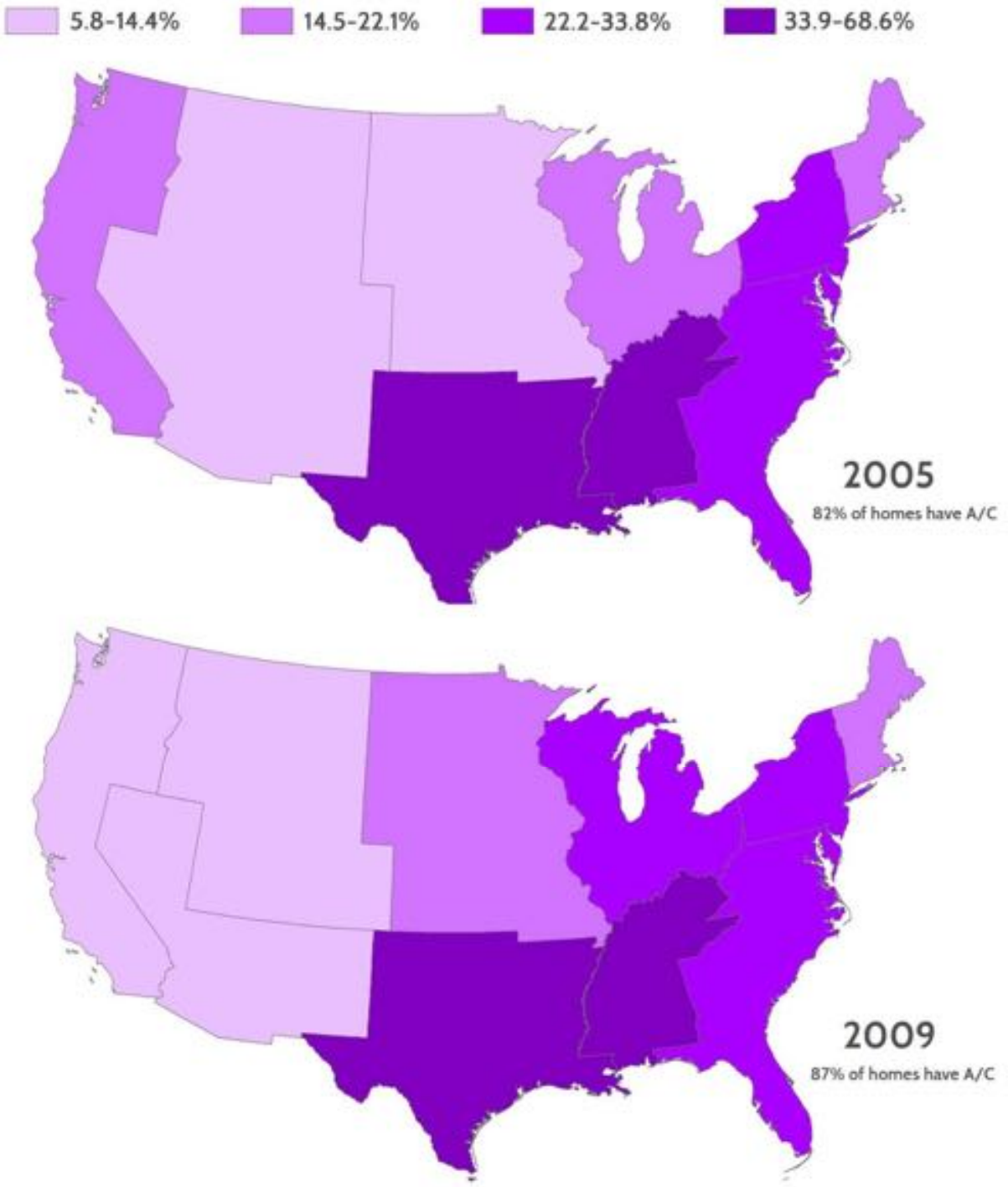


Figure 2.4. Percentage of Households with Incomes At or Below 100% of the Poverty Line without Air Conditioning, by Census Region


5.8-14.4%
14.5-22.1%
22.2-33.8%
33.9-68.6%
2005
82% of homes have A/C
2009
87% of homes have A/C

Chapter 3. Investigation of outcomes and hospital resource use of heat-related illness hospitalizations

3.1. Introduction

According to the latest Intergovernmental Panel on Climate Change (IPCC) global mean temperature is projected to increase between 1.5 and 2.3°C by mid-century and over 4°C by the end of the century.[1] High ambient temperature and extreme heat events worsen human health and are associated with excess mortality and morbidity through a range of heat-related illnesses (HRI) and exacerbations of underlying medical conditions.[2,3] The

The effect of high temperature on morbidity is a significant public health issue and is associated with a large number of hospitalizations each year.[4,5] Although hospitalizations from direct heatrelated illnesses such as heat exhaustion and heat stroke are notable, there are significant hospitalizations due to exacerbated underlying medical conditions such as cardiovascular diseases, respiratory diseases and renal diseases.[6-9] In addition, urban residents may be at higher risk for heat morbidity due to the "urban heat island effect" resulting from higher absorption of heat among dark paved surfaces and buildings and the potential for higher concentrations of air pollutants.[10-12]

The previous chapter spoke at length concerning risk factors for heat-related illness hospitalizations, though the current chapter will now examine what are the potential outcomes related to hospitalizations due to heat-related illnesses. Additionally this study will explore some of the common comorbidities that are exacerbated. While heat-related illness hospitalizations spike during extreme heat events, excess hospitalizations for underlying medical conditions, as mentioned above, increase as well. Researchers in Taiwan showed that hospital admissions for

kidney disease increased by 27% among all age-groups for ambient temperatures at or above 30°C.[13] Green et al. estimated relative risks of hospitalizations in California increased for acute renal disease (7.4%) and diabetes (3.1%) per 10°F increase above mean daily ambient temperature.[14] In Melbourne Australia acute myocardial infarction admissions to hospitals increased by 10% for one-day daily average temperatures of 30°C.[15] A recent study in the United States showed that heat-related hospitalizations for respiratory diseases in the Medicare population increased by 4.3% per 10°F increase in mean daily temperature.[7] Similarly a study in New York City showed that when temperatures exceeded 28.9°C hospital admissions for respiratory diseases increased by up to 2.7% per °C above the threshold temperature(28.9°C).[8] Additionally, current research into how heat events affect individuals with Type 2 Diabetes indicate that they are more susceptible to hospitalization during these events due to impaired thermoregulation due to the illness and prescribed medications.[16]

Heat-related illnesses are a significant cause for hospitalizations during heat events though underlying medical conditions may mask the initial heat-induced reason for the hospitalization. Hospitalizations from direct heat illness have deleterious consequences as seen during the 2003 heat wave in France with patients, especially elderly individuals, having reduced survival rates even 1 or 2 years after the initial hospitalization.[17] Patients with underlying medical conditions that are exacerbated by heat may increase the likelihood of greater negative outcomes including permanent disability and death. By using the conceptual framework for vulnerability assessment this chapter will explore potential outcomes and assess whether individuals diagnosed with a heat-related illness and common comorbidity, including diabetes, cardiovascular disease, respiratory disease and renal disease have greater negative outcomes than individuals hospitalized with only the common comorbidity thus improving knowledge concerning heatrelated morbidity and providing opportunities for intervention to prevent heat-related illness. Information on the

potential outcomes, specifically in identifying patients and populations with underlying medical conditions that are sensitive to extreme heat, will improve our ability to assess and intervene for at risk populations vulnerable to hospitalization due to heat-related illnesses (Figure 3.1).

3.2. Methods

3.2.1. Data Sources

The primary source of data for this analysis was the 2001 to 2010 Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS), which was developed by the Agency for Healthcare Research and Quality (AHRQ). The NIS is the largest all-payer care database, with data from approximately 8 million hospitalizations per year, or about 20% of all hospital discharges in the United States.[18] The NIS contains data on patient and hospital demographic characteristics, primary and secondary diagnoses (*International Classification of Diseases, Ninth Revision* [ICD-9-CM] coding up to 25), primary and secondary procedures (ICD-9-CM coding up to 25), type and source of admission, discharge disposition, primary payer type, total hospital charges, and length of stay. Stratification and weighting variables allow calculation of national estimates, accounting for the complex sampling design and the expanded sampling framework over time.

3.2.2. Subjects and Definitions

The study population consists of patients who had a primary or secondary diagnoses of diabetes (ICD-9 code 250.00), cardiovascular diseases (ICD-9 codes 390-398, 402, 404-448), respiratory illnesses (ICD-9 codes 460-519), nephritic illnesses and acute renal failure (ICD-9 codes 580589) along with a diagnosis of a heat-related illness (ICD-9 codes 992.0-992.9). The major disease groupings chosen were consistent with previous heat wave hospitalization studies, notably

Semenza, et al. 1999 and Knowlton, et al. 2009.[4,19] Since approximately 95% of all HRI hospitalizations occurred in the summer months (May-September), all hospitalizations not occurring during these months were excluded. Each disease group (diabetes, cardiac, respiratory and renal diseases) hospitalization was compared to the disease group with a diagnosed heatrelated illness.

3.2.3. Statistical Analysis

Outcome and hospital resource use dependent variables analyzed included length of stay, number of procedures, total charges, discharge status and death. Discharge status was categorized as a binary variable for either a routine or non-routine hospital discharge. Analyses for discharge status calculated the risk of having a non-routine discharge, which included transfer to a rehabilitation facility or specialty hospital, discharged with home health care, discharged against medical advice or discharged to court/law enforcement. The first analyses were descriptive statistics of outcomes for heat-related illnesses, disease grouping without a HRI diagnosis, and disease groupings with a HRI diagnosis. Secondly univariate and adjusted multivariable analyses were performed for each dependent variable. Analyses compared disease grouping outcomes versus the outcomes of disease groupings with a heat-related illness. Continuous outcomes, including length of stay, number of procedures and total charges, were analyzed with linear regression models. Binary outcomes, death and discharge status, were analyzed with a logbinomial model, which directly models risk ratios (RRs). Multivariable models included independent variables of sociodemographic characteristics (gender, age, race, zip-code income quartile and insurance status) and hospital characteristics such as geographic region (Northeast, Mid-West, South, West) and hospital location (rural, small urban cluster, and urban area). The final analyses consisted of linear and log-binomial regressions for stratified variables including

gender, age category, race, zip-code income quartile, insurance status, hospital location and geographic region. Comparators for analyses were all other hospitalizations without a HRI diagnosis and all other hospitalizations for comorbidities without a co-diagnosis of a HRI and the common comorbidity (e.g. diabetes). For example, males hospitalized with diabetes and a HRI were compared to males who were only hospitalized for diabetes and similarly for each of the stratified analysis.

All statistical analyses were performed using SAS 9.3. This study was approved by the institutional Review Board of Hunter College and conforms to the HCUP data use agreement.

3.3. Results

3.3.1. Discharge Characteristics

Sociodemographic characteristics and hospital characteristics for heat-related illness hospitalizations and disease grouping hospitalizations with and without a HRI diagnoses are found in the Appendix. Compared to hospitalizations of disease groupings (diabetes, cardiac, renal and respiratory diseases) alone, characteristics of hospitalizations of disease groupings with an HRI diagnoses were more similar to those of heat-related illness hospitalizations alone. One difference being that males were more likely to be hospitalized with a HRI compared to all other hospitalizations. There were a large number of cases for each disease grouping without a HRI diagnoses compared to the diseases groupings with a HRI diagnosis. Diabetes with a heat-related illness diagnoses only consisted of 384 cases which limited some analyses. For cardiac diseases with an HRI diagnoses there were 1819 cases. There were also some differences particularly among the youngest age category for cardiac diseases, which include fewer cases than those patients with just a heat-related illnesses diagnosis, 0.78% vs. 4.45% respectively. Respiratory

diseases with an HRI diagnosis consisted of 1430 cases and renal diseases with an HRI diagnosis included 2485 cases.

3.3.2. Univariate and multivariable model outcomes: Heat-related illness and common comorbidities

Comparative analysis for unadjusted and adjusted outcomes can be seen in tables 3.1.1., 3.1.2., 3.1.3., 3.1.4. and 3.1.5. for HRIs and disease groups, diabetes, cardiac, renal and respiratory diseases, respectively. The dependent variable for each outcome was modeled for having either a HRI or a disease grouping and a HRI diagnosis compared to not having the diagnosis among hospitalized populations. Multivariable models included independent variables such as age, gender, race, zip code income quartile of patient, insurance status, hospital location and geographic region. Outcomes of heat-related illnesses and all other hospitalizations during the time period showed no increase in length of stay, number of procedures, or total charges. Additionally there was no elevated risk of death or non-routine discharge among heat-related illness hospitalizations compared to all non-heat-related illness hospitalizations. Similar results were seen in the disease groupings, diabetes, cardiac and renal diseases with HRI diagnoses, no increase in length of stay, number of procedures or total charges and no elevated risk of death or non-routine discharges compared to diseases groupings, diabetes, cardiac and renal diseases with no HRI diagnoses.

Respiratory diseases with an HRI diagnoses showed increased number of procedures, 0.29 and increased total charges $5027 in addition to a 21% higher risk of death compared with only a respiratory disease diagnosis in the unadjusted model. When adjusted with independent variables respiratory diseases with an HRI diagnosis still showed an increased number of procedures, 0.19,

a 34% increased risk of death and a 7% increased risk of non-routine discharge. Total charges increased by $4378, though this result was not statistically significant.

3.3.3. Stratified Multivariable model outcomes: Heat-related illness and common comorbidities

Stratified multivariable model analysis outcomes are shown in tables 3.2.1., 3.2.2., 3.2.3.. 3.2.4. and 3.2.5. Similar to the above analysis the dependent variable for each outcome was modeled for having either a HRI or a disease grouping and HRI diagnosis compared to not having the diagnosis among hospitalized populations. Heat-related illness diagnoses and each disease grouping with HRI diagnoses were stratified by gender, age category, race, zip code income quartile of patient, insurance status, hospital location and geographic region.

Outcomes for heat-related illness hospitalizations showed increased total charges for age group 0-17 year olds by approximately $7000 compared to non-heat-related illness hospitalizations during this time period. This age group also showed an increased risk of death and non-routine discharge, though not statistically significant. Age groups, 18-39 year olds showed a 2-fold increased risk of dying due to HRI hospitalization and 40-64 year olds showed a 4% increased risk of death due to HRI hospitalization all compared to non-heat-related illness hospitalization. Patients who were uninsured and had a HRI had more than 2 times the risk of dying than those without a heat-related illness diagnosis. Discharge records in the West showed patients have a 16% increased risk of death, though all other hospital locations and regions were at a reduced risk.

Cases with a diagnosis of diabetes and a heat-related illness showed an increase in the number of procedures, 2.72 more, among the youngest age group, 0-17 year olds, while all other outcomes were elevated but not statistically significant. Results from risk of death among patients with a diagnoses of diabetes and HRI were inconclusive due to very few deaths among this population.

Females, in addition to 0-17 year olds had an increased risk of death with a renal disease diagnosis and heat-related illness. Increased risk of death was also seen among males, 18-74 year olds, Black, Hispanic, and those identifying as Other (including Asian/Pacific Islander and Native Americans) for diagnoses of cardiac diseases with a heat-related illness, compared to those with only a cardiac disease diagnosis. Additionally, patients in the lowest zip code income quartiles were 60% more likely to die, as were those without insurance, almost 2.5 times the risk. Patients in urban areas had a 12% increased risk and those in the West had a 48% increased risk of death compared to those patients with only a diagnosis of cardiac disease and no heat-related illness. There were a number of elevated outcomes for patients diagnosed with a respiratory disease and a heat-related illness. A greater number of procedures were shown for females, 0-39 year olds, Black and Hispanics, compared to patients with only a respiratory disease diagnosis. Total charges were also higher among Blacks (> $28,000), and those in the median zip code income quartile (> $28,000) for hospitalizations of a respiratory disease and heat-related illness compared to those hospitalized for just a respiratory disease. Increased risk of death was shown for males and among all racial groups. Age group 0-17 year olds showed a 6.5 times increased risk, 18-39 year olds showed a 5.5 times increased risk and 40-64 year olds showed a 17% increased risk of death in addition to an increase in non-routine discharges among these age groups for respiratory diseases and HRI diagnosis. The lowest two zip code income quartiles showed a 37% and 36% increase in risk of death and an increased risk of non-routine discharge for those diagnosed with a respiratory disease and HRI compared to those with just a diagnosis of a respiratory disease. Additionally patients hospitalized in urban areas showed an increased risk of death, 26%, and increased risk of non-routine discharge, 6%, for those diagnosed with an HRI and respiratory disease.

3.4. Discussion

This study investigated whether patients hospitalized for HRI and common comorbidities had an increased risk for greater negative outcomes. Although most of the multivariable analyses did not show greater negative outcomes compared to non-HRI hospitalizations the stratified analyses indicated that certain groups had significantly increased negative outcomes for hospitalizations due to HRIs and common comorbidities. The stratified analysis was important because prior research supported conclusions that specific vulnerable groups, such as children, had increased negative health outcomes due to heat-related illnesses.[20,21] By using a stratified analysis population denominators represented populations and were more reflective of previous studies' conclusions identifying vulnerable populations with the identified underlying medical conditions. Children, aged 0-17 years, were particularly vulnerable showing increased risk of death and nonroutine discharges for HRIs alone and with additional diagnoses of renal and respiratory diseases. Risk of death among children with a respiratory disease and HRI diagnosis was greater than 6 times that of children with only a respiratory disease diagnosis, without the co-diagnosis of HRI. Children also showed increased number of procedures among diagnoses of diabetes and respiratory diseases with a heat-related illness diagnosis. While children have been noted as particularly vulnerable to high temperatures the current study also highlights a number of significant findings indicating that common comorbidities play a role in further defining which groups of children are at a heightened risk for negative health outcomes due to heat-related illnesses. A recent meta-analysis on the impact of temperature on children's health argued that more research is needed to identify possible modifiers of temperature and its relationship with children's health which is highlighted in the results of this study and asserts the need for further research in this area.[22]

As with children, the elderly are considered at an increased risk of mortality and morbidity due to heat-related illnesses. Though in the current study increased risk of death was seen among age groups 0-64 years old for HRI diagnoses alone and cardiac diseases with a HRI diagnosis as well as with all age groups for respiratory diseases and a HRI diagnosis based on the stratified analyses. The older age groups were not indicative of greater negative outcomes as readily as other age groups in this analysis. This research highlights that underlying medical conditions play a significant role in morbidity and mortality of HRIs among all age groups, not necessarily just children and the elderly. Males also had increased risk of death with diagnosis of cardiac and respiratory diseases with a HRI, though females had a higher risk of non-routine discharge for a diagnosis of respiratory and renal diseases and HRIs.

Overall, in the current study, increased risks of negative health outcomes were more prominent than increased hospital resource use. Increased length of stay was only seen in Black patients diagnosed with a respiratory disease and a HRI while increased costs and number of procedures were also limited to patients with diagnoses of respiratory diseases and a HRI. Although this study did not control for air pollution, previous studies have suggested a synergistic effect between high ambient temperatures and air pollution on morbidity and mortality.[23,24] This can account for the elevated negative outcomes for patients diagnosed with a respiratory diseases and HRIs. Additionally, patients in urban areas had increased risk of death and non-routine discharges for diagnoses of respiratory diseases with an HRI which could also indicate that air pollution in urban areas is a contributing factor to negative health outcomes of hospitalizations due to heat-related illnesses. In conjunction with the known urban heat island effect, individuals in urban areas with underlying medical conditions, particularly respiratory diseases may have compounded risk of hospitalizations for HRIs and more specific interventions will be needed for this vulnerable population compared to smaller urban and rural populations.

Outcomes from heat-related illness diagnoses can range from mild dehydration, due to electrolyte imbalance, to multi-organ failure in patients presenting with heat stroke. Outcomes are directly related to the hospital resource use and costs associated with the diagnoses of heatrelated illness, usually increasing the length of stay and number of procedures performed as well as having an elevated risk of disability and death. Studies have shown that those individuals presenting with the more severe cases of heat-related illness have a greater need for hospital resources and are at a higher risk for negative health outcomes.[25,26] Some researchers have indicated that individuals that die in heat waves are part of a "harvesting" effect in which heat deaths occur in frail or sick individuals whose death was only hastened by the heat and would have subsequently died within a short period had the heat wave not occurred.[27,28] Though other studies suggest that assessing a harvesting effect is complicated due to multiple subsequent heat events and instances where no harvesting effect was detected for short-term follow-up of heat waves.[29,30] Further research is needed to understand the degree of mortality displacement during extreme heat events.

As this study has shown, there are a range of outcomes of hospitalizations for heat-related illnesses and common comorbidities. Increased costs, hospital resources and negative health outcomes will continue to rise as the intensity and frequency of extreme heat events increase. Studies have shown that heat-related illnesses can damage organs and potentially increase an individual's chance of being susceptible to additional heat-related illnesses from future events.[31,32] Understanding the interaction of underlying medical conditions such as diabetes, cardiac, renal, and respiratory diseases is an important indication of whether an individual is both at risk for a heat-related illness and at an increased risk for greater negative health outcomes from hospitalizations. In the conceptual framework for vulnerability assessment (Figure 3.1) potential outcomes are influenced by sociodemographic and environmental characteristics. Understanding

how underlying medical conditions that are exacerbated by extreme heat events contribute to hospitalizations can help reduce the severity and number of hospitalizations due to heat-related illness.

Heat-illness awareness needs be increased among populations with underlying medical conditions. Informational interventions can be included in preventative care programs similar to that for patients with heart disease and diabetes. Conditions that require consistent monitoring which also put these individuals at increased risk for a heat-related illness can improve outcomes if knowledge and understanding of outcomes is related to these vulnerable populations. In addition, health care professionals need to be further trained to diagnosis and treat patients with medical conditions exacerbated by high ambient temperatures. This includes nurses and physicians, but as more and more people seek information online and at retail pharmacies, information concerning the interaction of extreme heat, underlying medical conditions and heatrelated illnesses will need to include secondary and tertiary sources of medical and health information. Heat-related illnesses are potentially greatly underreported and may lead to wrong diagnoses and treatment of illnesses during heat events. Policies regarding educational information for the underlying medical conditions exacerbated by extreme heat will need to increase the level of knowledge among health care professionals in addition to the at risk populations themselves to achieve a broad spectrum of knowledge within society. Although this study is the first to assess nationally representative data on HRI and common comorbidity outcomes, there are limitations. Administrative data is not as accurate as clinical data and HRIs are almost certainly under-coded and diagnoses of exacerbated medical conditions may take precedence over the underlying HRI. In some instances data analysis was limited due to small sample sizes which reduced statistical significance. Air pollution was discussed as a possible confounder or effect modifier though was not accounted for in the analysis though most studies

have found that heat-mortality and morbidity persist even after adjustments. There were a number of strengths to the study as well. Using the NIS as a nationally representative sample of hospitalizations for heat-related illnesses and common comorbidities and applying sample weights allows for the identification of risk factors and outcomes that are generalizable to a much larger population than the sample size. This contributes to the expanding descriptive data and general understanding of heat morbidity and common comorbidities. And while the fully adjusted model analyses for hospitalizations of HRI and common comorbidities did not show increased negative outcomes, stratified analyses showed increased negative outcomes among specific groups hospitalized and indicated which population with underlying medical conditions may be particularly vulnerable to heat events.

In summary, outcomes of individuals hospitalized for heat-related illnesses and common comorbidities differ from those patients with non-HRI hospitalizations. Elevated risk of negative health outcomes and increased hospital resource use was seen in the stratified analysis of patients diagnosed with common comorbidities, in particular those with cardiac and respiratory diseases with HRIs. This study may help increase knowledge among policy makers and clinicians and target interventions among at-risk populations who are vulnerable due to underlying medical conditions.

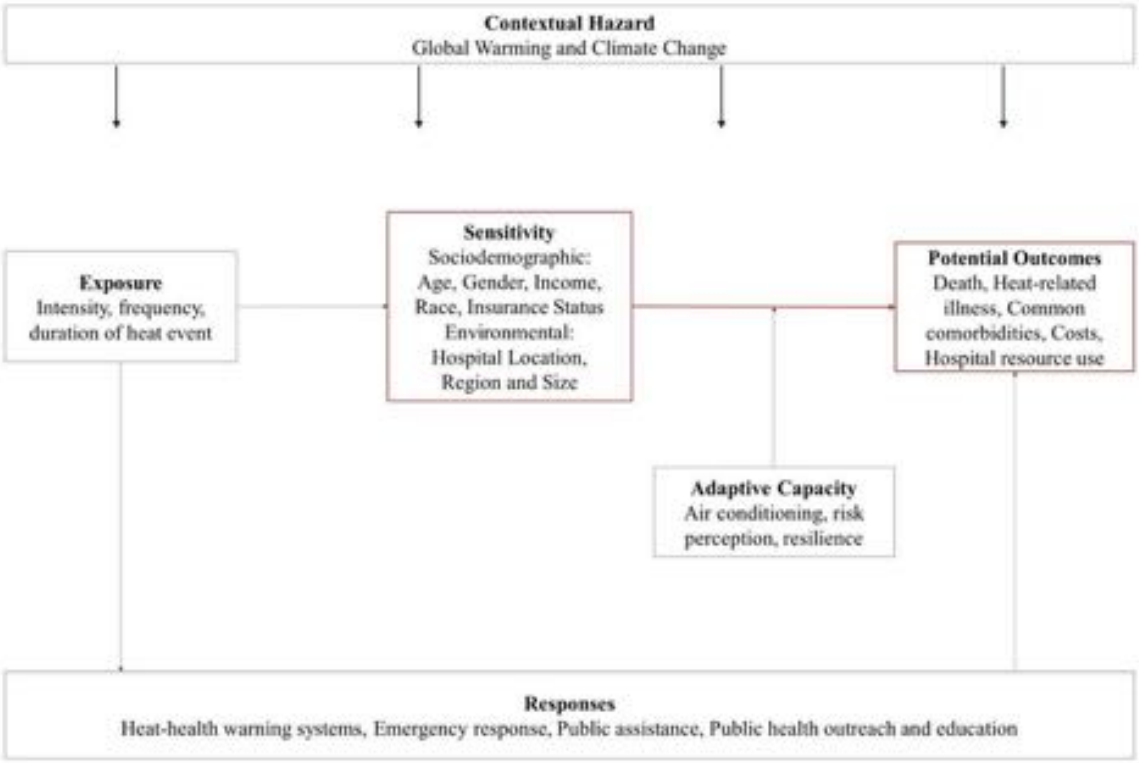


Figure 3.1. Potential outcomes associated with hospitalizations of heat-related illnesses. Common comorbidities along with individual and environmental risk factors associated with heat-related illness diagnoses are analyzed to further elucidate whether populations with underlying medical conditions have greater negative outcomes compared to those without a heat-related illness.

Table 3.1.1. Multivariable model outcomes of hospitalization due to heat-related illnesses, United State 2001-2010 (Summer)

Outcome*	**Unadjusted**	**p-value**	**Adjusted**	**p-value**
Length of Stay (Days)	-1.54	<0.001	-1.67	<0.001
Number of Procedures	-0.93	<0.001	-0.90	<0.001
Total Charges (US Dollars)	-$7098	<0.001	-$10070	<0.001
Death (RR)	0.94	<0.001	0.85	<0.001
(95% CI)	0.91-0.96		0.82-0.88	
Non-Routine Discharge (RR)	0.72	<0.001	0.83	<0.001

(95% CI)	0.71-0.73	0.82-0.84

*Outcomes are compared to all hospitalizations without a heat-related illness diagnosis

Table 3.1.2. Multivariable model of outcomes from hospitalization due to diabetes with a heatrelated illness diagnosis, United State 2001-2010 (Summer)

Outcome*	Unadjusted	p-value	Adjusted	p-value
Length of Stay (Days)	-1.86	<0.001	-1.7	0.001
Number of Procedures	-0.83	<0.001	-0.72	<0.001
Total Charges (US Dollars)	-$10621	<0.001	-$10539	0.001
Death (RR)	-	-	0.84	<0.001
(95% CI)			0.83-0.86	
Non-Routine Discharge (RR)	0.52	<0.001	0.74	<0.001
(95% CI)	0.50-0.55		0.71-0.76	

*Outcomes are compared to all hospitalizations due to diabetes without a heat-related illness diagnosis

Table 3.1.3. Multivariable model of outcomes from hospitalization due to cardiac disease with a heat-related illness diagnosis, United State 2001-2010 (Summer)

Outcome*	Unadjusted	p-value	Adjusted	p-value
Length of Stay (Days)	-1.36	<0.001	-1.21	<0.001
Number of Procedures	-1.03	<0.001	-1.02	<0.001
Total Charges (US Dollars)	-$12736	<0.001	-$13278	<0.001
Death (RR)	0.90	<0.001	0.98	0.05
(95% CI)	0.85-0.95		0.89-1.06	
Non-Routine Discharge (RR)	0.73	<0.001	0.84	<0.001
(95% CI)	0.72-0.74		0.83-0.86	

*Outcomes are compared to all hospitalizations due to cardiac disease without a heat-related illness diagnosis

Table 3.1.4. Multivariable model of outcomes from hospitalization due to renal disease with a heat-related illness diagnosis, United State 2001-2010 (Summer)

Outcome*	Unadjusted	p-value	Adjusted	p-value
Length of Stay (Days)	-3.84	<0.001	-3.16	<0.001
Number of Procedures	-1.35	<0.001	-1.12	<0.001
Total Charges (US Dollars)	-$24155	<0.001	-$23434	<0.001
Death (RR)	0.27	<0.001	0.39	<0.001
(95% CI)	0.25-0.29		0.34-0.42	
Non-Routine Discharge (RR)	0.28	<0.001	0.53	<0.001
(95% CI)	0.27-0.29		0.52-0.54	

*Outcomes are compared to all hospitalizations due to renal disease without a heat-related illness diagnosis

Table 3.1.5. Multivariable model of outcomes from hospitalization due to respiratory disease with a heat-related illness diagnosis, United State 2001-2010 (Summer)

Outcome*	Unadjusted	p-value	Adjusted	p-value
Length of Stay (Days)	-0.47	<0.001	-0.27	0.43
Number of Procedures	0.29	<0.001	**0.19**	0.04
Total Charges (US Dollars)	$5027	<0.001	$4378	0.10
Death (RR)	1.21	<0.001	**1.34**	<0.001
(95% CI)	1.15-1.25		1.32-1.36	
Non-Routine Discharge (RR)	0.90	<0.001	**1.07**	<0.001
(95% CI)	0.87-0.93		1.06-1.08	

*Outcomes are compared to all hospitalizations due to respiratory disease without a heat-related illness diagnosis

Table

3.2.1. Stratified multivariable model of outcomes from hospitalization due to heat-related illnesses, United State 2001-2010 (Summer)

	Outcome						
Stratified Variable#	**Length of Stay (days)**	**Number of Procedures**	**Total Charges (US Dollars)**	**Death**		**Non-Routine Discharge**	
				RR	**(95%CI)**	**RR**	**(95%CI)**
Gender							
Male	-1.77	-0.69	-$8110	0.76	0.76-0.77	0.62	0.62-0.62
Female	-1.40	-0.91	-$11291	0.83	0.83-0.84	0.84	0.83-0.85
Age Categories							
0-17	-1.04	-0.42	**$7027**	2.41†	-	1.00†	0.95-1.05
18-39	-1.71	-0.77	-$6768	**2.08**	1.83-2.33	0.72	0.72-0.73
40-64	-1.60	-0.96	-$11245	**1.04**	1.00-1.08	0.71	0.69-0.72
65-74	-1.90	-1.11	-$16703	0.92†	0.91-1.03	0.78	0.78-0.79
75+	-1.84	-0.82	-$12615	0.77	0.74-0.80	0.77	0.76-0.78
Race/Ethnicity							
Black	-1.53	-0.63	-$5546	0.41†	0.36-0.46	0.79	0.79-0.81
White	-1.64	-1.01	-$10914	0.98	0.84-1.14	0.79	0.78-0.80
Hispanic	-1.31	-0.85	-$7782	1.05	0.96-1.14	0.80	0.79-0.81
Other	-1.63	-0.96	-$17486	1.57†	1.43-1.74	0.68	0.67-0.99
Median Income Quartile*							
0-25th percentile	-1.48	-0.78	-$7425	1.01†	1.00-1.02	0.78	0.77-0.79
26th to 50th percentile	-1.46	-0.95	-$8728	0.89	0.83-0.96	0.66	0.65-0.67
51st to 75th percentile	-1.71	-1.05	-$12648	0.60	0.64-0.66	0.66	0.65-0.68
76th to 100th percentile	-1.80	-0.97	-$12134	0.89	0.82-0.97	0.77	0.77-0.79
Insurance Status							
Insured	-1.63	-0.95	-$10645	0.73	0.70-0.76	0.81	0.80-0.82
Uninsured	-1.39	-0.74	-$6749	**2.30**	2.12-2.49	0.79†	-
Hospital Location							

Rural	-1.51	-0.80	-$7825	0.44	0.36-0.56	0.74	0.72-0.75
Small Urban Cluster	-1.45	-0.70	-$6120	0.56	0.49-0.64	0.61	0.60-0.62
Urban Area	-1.60	-0.96	-$10661	1.01†	0.97-1.04	0.77	0.77-0.78
Hospital Region							
Northeast	-1.95	-0.88	-$10539	0.94†	0.87-1.02	0.83	0.82-0.83
Mid-West	-1.41	-0.97	-$6879	0.87	0.83-0.92	0.83	0.82-0.83
South	-1.78	-1.01	-$11607	0.72	0.67-0.76	0.71	0.70-0.72
West	-0.96	-0.84	-$8700	**1.16**	1.10-1.24	0.98†	-

*zip code of patient, †p-value > 0.05, #Reference group for all stratified variables are those hospitalized without a heat-related illness

Table 3.2.

2. Stratified multivariable model of outcomes from hospitalization due to diabetes with a heat-related illness diagnosis, United State 2001-2010 (Summer)

Stratified Variable[#]	Outcome						
	Length of Stay (days)	Number of Procedures	Total Charges (US Dollars)	Death		Non-Routine Discharge	
				RR	(95%CI)	RR	(95%CI)
Gender							
Male	-1.68	-0.32	-$10051	-		0.67	0.64-0.71
Female	-1.69†	-0.73†	-$11133†	-		0.62	0.57-0.68
Age Categories							
0-17	1.02†	**2.72**	$28901†	-		-	
18-39	-1.51	-0.27†	-$7513†	-		1.04†	0.89-1.21
40-64	-1.79	-0.78	-$11911	-		0.58	0.51-0.66
65-74	-1.23†	-0.65†	-$12299†	-		0.98	0.97-0.99
75+	-2.01	-1.08	-$13436	-		0.57	0.53-0.62
Rural							
Small Urban Cluster							
Urban Area							

Race/Ethnicity						
Black	-2.22†	-0.35†	-$12560†	-	0.53	0.46-0.62
White	-1.61	-0.91	-$9312	-	0.66	0.62-0.69
Hispanic	-1.75†	-0.25†	-$9378†	-	0.58	0.51-0.66
Other	-0.74†	-1.45†	-$23225†	-	**1.72**	1.68-1.76
Median Income Quartile*						
0-25th percentile	-1.71†	-0.42†	-$6689†	-	0.75	0.70-0.81
26th to 50th percentile	-1.48†	-0.62	-$12581	-	0.91	0.89-0.92
51st to 75th percentile	-2.24	-0.96	-$11705†	-	0.54	0.49-0.61
76th to 100th percentile	-1.36†	-1.24	-$14026†	-	0.48	0.73-0.55
Insurance Status						
Insured	-1.74	-0.71	-$11007	-	0.67	0.65-0.70
Uninsured	-1.69†	-0.78	-$8754†	-	0.43	0.33-0.55
Hospital Location						
	-1.26† -1.78	-0.26† -0.79	-$2474† -$12043	- 0.95† 0.77-1.17	-1.54† -0.56† -$6572† - 0.71 0.68-0.74	0.29 0.25-0.36
Hospital Region						
Northeast	-1.63†	-0.51†	-$7090†	-	0.76	0.70-0.83
Mid-West	-1.40†	-0.79†	-$4089†	-	0.56	0.48-0.65
South	-1.70	-0.69	-$10211	-	0.71	0.67-0.77
West	-1.83†	-0.90	-$16738	-	0.50	0.46-0.55

*zip code of patient, †p-value > 0.05, #Reference group for all stratified variables are those hospitalized for diabetes without a heatrelated illness

Table 3.2.

3. Stratified multivariable model of outcomes from hospitalization due to cardiac disease with a heat-related illness diagnosis, United State 2001-2010(Summer)

	Outcome						
Stratified Variable[#]	**Length of Stay (days)**	**Number of Procedures**	**Total Charges (US Dollars)**	**Death**		**Non-Routine Discharge**	
				RR	**(95%CI)**	**RR**	**(95%CI)**
Gender							
Male	-1.17	-1.17	-14983	**1.08**	1.04-1.12	0.90	0.89-0.91
Rural							
Small Urban Cluster							
Urban Area							

Female	-1.30	-0.74	-11482	0.95†	-	0.89	0.89-0.90
Age Categories							
0-17	-5.26†	-2.23†	-46823†	-		-	
18-39	0.67†	-0.41†	3126†	**3.11**	2.39-4.06	1.04†	0.98-1.10
40-64	-1.21	-1.19	-15416	**1.66**	1.42-1.95	0.94	0.92-0.98
65-74	-1.33	-1.28	-18848	**1.46**	1.22-1.75	0.95	0.93-0.96
75+	-1.48	-0.87	-11989	0.80	0.76-0.85	0.85	0.85-0.87
Race/Ethnicity							
Black	-1.71	-0.53	-10470†	**1.56**	1.29-1.89	0.89	0.86-0.91
White	-1.21	-1.11	-14479	0.90	0.86-0.94	0.83	0.82-0.84
Hispanic	-0.28†	-1.04	-7151†	**1.04**	1.03-1.05	0.95	0.92-0.98
Other	-1.56†	-0.87†	-24920†	**1.88**	1.43-2.46	0.85	0.80-0.91
Median Income Quartile*							
0-25th percentile	-0.75†	-0.70	-6555†	**1.60**	1.43-1.79	0.93	0.92-0.95
26th to 50th percentile	-1.19	-1.14	-12939	0.85†	0.71-1.01	0.73†	-
51st to 75th percentile	-1.65	-1.26	-17366	0.40	0.30-0.54	0.80	0.77-0.82
76th to 100th percentile	-1.46	-1.08	-20353	0.75	0.61-0.91	0.89	0.87-0.91
Insurance Status							
Insured	-1.25	-1.05	-14204	0.89	0.81-0.97	0.82	0.81-0.83
Uninsured	-0.54†	-0.62†	-8187†	**2.47**	1.99-3.06	**1.29**	1.22-1.36
Hospital Location							
	-1.41†	-0.56†	-9600†	0.54	0.52-0.57	0.84	0.80-0.88
	-1.57	-0.66	-9250	0.52	0.39-0.70	0.65	0.62-0.67
	-1.14	-1.09	-14913	**1.12**	1.09-1.14	0.88	0.87-0.89
Hospital Region							
Northeast	-1.39	-1.00	-13716	0.93†	0.76-1.12	0.97†	-
Mid-West	-0.82†	-0.88	-2715†	0.79†	0.60-1.04	0.93†	-
South	-1.44	-1.04	-15583	0.67	0.57-0.79	0.70	0.70-0.71
West	-0.87†	-1.06	-15164	**1.48**	1.30-1.67	0.98†	-

*zip code of patient, †p-value > 0.05, #Reference group for all stratified variables are those hospitalized for cardiac disease without a heat-related illness

Table 3.2.

4. Stratified multivariable model of outcomes from hospitalization due to renal disease with a heat-related illness diagnosis, United State 2001-2010(Summer)

Rural
Small Urban Cluster
Urban Area

Stratified Variable[#]	Outcome						
	Length of Stay (days)	Number of Procedures	Total Charges (US Dollars)	Death		Non-Routine Discharge	
				RR	(95%CI)	RR	(95%CI)
Gender							
Male	-3.26	-1.32	-24631	0.13	0.11-0.16	0.46	0.45-0.48
Female	-2.06	-0.77	-11621	**1.28**	1.20-1.36	0.82	0.80-0.84
Age Categories							
0-17	-3.68†	-0.55†	-13010†	**3.46**	2.37-5.06	0.54	0.42-0.70
18-39	-2.84	-1.19	-21150	0.22	0.15-0.34	0.34	0.31-0.37
40-64	-3.63	-1.49	-26163	0.13	0.10-0.17	0.36	0.35-0.39
65-74	-2.95	-1.02	-21079	-	-	0.61	0.61-0.62
75+	-2.08	-0.81	-17371	0.96†	0.86-1.09	0.82	0.81-0.83
Race/Ethnicity							
Black	-2.60	-1.10	-14958	0.15	0.11-0.23	0.67	-
White	-3.38	-1.34	-25123	0.49	0.44-0.55	0.53	0.51-0.54
Hispanic	-3.32	-1.46	-29273	0.24	0.16-0.37	0.53	0.51-0.57
Other	-3.08	-0.88	-24112†	-	-	0.19	0.16-0.24
Median Income Quartile*							
0-25th percentile	-2.94	-1.12	-19724	0.23	0.18-0.29	0.55	0.45-0.57
26th to 50th percentile	-3.38	-1.40	-24263	0.46	0.38-0.55	0.50	0.49-0.52
51st to 75th percentile	-3.33	-1.34	-27045	0.32	0.24-0.41	0.49†	-
76th to 100th percentile	-2.99	-1.32	-24954	0.65	0.54-0.78	0.68	0.66-0.70
Insurance Status							
Insured	-3.16	-1.30	-24247	0.49	0.44-0.55	0.56	0.55-0.57
Uninsured	-2.85	-1.09	-18417	-	-	0.40	0.38-0.99
Hospital Location							
	-1.63†	-0.76	-12310†	-	-	0.48	0.44-0.53
	-2.07	-0.88	-10181	0.51	0.38-0.68	0.40	0.37-0.43
	-3.34	-1.35	-25642	0.40	0.35-0.45	0.55	0.54-0.56

Table 3.2.

Hospital Region							
Northeast	-3.43	-0.99	-23275	0.48	0.39-0.60	0.60†	-
Mid-West	-2.92	-1.44	-21981	-	-	0.45	0.42-0.48
South	-3.33	-1.40	-22970	0.50	0.44-0.57	0.45	0.44-0.47
West	-2.65	-1.13	-26329	0.24	0.18-0.32	**3.89**	3.82-3.95

*zip code of patient, †p-value > 0.05, #Reference group for all stratified variables are those hospitalized for renal disease without a heat-related illness

Rural
Small Urban Cluster
Urban Area

5. Stratified multivariable model of outcomes from hospitalization due to respiratory disease with a heat-related illness
diagnosis, United State 2001-2010(Summer)

	Outcome						
Stratified Variable#	**Length of Stay (days)**	**Number of Procedures**	**Total Charges (US Dollars)**	**Death**		**Non-Routine Discharge**	
				RR	**(95%CI)**	**RR**	**(95%CI)**
Gender							
Male	-0.42	0.09†	2651†	**1.22**	1.18-1.26	1.03†	-
Female	-0.06†	**0.37**	7362†	1.08†	1.06-1.11	**1.07**	1.07-1.09
Age Categories							
0-17	-0.27†	**1.95**	17637†	**6.53**	5.39-7.91	**3.32**	3.19-3.45
18-39	0.73†	**0.97**	**28689**	**5.57**	4.83-6.42	**1.27**	1.20-1.35
40-64	-0.10†	0.29†	4522†	**1.17**	1.03-1.33	**1.06**	1.04-1.08
65-74	-0.34†	0.07†	1792†	0.81	0.68-0.96	1.00†	0.98-1.02
75+	-1.16	-0.26†	-4158†	0.89	0.83-0.97	0.89†	-
Race/Ethnicity							
Black	**2.43**	**1.33**	**28372**	**1.73**	1.51-1.97	**1.45**	1.42-1.48
White	0.66†	0.10†	538†	**1.07**	1.03-1.11	0.96	0.95-0.97
Hispanic	-0.34†	**0.85**	11407†	**1.38**	1.24-1.54	1.02†	0.97-1.07
Other	-3.30†	-0.05†	-28302†	**2.52**	2.16-2.94	**1.46**	1.41-1.50
Median Income Quartile*							
0-25th percentile	-0.71†	0.22†	2876†	**1.37**	1.23-1.52	**1.05**	1.04-1.05
26th to 50th percentile	1.02†	0.23†	**18829**	**1.36**	1.22-1.52	1.09†	-

Table 3.2.

51st to 75th percentile	-0.79†	0.08†	-8333†	0.86†	0.73-1.02	**1.04**	1.03-1.05
76th to 100th percentile	-0.85†	0.31†	898†	1.12†	0.97-1.30	1.02†	1.00-1.04
Insurance Status							
Insured	-0.28†	0.11†	4358†	1.01†	0.78-1.29	1.02	1.01-1.02
Uninsured	-0.25†	**0.79**	5026†	**3.43**	3.28-3.59	**1.32**	1.26-1.38
Hospital Location							
	-2.02†	-0.24†	-8929†	-	-	0.68	0.63-0.73
	-0.38†	0.34†	828†	1.07†	0.88-1.31	1.00†	-
	-0.12†	0.20†	5906†	**1.26**	1.20-1.31	**1.06**	1.05-1.06
Hospital Region							
Northeast	-1.08†	0.12†	-2189†	**1.54**	1.39-1.73	0.98	0.98-0.99
Mid-West	0.57†	0.10†	8371†	1.10†	0.91-1.34	**1.18**	1.17-1.20
South	-0.35†	0.19†	1250†	**1.37**	1.24-1.51	0.90	0.93-0.94
West	0.10†	0.29†	12122†	0.92	0.88-0.95	**1.10**	1.09-1.10

*zip code of patient, †p-value > 0.05, #Reference group for all stratified variables are those hospitalized for respiratory disease without a heat-related illness

Rural
Small Urban Cluster
Urban Area

Chapter 4. Association of heat-related illness morbidity patterns and costs related to heatrelated illness hospitalizations

4.1. Introduction

Assessing the impact of climate change on human health and the economy is an enormous task.[1,2] These health impacts will greatly increase economic costs, such as health care expenditures and implementation of adaptive measures, both in preparing for and recovering from hazards related to climate change.[3] Recent studies on the economic cost of climate change have focused on emission rates of greenhouse gases, particularly carbon dioxide, and the impact they will have on global warming. Such studies have been on the estimated cost of reducing our use of fossil fuels and on the implementing carbon taxes but there have been few estimates on the actual economic burden to public health attributed to climate change.[4-6] Previous studies on climate change and health have estimated costs associated for malnutrition, waterborne disease, and malaria[7-9] though little research has been done to estimate the costs of heat morbidity and mortality.

Understanding how heat waves affect morbidity and mortality will be an important factor in how climate change will impact human health in future heat events. Current research has already shown that mortality and morbidity increase during extreme heat events.[10-12] For example, Basu et al. (2012), observed a 393% increase in heat illness hospitalizations, a 3% increase in ischemic stroke hospitalizations and a 15% increase in acute renal failure hospitalizations for every 10F increase in temperature above the mean ambient temperature in a study from California.[13] Studies also predict that there will be an increase in mortality and morbidity from heat-related illnesses from future extreme heat events. Knowlton et al. estimated premature

mortality from extreme heat events in the New York City region to increase by 47% to 95% by mid-21st century compared with the 1990's.[14] As heat events increase, deaths and hospitalizations due to heatrelated illnesses will continue to incur greater economic costs. Only a handful of studies have either identified or estimated costs associated with high ambient temperatures and extreme heat events.[15-17] Knowlton et al. identified total health costs associated with a 2006 California heat wave to be $5.4 billion, though a significant portion of the estimated case was due to premature death ($5.1 billion).[16] Interventions such as heat-health warning systems (HHWS) and air conditioner use have proven effective in reducing heat morbidity and mortality though there is a gap in the research providing cost-effective and cost benefit analyses for policymakers to implement strategies for reducing heat mortality and morbidity.[18] By examining the conceptual framework (Figure 4.1), hospitalization costs are indirectly influenced by society's adaptive capacities. Responses to an extreme heat events and how those responses directly relate to potential outcomes provide information on cost benefit analyses of interventions used to prevent heat-related illness hospitalizations. By exploring these two facets within the vulnerability assessment framework and examining how adaptive capacities and responses impact heat-related illness hospitalization costs, this research will yield additional information to on the economic burden of heat morbidity. The goal of the current study then is to calculate the cost of hospitalizations due to heat-related illnesses in the United States from 2001 to 2010. Although there are a number of different projections and scenarios for the future climate, all estimate an increase in ambient temperatures and extreme heat events. This study will also aim to estimate the future cost of hospitalizations due to heat-related illnesses based on projections from a number of these studies. Additionally this study will briefly look at air

conditioning use and cost in 2009 as a potential cost-effective strategy to combat heat morbidity. Because there is a limited amount of information regarding the economic cost of heat-related morbidity and mortality, this study will be important for examining the costs of public health preparedness and responses to climate change and extreme heat events.

4.2. Methods

4.2.1. Data Sources

The primary source of data for this study was the 2001 to 2010 Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS), which was developed by the Agency for Healthcare Research and Quality (AHRQ). The NIS is the largest all-payer care database, with data from approximately 8 million hospitalizations per year (about 20% of all hospital discharges in the United States). (HCUP) The NIS includes data on patient demographics and hospital characteristics, primary and secondary diagnoses coded according to the *International Classification of Diseases, Ninth Revision* (ICD-9) (with up to 15 diagnoses available for the years 2001-2008 and up to 25 diagnoses for 2009-2010), primary and secondary procedures (ICD-9 coding up to 15 diagnoses available for the years 2001-2008 and up to 25 diagnoses for 2009-2010), type and source of admission, discharge disposition, primary payer type, total hospital charges, and length of stay. Stratification and weighting variables allow calculation of national estimates and account for the complex sampling design.[19,20]

Data on air conditioner use and cost was derived from the Residential Energy Consumption Survey (RECS), a national household survey conducted by the United States Energy Information Administration (EIA). In 2009 surveys were collected from approximately 12,000 households,

which were nationally representative of the 110 million residential U.S. households. The variables from the RECS used in this study include census region, state and average air conditioner cost per household.[21]

4.2.2. Subjects and Definitions

The study population for HRI consists of patients in the 2001-2010 NIS with at least one diagnosis of a heat-related illness (ICD-9 codes 992.0 – 992.9) from 2001 to 2010. The main outcome assessed in this study was total billed charges for hospitalization. Total billed charges were converted to individual hospital all-payer inpatient costs by applying the AHRQ hospitalspecific cost-to-charge ratios to total charges within the NIS dataset. Individual patient records were matched by hospital identification numbers and linked to AHRQ hospital-specific cost-tocharge ratios. For hospitals without a listed all-payer inpatient cost-to-charge ratio a group average all payer-inpatient cost was used. Some years, records for hospitals in Texas, Pennsylvania and Hawaii did not include either cost-to-charge ratios. For these hospitals the group average all payer-inpatient cost was substituted with a cost-to-charge ratio from hospitals in the same census region matched on hospital location and bed size.

4.2.3. Statistical Analysis

Descriptive statistics were used to report hospitalization numbers, aggregate costs, mean costs, standard deviations (SD±) and median costs. All analyses were weighted to obtain national estimates and yearly costs were adjusted to 2013 US dollars accounting for inflation, using the medical consumer price index. Estimated costs of hospitalizations due to heat-related illnesses of future events were based on analyses of studies using climatic models predicting an increase in

the intensity and frequency of extreme heat events. Studies by Wu, et al., Gao, et al., and Lau, et al. indicate at least a 2-fold increase but possibly as high as a 7-fold increase by mid-to-late century for the number of extreme heat events per year compared to recent years.[22-24] The current analysis includes a 50%, 2-fold, 5-fold and 7-fold increase to the 2010 aggregate costs of heatrelated illness hospitalizations which represents estimated costs of hospitalization for predicted events occurring mid-21st century.

All statistical analyses were performed using SAS 9.3. This study was approved by the Institutional Review Board of Hunter College and conforms to the HCUP data use agreement.

4.3. Results

4.3.1. Costs of heat-related illness hospitalizations

Table 4.1. shows the actual aggregated, mean and median costs of hospitalizations due to heatrelated illnesses from 2001 to 2010. As the number of cases increase over the time period, the inpatient costs also increase (all costs in US Dollars). A low of $30.1 million is seen in 2004 and a high of $81.5 million in 2010. The average cost for the ten year period is about $52.7 million while the total aggregate cost for the time period is just over half a billion dollars ($542.7 million). Mean and median adjusted costs remain similar over the 10 year period, though both increase in 2010, due to the high number of total cases in that year compared to previous years.

4.3.1. Estimated costs of heat-related illness hospitalizations

Estimated costs for future heat events were based on the 2010 aggregated costs of heat-related illness hospitalizations and are shown in table 4. 2. A 50%, 2-fold, 5-fold and 7-fold increase in

the number of heat-related illness hospitalization costs was calculated. These resulted in estimates close to and above half a billion US dollars for a 5-fold ($407.5 million) and 7-fold ($570.5 million) increase based on current costs of hospitalizations for heat-related illnesses annually. Moderate increases were seen in the 50% and 2-fold estimated costs, at $122.3 million and $163 million per year.

4.3.1. Costs of air conditioner use in the United States, 2009

Table 4.3. gives the total and air conditioning energy expenditures for all homes in the United States in 2009 as well as the total average energy cost and average energy cost of air conditioning. Average energy cost for air conditioning in the United States in 2009 was $196 per household. Higher averages were seen in new homes in the South and West, while older homes in the Northeast and Mid-West had below average costs for air conditioning.

4.4. Discussion

According to the results, hospital all-payer inpatient costs due to HRI have risen over the time period 2001-2010. Additionally, estimates show that based on projections from climate scenarios where global temperature continue to rise and heat waves become more frequent and intense, the economic cost from hospitalizations due to heat-related illness will also increase by mid-century. The estimated costs which are based on a number of studies that take into account various climate models and a range of possible scenarios.[22-24] These scenarios include the Special Report on Emission Scenarios (SRES) which is used by the Intergovernmental Panel on Climate Change (IPCC) to describe greenhouse gas emission projections of possible future climate change and the Representative Concentration Pathways (RCPs) which greenhouse gas

concentration trajectories used to model possible climate futures.[25] In some cases adaptation and low carbon emission rates account for the lower end estimates while the upper end estimates are largely due to carbon emission rates that will remain similar to today's rates or increase in greenhouse gas emissions, allowing for greater warming of the climate.

Climate models have relied on these projections of greenhouse gas emissions and concentration trajectories to determine rates of global warming and predictions on what temperatures will be in our future climate.[26] Because of this most of the cost analyses concerning global warming and climate change have been on how to mitigate or reduce greenhouse gas emissions.[5,27]

Additionally, even if all greenhouse gas emissions were stopped, these gases tend to stay in the atmosphere for long periods of time and concentrations would continue to rise and stay elevated for hundreds of years.[28] Little is known on the economic costs and the costs and benefits of adaptive measures to protect human health from climate change outside of reducing greenhouse gas emissions. Current global knowledge on these economic impacts is generally of low quality and of limited relevance to policy makers concerned with protecting health.[29] Because there is limited quality information available on costs associated with climate change and health, health will need to be an important component in current and future climate change adaptation, especially those related to economic impacts.

The recent United States National Climate Assessment (NCA) included key messages concerning climate change and health; *a*) Climate change threatens human health, and those impacts are already underway in the United States; *b*) climate change will amplify existing nationwide health threats, especially for vulnerable communities; and *c*) preparedness and prevention can protect people from some of these threats, but given that national capacity to

adapt to increasing threats may be limited in the future, early, preemptive action has the most impact potential.[30] Despite the risks and recent priorities to include the impact of climate change on health as a focus for research and policy, funding has been insufficient.[31] It has also been stated that the effects of climate change will be felt greatest in populations already at a disadvantage and hence are most vulnerable, including residents of developing countries, elderly, minorities and those of lower socioeconomic status. Climate change has the potential to exacerbate the cycle of poverty and vulnerability if improvements to adaptation methods are not undertaken among these at risk population. Investment in preparedness, awareness and mitigation can help in terms of both inequality and health.[32]

However, studies that assess the effectiveness and cost-effectiveness of interventions to protect health from climate change have also been limited.[33] Heat-health warning systems (HHWS), which are plans that alert and advise populations to mitigate the dangers of heat from high ambient temperatures and heat waves, have been established to some degree though only a small number of studies provide the evaluation needed to prove effectiveness in terms of reaching target populations and reducing adverse health effects.[34] While some studies provide evidence that HHWS are effective[35,36] there has only been one peer-reviewed article to date that has evaluated the cost-effectiveness of such a system.[37] Ebi et al. estimated that the cost of a HHWS in Philadelphia at approximately $210,000 over a 3-year period while the net benefits were around $486 million for 112 lives saved (benefits were calculated using the Environmental Protection Agency's value of a statistical life).[37] Additional cost estimates for HHWS have come from state or municipal reports; one from California indicates that it would cost around $570,000 to develop a statewide warning system and a similar estimate for intervention during excessive

heat warnings annually.[38] In comparison, hospitalizations for heat-related illnesses in 2010 cost $3.1 million in California and $4.2 million Pennsylvania, according to the data from this study. Additionally, a report on the potential economic cost to the state of New Mexico from climate change indicated that medical care costs of $7 to $45 million would be needed for 'heat waverelated illnesses'.[39] Heat-health warning systems include meteorological data combined with a variety of intervention strategies. Heat health warning systems may appear costly due to the logistics of setting up the system, though medical care and hospitalization costs as shown in this study are greater than the cost of the HHWSs mentioned above. These efforts are a cost effective way for public health officials and municipalities to reduce heat-related illness morbidity and mortality.

In addition, educating the public on personal health protection measures, such as air conditioner use, will be a necessary part of HHWSs. However, even though the use of air conditioning as a protective measure against heat-related illness has proven to be highly beneficial, the increased energy demand during summer months is both a strain on electrical grids and a contributor to increased greenhouse gas emissions.[40,41] When looking at household level air conditioning it can be a cost effective way of reducing heat-related illness hospitalizations, with householders in the United States spending, on average, $196 per year on electrical costs for cooling their homes. Overall cost of energy consumption for air conditioning by state though is in the hundreds of millions of dollars. Problems with electrical infrastructure and resource use argue against the expanding use of air conditioning on the larger scale now and in the future. Though public health officials will need to make difficult decisions about promoting the use of air conditioning among

vulnerable populations in the short-term and sustainability of air conditioning use in the long term using fuel efficient methods with reduced greenhouse gas emissions.

The primary aim of public health is to promptly detect health threats and intervene in a timely manner. Given the multi-disciplinary nature of climate change and the complexity of activities needed to achieve timely interventions, implementation has been difficult. Additionally, funding for research on the health impacts of climate change has been inadequate and remains focused on carbon emissions and the economic impact carbon taxes and caps on carbon emissions will have on society.[33] Climate change and health is a rapidly growing area of research that will benefit from including studies of the economic costs, cost-effectiveness and cost benefits of the public health burden due to climate change. Cost-effectiveness and cost benefits of interventions to protect health from climate change may also improve responses from policy-makers and politicians in directing funds for further research.

In summary, these data show the substantial cost associated with hospitalizations due to heatrelated illnesses and projected estimates for the cost of these hospitalizations in the future climate. The estimates are conservative and represent the absolute minimum cost associated with hospitalizations due to heat-related illnesses, because HRIs themselves are largely underreported with underlying medical conditions, such as cardiac and respiratory diseases, taking precedence as the primary diagnosis for hospitalizations during heat events. While known interventions such as air conditioner use may be beneficial in the short term, more information regarding the cost benefits of additional interventions are needed. Heat-health warning systems have been shown to be a cost-effective intervention, though little evaluation has been done both in terms of economic and health benefits. These intervention strategies are needed to substantiate the evidence needed to both show economic effectiveness and secure funding and research focus on climate change

and health. By examining the costs associated with hospitalizations of heat-related illnesses we have initiated some of the first steps in identifying economic factors that influence the impact of climate change on health.

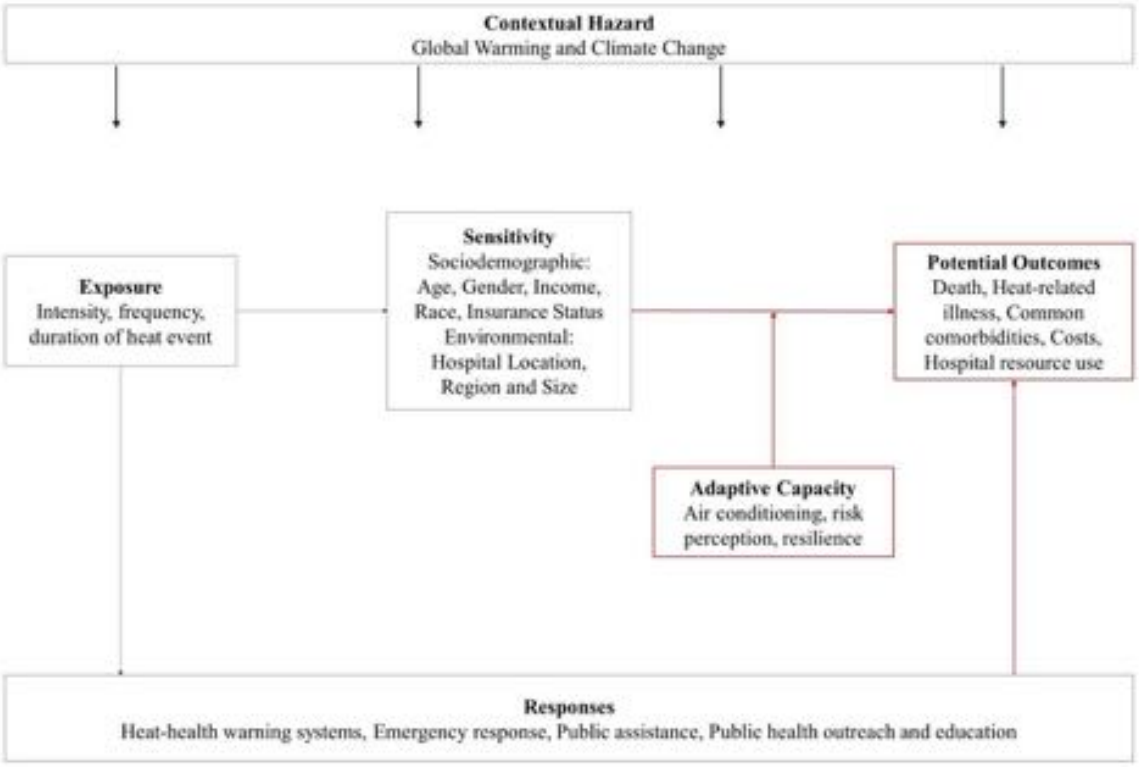


Figure 4.1. Explores costs associated with hospitalizations of heat-related illnesses. As heat-related illness hospitalizations increase with increasing frequency of extreme heat events, costs will continue to rise. Hospitalization costs are compared to the costs of air conditioning and established heat-health warning systems to determine cost-effectiveness of current intervention strategies.

Table 4.1. Hospitalization costs due to heat-related illnesses, United States, 2001-2010 (Summer)

	N (weighted)	Aggregate Costs (millions)		Mean (±SD) Costs	Median Costs	2013*	
			2013*				2013*
HRI (overall)	72284	$416.2	$542.5	$5,758(±24,790)	$7,505(±32,310)	$3,295	$4,295
2001	6443	$26.6	$41.5	$4,124(±12,768)	$6,427(±19,898)	$2,430	$3,787
2002	6654	$33.1	$49.3	$4,968(±21,327)	$7,395(±31,747)	$2,772	$4,126
2003	5589	$28.9	$41.4	$5,171(±19,921)	$7,399(±28,506)	$2,890	$4,135
2004	4346	$22.3	$30.6	$5,135(±15,358)	$7,040(±21,055)	$3,071	$4,210
2005	8090	$48.9	$64.3	$6,043(±32,592)	$7,950(±42,871)	$3,224	$4,241
2006	9479	$57.6	$72.8	$6,077(±24,348)	$7,654(±30,789)	$3,439	$4,349
2007	7189	$39.2	$47.5	$5,457(±22,889)	$6,609(±27,719)	$3,371	$4,082
2008	6988	$46.8	$54.7	$6,691(±29,343)	$7,813(±34,265)	$3,883	$4,532
2009	6433	$38.4	$43.5	$5,975(±18,987)	$6,763(±21,490)	$3,622	$4,100
2010	11074	$74.5	$81.5	$6,723(±30,929)	$7,358(±33,851)	$7,871	$7,615

*Costs adjusted to 2013 US dollars, accounting for inflation

Table 4.2. Estimated hospitalization costs due to heat-related illnesses

	2010	50% Estimated Increase*	2-fold Estimated Increase*	5-fold Estimated Increase*	7-fold Estimated Increase*
Aggregate Costs of Heatrelated Illness Hospitalizations	$81.5 million	$122.3 million	$163 million	$407.5 million	$570.5 million

*Estimated increases in 2013 US dollars, accounting for inflation

Table 4.3. Total energy and air conditioning costs in households in the United States, 2009

States and State Grouping[#]	Total Energy Expenditures (billion Dollars)		Average Energy Expenditures (dollars per household)	
	Total	Air Conditioning	Total	Air Conditioning
Total U.S.	**229.95**	**22.27**	**2024**	**196**
Connecticut, Maine, New Hampshire, Rhode Island, Vermont	8.95	0.13	2949	43
Massachusetts	6.13	0.1	2478	40
New York	17.58	0.55	2446	77
New Jersey	9.67	0.57	3065	181
Pennsylvania	11.57	0.49	2353	100
Illinois	9.84	0.5	2067	105
Indiana, Ohio	13.64	0.53	1948	76
Michigan	8.21	0.13	2148	35
Wisconsin	4.38	0.06	1926	29
Iowa, Minnesota, North Dakota, South Dakota	7.61	0.21	1947	53
Kansas, Nebraska	3.24	0.23	1786	129
Missouri	4.43	0.35	1892	149
Virginia	6.42	0.7	2162	237
Delaware, Washington DC, Maryland, West Virginia	7.91	0.56	2313	165
Georgia	7.17	1.09	2067	315
North Carolina, South Carolina	10.1	1.26	1878	234
Florida	14.12	3.92	2020	561
Alabama, Kentucky, Mississippi	9.5	1.41	2048	304
Tennessee	4.34	0.51	1774	209
Arkansas, Louisiana, Oklahoma	7.78	1.12	1833	264
Texas	18.42	4.45	2160	521
Colorado	2.96	0.05	1551	25
Idaho, Montana, Utah, Wyoming	3.32	0.11	1650	54
Arizona	4.46	1.28	1959	561

Nevada, New Mexico	3.08	0.46	1802	268
California	17.36	1.34	1422	109
Alaska, Hawaii, Oregon, Washington	7.78	0.15	1646	32

#States and state groupings categorized by US EIA, 2009

Chapter 5. Discussion

5.1. Overview of the dissertation

This cross-sectional study of hospitalizations in the United States due to heat-related illnesses aimed to expand the limited knowledge of the risk factors, outcomes and costs associated with heat morbidity. First, risk factors were identified by comparing all heat-related illness (HRI) hospitalizations over a 10-year time period during the summer months with all other causes of hospitalizations to highlight demographic and environmental characteristics associated with hospitalizations due to HRIs. The study then examined outcomes among common comorbidities (diabetes, cardiac, respiratory and renal diseases) with and without HRI diagnoses to understand how HRIs may increase the risk of death, discharge status, hospital resource use and costs among these exacerbated medical conditions commonly associated with high ambient temperatures and extreme heat events. The study further focused on the direct costs associated with hospitalizations due to HRI and estimated future costs by examining climate models projecting an increase in ambient temperatures as well as an increase in the frequency and intensity of extreme heat events. The three aims of the study fit within the conceptual framework of a vulnerability assessment diagramed in figure 1.1 examining how exposure to heat events, sensitivity of the populations, outcomes and adaptive capacities are related in identifying risk factors and patterns for hospitalizations of heat-related illnesses. The framework exemplifies the connection of how heat events are associated with heat-related illnesses, but this study then

examines aspects of the framework, as highlighted in figures 2.1, 3.1 and 4.1, identifying individual and environmental characteristics and examining adaptive capacities that influence the potential outcomes of these hospitalizations. Additionally, by examining the costs associated with hospitalizations the study explored the adaptive capacities and responses that may affect these healthcare costs. In the following section, the main findings and interpretations are summarized.

5.2. Summary of the findings

5.2.1. Chapter 2

Analyses of hospitalizations due to heat-related illnesses in the United States, 2001-2010 highlighted a number of risk factors. It is important to distinguish between heat morbidity and heat mortality since risk factors can be significantly different. This study has found that individuals over 40 years old and males were more likely than females to be hospitalized for a HRI. Prior research in heat mortality had indicated that children and the elderly were most at risk. The current research shows that many age groups are at risk for heat-related illnesses and the perception of who is vulnerable may not be well understood by the general population. As global warming increases average ambient temperatures and extreme heat events become more common, populations that were previously thought to not be at risk for HRI may now be included as vulnerable groups.

Another important finding indicated that people in rural areas and small urban clusters were more likely to be hospitalized for HRIs compared to people in urban areas. The urban heat island effect has shown us that higher ambient temperatures are more likely to occur in urban centers due to heat-retaining properties of building and roads; thus, it is assumed that due to these higher

temperatures in urban areas there would be more heat morbidity and mortality. This finding requires additional research as the variables contained in the NIS cannot answer exactly why the risk of hospitalization for HRI is greater in rural and small urban clusters, but highlights the need to understand environmental factors such as geographic location and the built environment which may lead to an increased risk for HRIs. While these results are contrary the above mentioned concept the "urban heat island" differences in occupational exposures and air conditioning availability may reflect these differences though the lack of exposure data complicate the interpretation of these results.

Similar to heat mortality, the current research found that poor populations and those identified as Black, Hispanic, Asian/Pacific Islander and Native Americans were also at an increased risk of hospitalization due to HRIs. This compliments the spatial analysis conducted for air conditioner use, a significant protective factor against HRI, showing that as air conditioner use in the United States grew from 2005-2009, populations at greatest risk, elderly and low-income families had a decrease use of air conditioners. While air conditioner use may not be the best alternative due to its increased energy demand in summer months, it is an option public health officials must consider when trying to protect vulnerable populations from HRIs.

Overall identification of heat-related illnesses is important in understanding who is most at risk and informs our ability to target these populations for protective interventions. In this analysis a decreased risk of diagnosed common comorbidities with heat-related illnesses was contrary to previous research indicating that these common comorbidities are exacerbated during extreme heat events. This is interpreted cautiously as the severity of the underlying condition may have led providers to code these conditions and under-diagnose or under-code HRI. Underreporting of HRI has been noted in past studies as well as the current study and may indicate that greater

knowledge is required among health care professionals in recognizing and diagnosing heatrelated illnesses especially when common comorbidities are presented.[1,2]

5.2.2. Chapter 3

In addition to the risk factors for hospitalization of HRI, outcomes for these hospitalizations can also help us to better understand vulnerable populations to extreme heat events. As noted in Chapter 3, hospitalizations for heat-related illnesses also include common comorbidities such as diabetes, cardiac, renal and respiratory diseases. These underlying medical conditions may be exacerbated due to heat events and subsequent heat-illnesses triggering a hospitalization. The current research did not see any increased negative health outcomes (death or non-routine discharge) or increased hospital resource use (length of stay, number of procedures or total charges) among those hospitalized with a heat-related illness and those hospitalized with diabetes, cardiac or renal disease and a concurrent HRI diagnosis. Although those hospitalized with respiratory diseases and a HRI diagnosis did show increased number of procedures as well as increased risk of death and non-routine discharges compared to populations hospitalized with only a respiratory disease.

While multivariable adjusted regressions did not show increased risk of negative health outcomes or increased hospital resource use among those hospitalized for heat-related illness or diabetes, cardiac and renal diseases with a HRI, stratified analysis of sociodemographic and environmental characteristics showed an increase in negative outcomes among certain populations. By changing the population denominator, for example, examining males diagnosed with a respiratory disease compared that to males diagnosed with a respiratory disease and heatrelated illness, the analysis was able to isolate the population of males with a diagnosis of respiratory disease in examining how the effect of a diagnosed heat-related illness impacted

outcomes among that population. For heat-related illnesses alone, increase risk of death was seen among 18-64 year olds, the uninsured and those hospitalized in the Western United States.

Diagnoses of diabetes with a HRI showed increased number of procedures among infants and children as well as an increased risk of non-routine discharges identifying as Asian/Pacific Islander, Native American or Other.

Discharges with a co-diagnosis of a cardiac disease and a heat-related illness showed increased risk of death among many different groups. These include males, persons 18-74 years old, Blacks, Hispanics, hospitalizations in the lowest zip-code income quartile and those who were uninsured. Additionally, those hospitalizations in urban areas and those in the West were also at an increased risk of death from cardiac disease and a HRI diagnosis as compared to those with just a diagnosis of cardiac disease. Limited negative outcomes were seen in those diagnosed with renal diseases and a heat-related illness though increased risk of death was seen among females, infants and children (0-17 years old).

Similar to the multi-variable analysis of respiratory diseases with a HRI diagnosis, the stratified analyses showed a number of increased negative outcomes. Almost all sociodemographic and environmental characteristics showed increased risk of death and non-routine discharges, with infants and children (0-17 years old) having the highest risk (6.5 increased risk of death and 3.3 increased risk of non-routine discharge). Blacks and those aged 18-39 years old showed an increase in negative outcomes for each category analyzed while the uninsured showed significant results for increased negative outcomes in all but two categories (length of stay and total charges). These results give a clear indication that respiratory diseases with a heat-related illness diagnosis play a significant role in the outcomes for hospitalized individuals. Heat-related illnesses may exacerbate other common comorbidities and can significantly impair health

outcomes. The study results from Chapter 3 highlight increased negative outcomes for heatrelated illness in addition to the risk factors described in Chapter 2; combined these indicators

can help researchers better understand the HRI vulnerabilities among specific high risk populations.

5.2.3. Chapter 4

During the study period, 2001 to 2010, hospitalizations of heat-related illnesses increased at a higher rate than all other hospitalizations. Although comparatively costs for heat-related illness hospitalizations were lower than all hospitalizations during this time period, the average inflation-adjusted hospital stay cost in the United States has remained stable over the years, while costs for heat-related illnesses have increased as much as 18% in years corresponding with increased number of heat events.[3]

From 2001 to 2010 the average inflation-adjusted cost for a heat-related illness was $7,505 (all costs represent inflation-adjusted 2013 US Dollars) and total aggregate costs for all hospitalizations were $542.5 million. Aggregate costs of heat-related illness hospitalizations went from $41.5 million in 2001 to $81.5 million in 2010.

Studies using climatic models predict that there will be an increase in frequency and intensity of heat events corresponding to a 2-fold to 7-fold increase by mid-century, the estimates vary due to the modeling of low emission and high emission scenarios.[4,5] The predicted increases in extreme heat events were then used to estimate the potential for costs associated with heat-related illness hospitalizations by mid-century. A 7-fold increase in costs of hospitalizations for heat-related illness (based on 2013 inflation-adjusted costs from 2010 HRI hospitalizations) would be

approximately $570.5 million per year. These estimates indicate that over half a billion dollars per year would be needed to cover costs of heat-related illness hospitalizations by the mid-21st century. The estimates are conservative and represent the absolute minimum cost associated with hospitalizations of heat-related illnesses, due to the conclusions that HRIs themselves are largely underreported as indicated in Chapter 2.

Protective measures such as heat-health warning systems (HHWS) and air conditioning use were examined as cost-effective strategies in reducing heat-related illness hospitalizations. Studies show that HHWSs would cost considerably less to implement and run compared to the cost of individuals hospitalized for HRIs. While there is still some debate about the functionality of these systems, heat health warning systems may be a cost-effective measure to prevent heat-related illness.[6,7]

Additionally, air conditioning use in either residential homes or public cooling centers provides significant protection against HRIs.[8] Analysis of data from the Residential Energy Consumption Survey (2009) estimated that householders in the United States spent $196 annually to cool their homes. This cost is also significantly less than the average cost of a hospitalization due to HRI. While air conditioning may be a protective factor, the demand on energy infrastructure and emissions related to energy use for cooling may be contrary to the concepts of global warming and climate change. Alternative methods to reduce costs for HRI hospitalizations will need to be explored if we continue to see that climatic models and estimated costs increase significantly in the future.

5.3. Limitations

This study has several limitations other than the constraints of a cross-sectional analysis. First, the Nationwide Inpatient Sample (NIS) is an administrative database which limits analyses based on available variables in addition to not being as accurate as clinical data. Additionally ICD-9 codes are prone to coding error and reporting of some variables varies state by state, depending on the reporting requirements for that state.[9] The data in the NIS is based on coding by healthcare providers and confers the prevalence of heat-related illnesses based on their diagnostics criteria; research was not the intended use for this data. Because coding is to facilitate reimbursement and not for epidemiological studies this may introduce selection bias into coding within the heat-related illness spectrum towards that of the more severe cases such as heat stroke. Also, only variables that were included in the NIS dataset were used to control for confounding thus not accounting for variables such as air pollution, which may have an effect on hospitalizations of heat-related illnesses. Second, due to the nature of how data is collected by the NIS, date and time of hospitalization cannot be determined and thus, cannot be linked to a specific heat event. Because of this cases of heat-related illness hospitalizations include both classic non-exertional HRIs and exertional HRIs. This bias, however, may be counterbalanced by controlling for age as most exertional heat-illnesses are seen in healthy and young individuals active primarily outdoors during the summer months. Third, research involving administrative databases may be underreporting chronic comorbidities.[10] Underreporting of heat-related illnesses is also occurring due to underlying medical conditions such as cardiac and respiratory diseases being exacerbated during heat events which in turn may be diagnosed as the primary cause of hospitalization even if exposure to heat was the initial cause. Additionally, due to underreporting of heat-related illnesses, estimations of costs and future costs are conservative and represent the absolute minimum costs associated with hospitalizations of heat-related

illnesses. Fourth, data from the Residential Energy Consumption Survey were not linked to the NIS data due to the different levels of measurement (individual discharge record versus household) thus spatial analysis of air conditioning data can only be made at the ecological level, limiting generalizability due to the ecological fallacy.

5.4. Strengths and public health significance

There are a number of strengths in this study. First, by studying heat morbidity, this research adds significantly to the limited knowledge on heat-related illnesses and outcomes that do not relate specifically to heat mortality. By understanding that there are differences in risk factors and outcomes between heat morbidity and heat mortality public health officials can tailor interventions to a broad range of vulnerable populations. Second, using the NIS as a nationally representative sample of hospitalizations for heat-related illnesses and applying sample weights allows for the identification of risk factors and outcomes that are generalizable to a much larger population than the sample size. This contributes to the expanding descriptive data and general understanding of heat-related morbidity in a public health context. In particular, the use of hierarchical modeling in identifying risk factors through hospitalizations accounts for the interacting effects of patient and hospital characteristics. This information will improve the overall knowledge of public health researchers using vulnerability assessments in understanding both individual and environmental characteristics that influence risk factors for heat-related illnesses. Third, while regression analysis on all hospitalizations did not show increased negative outcomes, stratified analyses showed increased negative outcomes among specific groups hospitalized with a HRI and common comorbidity. Methodologically, the use of stratified analyses on outcomes of hospitalizations with a diagnosed HRI and common comorbidity provide a more in-depth view of vulnerable populations to HRIs. Since most pathways from climate change to health are complex, this research highlights potential exposure-response

associations in the causal paths which can inform future epidemiological models and studies to further analyze risk factors and outcomes associated with HRIs.[11] Lastly, analyzing costs of hospitalizations from HRIs and estimated future costs provide information on the economic outcomes climate change is has on health. Prior analyses have been limited to economic costs associated with emission though as climate change continues to impact health, costs associated with the disease burden will help garner funding for research to understand the links between climate change and adverse health effects as well as improve adaptation and resiliency strategies to protect vulnerable populations. The negative health effects associated with heat events can be reduced by adequately planned and funded public health responses, this research will assist in improving the cost-effective and cost benefit analyses needed by policymakers and stakeholders to sufficiently allocate resources.[12]

5.5. Policy recommendations and future research directions

This study provides important evidence on risk factors and outcomes associated with hospitalizations due to heat-related illnesses. In general, individuals hospitalized for heat-related illnesses had risk factors that include minorities and persons of lower socioeconomic status, males, most age groups, rural and small urban populations and diagnoses of common comorbidities such as diabetes, cardiac, renal and respiratory diseases. Outcomes of hospitalizations also indicated that as heat events increase the number and cost of hospitalizations will also increase. These study findings justify allocating more resources to target populations at risk for hospitalization due to heat-related illnesses. To achieve this, it will be important to clearly define heat waves, warnings and watches. Currently the National Weather Service (NWS) provides national general heat alert criteria and encourages local NWS Forecast Offices to develop local criteria in cooperation with local emergency and health

officials, and/or utilize detailed heat/health warning systems based on scientific research (JG Ferrell – NWS, personal communication, March 20, 2013). This allows for a wide variety of definitions by local areas which may not be consistent with current scientific research. Implementing more structured protocols for identifying a heat event allows national and local weather services to potentially alert vulnerable populations more rapidly and allows researchers to compare regions of similar climates to further understand heat morbidity and heat mortality patterns.

Along with definitions of heat waves and warnings, definitions of heat morbidity and heat mortality have been imprecise and underdiagnosed.[13] The most recent example of improvements to heat mortality definitions came after the 1995 heat wave in Chicago after many deceased were found at home.[14] As noted in this study, common comorbidities may take precedence over the diagnosis of heat-related illnesses, especially in cases of cardiac or respiratory distress. Educating healthcare professionals and improving the diagnostic procedures for identifying a heat-related illness will improve reporting and further our understanding of heat morbidity. Educating the public will also be an important step in reducing the number of hospitalizations of heat-related illnesses. While many individuals understand broad concepts concerning climate change, consequences of climate change in the general population are less well established.[15] Promoting policies of education and information when experiences of heat waves and heatrelated illnesses are more prevalent, right before summer and during the summer months may garner increased understanding of the impact of climate change on public health, particularly heat wave awareness and improved health outcomes and reduced hospitalizations of heat-related illnesses. The findings in this study indicate a large burden of heat-related illness on working-age populations may be related to occupational exposures. While the Occupational Safety and Health Administration (OSHA) does not have a regulation specifically for heat stress, they have

guidelines that address issues of environmental and occupational exposure to high heat for the workplace. Preventative measures should continue to target at risk workers.

These interventions and adaptations can be leveraged by already existing public health programs.[16] People with chronic medical conditions who regularly receive care can receive additional information about their risk for HRIs during doctor or hospital visits. Also programs that target lower socioeconomic populations can also be used to disseminate information about the risks associated with heat-related illnesses and protective factors such as using air conditioning or visiting a public cooling center. Financial constraints can limit the development and implementation of preventative measures for improving health outcomes associated with extreme heat events. Providing adequate funding in addition to designating project leaders and long term goals to improve heat health awareness will be needed at multiple levels of government and buy-in from stakeholders in the community. Establishing these systems can help plan for and maintain adequate heat-health prevention programs.

As highlighted in this study, the analysis of large administrative data can be useful in further identifying potential risk factors and vulnerabilities for heat-related illnesses. The use of epidemiological methods and data collection from a variety of sources can link known vulnerabilities and protective factors to individual health outcomes to obtain a better understanding of populations most effected by climate change.[11] The lack of high quality longterm data sets reduces our ability to respond effectively to public health emergencies. Improved data collection and analyses in this way will help researchers and public health officials collect relevant and useful information to target interventions towards these vulnerable populations and improve the adaptive capacity and response to extreme heat events.

In conclusion, the study revealed a number of risk factors and negative health outcomes associated with hospitalizations of heat-related illnesses. This study also highlights some of the

economic costs of climate change and provides information on the cost-effectiveness and costbenefit to implementing adaptive measures to prevent hospitalizations of HRIs. These findings provide additional scientific evidence that heat-related illnesses will continue to rise and will continue to be a public health burden as climate changes increase in frequency and intensity of extreme weather events. Along with educational interventions, efforts to understand patterns of hospitalizations of heat-related illnesses will be important to reduce the risk of adverse health conditions and negative health outcomes. This study calls for further research efforts that should focus on improving syndromic surveillance during heat events, clarifying appropriate heat health warning messages and providing stronger theoretical frameworks for projecting heat-related morbidity and mortality.

Appendix I. Demographic Characteristics: Heat-Related Illness (HRI), Diabetes, Cardiac disease Patients, with and w/o HRI diagnosis, 2001-2010 (Summer)

	HRI Hospitalization	Diabetes Hospitalization	HRI + Diabetes Hospitalization	Cardiac Disease Hospitalization	HRI + Cardiac Disease Hospitalization
N	14949	1271472	384	7375754	1819
Age, Mean (SD)	55 (21.8)	57(18.3)	58(18.2)	69(15.3)	69(16.7)
Age Categories 0-17	4.45%	2.57%	1.56%	0.55%	0.78%
18-39	20.54%	14.15%	16.67%	3.18%	4.71%
40-64	38.17%	45.15%	45.05%	30.15%	31.12%
65-74	13.41%	19.91%	15.53%	23.2%	19.74%
75+	23.43%	19.22%	21.1%	42.92%	43.66%
Gender					
Male	72.99%	47.18%	71.35%	50.78%	68.15%
Female	26.91%	52.82%	25.65%	49.22%	31.85%
Missing	0.19%	0	0	0	0
Race/Ethnicity					
White	54.93%	45.98%	46.99%	59.92%	60.46%
Black	13.92%	17.54%	17.31%	9.6%	11.19%
Hispanic	9.35%	11.75%	11.99%	5.81%	6.32%
Other	3.77%	4.46%	3.09%	3.4%	2.69%
Missing	18.02%	20.27%	20.62%	21.27%	19.34%
Median Income Quartile*					
0-25th percentile	29.92%	27.19%	32.98%	22.19%	27.51%
26th to 50th percentile	21.44%	20.92%	20.62%	21.01%	20.14%
51st to 75th percentile	15.59%	16.82%	13.16%	18.27%	15.34%
76th to 100th percentile	11.42%	12.22%	8.31%	15.36%	13%
Missing	21.63%	22.84%	24.93%	23.17%	24.01%

Payer – Primary, % Medicare	39.6%	46.03%	42.94%	66.14%	64.07%
Medicaid	9.14%	14.88%	7.83%	6.06%	5.2%
Private/HMO	27.79%	27.62%	31.38%	22.07%	20.99%
Self/Other	23.14%	11.30%	17.79%	5.61%	9.41%
Missing	0.33%	0.17%	0	0.12%	0.34%
Insured	76.52%	88.53%	82.21%	94.27%	90.25%
Uninsured	15.05%	7.94%	11.35%	3.54%	5.63%
Missing	8.43%	3.53%	6.45%	2.19%	4.12%
Admin Source					
ED	58.89%	48.68%	61.48%	46.54%	60.71%
Other Hosp/Facility	1.86%	3.05%	0.96%	5.92%	2.19%
Court/Law	0.05%	0.07%	0.80%	0.03%	0
Routine/Other	11.51%	27.34%	12.04%	26.65%	12.08%
Missing	27.7%	20.87%	24.72%	20.85%	25.02%
Admin Type					
Emergency	72.76%	55.27%	68.99%	54.32%	71.76%
Department					
Urgent	14.13%	16.33%	15.88%	18.19%	14.24%
Elective	5.23%	18.1%	5.91%	19.41%	5.54%
Trauma/Other	0.15%	0.13%	0	0.15%	0.17%
Missing	7.74%	10.17%	9.22%	7.93%	8.25%

*zip code of patient

Appendix II. Demographic Characteristics: Renal and Respiratory disease patients, with and w/o HRI diagnosis, 2001-2010 (Summer)

	Renal Disease Hospitalization	HRI + Renal Disease Hospitalization	Respiratory Disease Hospitalization	HRI + Respiratory Disease Hospitalization
N	1177189	2485	4776386	1430
Age, Mean (SD)	67(17.6)	48(18.9)	60(24.2)	60(20.3)
Age Categories 0-17	1.10%	1.70%	8.97%	3.28%
18-39	6.53%	35.13%	7.85%	11.82%
40-64	31.39%	43.64%	29.30%	39.19%
65-74	20.96%	8.20%	19.69%	17.74%
75+	40.02%	11.32%	34.19%	27.97%
Gender				
Male	51.94%	89.7%	47.1%	68.43%
Female	48.06%	10.3%	52.9%	31.57%
Missing	0	0	0	0
Race/Ethnicity				
White	52.3%	51.13%	57.42%	59.71%
Black	18.04%	18.99%	10.77%	12.25%
Hispanic	7.68%	13.38%	7.29%	7.13%
Other	4.01%	3.69%	3.55%	4.21%
Missing	17.96%	12.81%	20.97%	16.70%
Median Income Quartile*				
0-25th percentile	29.03%	34.08%	25.62%	31.49%

26th to 50th percentile	24.45%	25.54%	21.91%	21.61%
51st to 75th percentile	20.87%	17.90%	17.97%	15.12%
76th to 100th percentile	16.43%	12.33%	13.67%	10.97%
Missing	9.22%	10.15%	20.83%	20.82%
Payer – Primary, %				
Medicare	68.78%	23.15%	57.30%	51.35%
Medicaid	8.68%	8.17%	13.70%	11.82%
Private/HMO	16.64%	30.25%	21.84%	18.68%
Self/Other	5.76%	37.91%	7.01%	17.90%
Missing	0.13%	0.52%	0.14%	0.24%
Insured	94.10%	61.57%	92.84%	81.85%
Uninsured	3.68%	26.79%	4.51%	10.33%
Missing	2.22%	11.64%	2.65%	7.83%
Admin Source				
ED	34.69%	39.52%	49.91%	59.18%
Other Hosp/Facility	3.32%	1.42%	4.00%	1.98%
Court/Law	0.03%	0	0.04%	0
Routine/Other	14.88%	6.62%	22.29%	11.44%
Missing	47.08%	52.44%	23.76%	27.40%
Admin Type				
Emergency	65.33%	81.36%	60.29%	72.01%
Department				
Urgent	16.70%	11.86%	17.55%	12.66%
Elective	11.60%	3.47%	14.44%	5.72%
Trauma/Other	0.18%	0	0.29%	0.30%
Missing	6.20%	3.31%	7.43%	9.31%

*zip code of patient

Appendix III. Hospital Characteristics: Heat-Related Illness (HRI), Diabetes, Cardiac disease Patients, with and w/o HRI diagnosis, 2001-2010 (Summer)

	HRI Hospitalization	Diabetes Hospitalization	HRI + Diabetes Hospitalization	Cardiac Disease Hospitalization	HRI + Cardiac Disease Hospitalization
N	14949	1271472	384	7375754	1819
Hospital Region					
Northeast	11.61%	17.78%	10.44%	17.65%	12.43%
Mid-West	18.75%	18.97%	22.51%	20.52%	22.62%
South	54.43%	47.35%	53.38%	47.88%	49.80%
West	15.22%	15.90%	13.38%	13.96%	15.14%
Hospital Bed size					
Small	17.15%	12.69%	17.45%	11.07%	16.00%
Medium	26.59%	25.30%	30.21%	23.11%	26.94%
Large	55.77%	61.71%	52.08%	65.54%	56.73%
Missing	0.48%	0.30%	0.26%	0.29%	0.33%
Hospital Location					
Rural	3.81%	2.40%	3.13%	2.37%	3.90%
Small Urban	10.76%	6.91%	13.02%	6.44%	10.67%
Cluster					
Urban Area	48.72%	62.86%	43.75%	64.93%	50.47%
Missing	37.01%	27.83%	40.10%	26.26%	34.96%

Appendix IV. Hospital Characteristics: Heat-Related Illness (HRI), Renal, and Respiratory disease Patients, with and w/o HRI diagnosis, 2001-2010 (Summer)

	Renal Disease Hospitalization	HRI + Renal Disease Hospitalization	Respiratory Disease Hospitalization	HRI + Respiratory Disease Hospitalization
N	1177189	2485	4776386	1430
Hospital Region				
Northeast	17.71%	7.58%	16.88%	13.71%
Mid-West	20.23%	14.52%	19.93%	18.29%
South	48.72%	65.15%	49.60%	48.58%
West	13.35%	12.75%	13.59%	19.43%
Hospital Bed size				
Small	10.53%	14.25%	13.65%	16.71%
Medium	22.42%	25.67%	25.00%	25.80%
Large	66.40%	59.15%	61.04%	56.78%
Missing	0.65%	0.93%	0.31%	0.70%
Hospital Location				
Rural	1.91%	1.89%	2.96%	3.29%
Small Urban	5.06%	7.08%	8.22%	10.56%
Cluster				
Urban Area	64.69%	48.29%	62.06%	53.85%

Missing	28.34%	42.74%	26.75%	32.31%

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The revolving door pattern of jail incarceration and homelessness and its influence on mortality and morbidity among New York City adults

A dissertation submitted to the Graduate Faculty in Public Health in partial fulfillment of the requirements for the degree of Doctor of Public Health, The City University of New York

2014

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This manuscript has been read and accepted for the Graduate Faculty in Public Health in satisfaction of the dissertation requirement for the degree of Doctor of Public Health.

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THE CITY UNIVERSITY OF NEW YORK

Abstract

The revolving door pattern of jail incarceration and homelessness and its influence on mortality and morbidity among New York City adults

by

Adviser: Professor Lorna E. Thorpe

Objectives

The purpose of this dissertation study was to identify timing and sequencing of jail incarceration and homelessness by utilizing sequence analysis and to test whether a particular trajectory contributes to mortality risk and discontinuity of HIV care.

Methods

The main data source was an existing matched dataset, constructed using administrative data from the New York City (NYC) Departments of Health and Mental Hygiene, Correction, and Homeless Services. The study cohort consisted of 15,620 NYC adults with recent histories of both jail incarceration and homelessness. Monthly experiences of jail incarceration, homelessness, and community-dwelling in 2001-03 were summarized into trajectory groups using sequence analysis. Then, the study examined associations between trajectory groups and all-cause, drug-related, and HIV mortality risk during the subsequent two years using Standardized Mortality Ratio (SMR) and marginal structural modeling. The study further focused on the sub-set of the cohort living with HIV/AIDS, and tested whether trajectory groups were associated with retention in HIV care and viral suppression.

Results

Sequence analysis identified six trajectory groups of incarceration/homelessness. A majority of the study cohort had sporadic experiences of brief incarceration and shelter stays (**Temporary** pattern), whereas the others had mixed experiences in various lengths and frequencies. The SMR analysis found that all-cause, drug-related, and HIV mortality risk among individuals with the **Temporary** pattern was significantly higher than that of non-incarcerated/non-sheltered NYC adults of the same age, sex, race/ethnicity, and neighborhood poverty. Similarly, after accounting for confounding in marginal structural modeling, the elevated mortality risk was associated with the **Temporary** versus persistent shelter stay patterns (**Continuously homeless** pattern). Of 1,173 individuals living with HIV/AIDS, the **Temporary** pattern was independent of retention in HIV care, but significantly associated with lower prevalence of viral suppression, compared with a pattern of prolonged shelter-free and jail-free period (**Decreasingly homeless** pattern).

Conclusions

Sporadic experiences of brief jail incarceration and homelessness among NYC incarcerated/sheltered adults were associated with excess risk of mortality and low prevalence of viral suppression. The study highlights the importance of public health efforts to modify patterns of incarceration/homelessness experiences, along with behavioral interventions, in order to reduce risk of adverse health conditions.

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Chapter 1. Introduction

1.1. The revolving door problem in public health

Jail incarceration and homelessness are strongly correlated in the United States (US), and about 25,000 adults in New York City (NYC) had histories of both events between 2001 and 2005.[1] Homeless individuals may be at high risk of incarceration, as their behaviors related to survival or substance use in public are often criminalized.[2,3] The reverse pathway also is likely. Those released from prison or jail, as opposed to the general population, are more likely to become homeless, as they encounter limited opportunities for employment and housing, and experience social stigma in the community.[4,5] This frequent transition between jail incarceration and homelessness is one particular case of the revolving door phenomenon, which refers to a cyclical pattern of institutional recidivism such as repeated admission to jails, prisons, homeless shelters, and psychiatric hospitals.[6] This revolving door problem of incarceration and homelessness is considered a serious public policy failure and human rights crisis, draining public resources while letting a particular group of people cycle through shelters and correctional facilities. It also has serious public health ramifications. A limited body of studies has shown that people with histories of both incarceration and homelessness are at greater risk of morbidity and mortality compared with those experiencing only one event.[1,7] For example, a recent NYC longitudinal study found that formerly-incarcerated people with histories of homelessness were more likely to die from drug-related causes and suicide than formerly-incarcerated people who did not have histories of homelessness.[1] This excess risk of mortality and morbidity may be the result of particular recent or longstanding behaviors such as criminal histories or substance use, lifecourse

exposures related to poverty, severe mental illness, or circumstances such as unemployment.[8] Alternatively, the excess health burden potentially reflects the cumulative or incremental effects from transitions in and out of these institutions and states of being, affecting stress and potentially introducing barriers to stable health care. Both perspectives may be equally important in understanding potential causal mechanism by which homelessness and incarceration could influence health conditions.

Despite the institutional similarities between sheltered homelessness and incarceration (e.g., residential facilities operated by public agencies), the often cyclical nature of exposure, and the sizable overlap between the two populations, researchers typically consider each event separately, resulting in two separate bodies of literature. This may be because the former is influenced by housing status and policies, whereas the latter is based on a determination that a criminal justice law has been infringed upon. In order to describe the background of the revolving door phenomenon of incarceration and homelessness ("the revolving door problem") in a public health context, the dissertation first reviews existing evidence on the separate linkages between homelessness and health and incarceration and health. It then summarizes common empirical and theoretical grounds for these associations.

1.2. Homelessness and health

Homelessness refers to a condition where individuals or families do not have a fixed and regular nighttime residence.[9] It is considered as an extreme case of housing instability, and about 26 million adults in the US (14% of the US adult population) have reported at least one homeless experience.[10] It is well established in the current literature that poor health conditions are associated with homelessness. About 39% of homeless adults in the US have been found to have

current mental illness, which is higher than the national estimate of 25% of adults.[11,12] In particular, about 50% of a national sample of US homeless adults reported current drug and alcohol problems.[11] Homeless adults also disproportionately suffer from both chronic and infectious diseases. For example, one study identified the prevalence of diabetes and hypertension among 351 NYC homeless adults with an average age of 35 years to be 6.3% and 17.1%, respectively, which was higher than the corresponding prevalence in US adults aged 3544 years (1.9% and 7.4%, respectively).[13] A recent meta-analysis of 43 studies from various countries indicated that the prevalence of tuberculosis (TB) disease and hepatitis C virus infection is also higher among homeless people compared with the general population.[14]

Consistent with poor mental and physical health conditions, excess mortality risk is evident among homeless adults. In a NYC retrospective cohort study, being in a shelter for at least one night was associated with an elevated risk of drug-related death and suicide.[15] Similarly, the race-adjusted mortality due to drug overdose was almost 16 times higher among homeless men aged 25-44 years in Boston, compared with the general population in Massachusetts.[16] In a United Kingdom study of two retrospective cohorts, homelessness was an independent risk factor for mortality even after controlling for demographic characteristics and clinical conditions.[17]

Along with adverse health conditions, homeless adults disproportionately suffer from limited health care access. A US national cross-sectional study of homeless adults found that almost two thirds reported unmet needs in medical, mental, or dental care in the past year.[18] Their rates of unmet need in specific areas of health care were six to 10 times higher than those in the US population overall.[18] Among adults living with HIV/AIDS, homelessness is associated with a low likelihood of continuity of HIV care (e.g., making at least one visit to primary care doctors

every six months) and initiation of and adherence to antiretroviral regimens.[19,20]

1.3. Incarceration and health

The US criminal justice system operates prisons and jails as places of imprisonment.[21] Prison is run by federal or state governments, and detains convicted individuals who are sentenced for more than one year. Jail is a local government institution that holds individuals charged with less serious crimes and sentenced for a shorter time period than prisoners (maximum one year). Those waiting for trials or who have violated probation and parole may also be detained in jail. In 2011, the point-in-time estimate of adults in the US prisons and jails was 1.6 million, while the total number of adults released from correctional facilities was estimated to be 10 million over one-year period.[22] Similar to homelessness, experiences of incarceration are associated with poor health conditions. Approximately 45% of federal prisoners and 56% of state prisoners in the US have mental illness, which is higher than the national prevalence (25%).[11,23] Consistent with high burden of mental illness, more than 70% of US incarcerated adults have histories of substance use.[4] A study conducted in 2004 found the age-adjusted prevalence of HIV was almost two times higher among a representative sample of US prisoners as opposed to the general noninstitutionalized US population[24] and even greater disparities were found in the prevalence of hepatitis C virus (17-25% vs. 2%) and TB (1% vs. 0.01%).[25] Increased odds of chronic diseases including hypertension, asthma, arthritis, and cancer are also associated with being incarcerated in US prison or jail after adjusting for demographics and alcohol use.[26]

During incarceration, inmates may receive some health care services and screenings (e.g., active screening for sexually transmitted diseases, TB, HIV, and hepatitis C) that are potentially more extensive than what they had access to in the community.[21] Several studies have shown that

among US and Canadian prisoners living with HIV/AIDS who disclose their HIV status, essential antiretroviral treatment and care are initiated in the early incarceration and well maintained until release.[27,28] Yet, screening for diseases and improved HIV care during incarceration may not necessarily mean that inmates generally receive adequate health care in prison or jail. According to the 2004 US national cross-sectional prison and 2002 jail surveys, about 30% (prisoners) and 42% (jail inmates) on prescription medications prior to incarceration reported discontinuing them after being admitted to prison or jail.[24] In addition, some benefits from improved access to care are no longer observed upon release from correctional facilities, as evidenced as a decreased level of antiretroviral treatment adherence or increased viral loads post release.[28,29] It may reflect limited health care access that this population chronically experiences prior to incarceration or life challenges that former inmates encounter in the community such as few opportunities for stable housing and employment. Similar to access to care, all-cause mortality while incarcerated is lower than that among the general population (e.g., Standardized Mortality Ratio = 0.62-0.85),[30,31] but this protective effect of incarceration tends to disappear after release from prison or jail. A recent meta-analysis shows that excess all-cause mortality risk after prison release was consistently observed across seven different prison populations.[32] In particular, Binswanger and colleagues found that the excess mortality risk was the highest during the first two weeks after release among former prisoners in Washington State.[33] They pointed out that the elevated risk of drug-related mortality, cardiovascular disease mortality, suicide, and homicide during the first two weeks post-release were the largest contributors to the excess mortality risk.

1.4. Common explanations about health and homelessness/incarceration

In current research, there are two major hypothesized mechanisms that explain excess risk of morbidity and mortality among homeless or incarcerated adults: an individual risk factor approach and a structural exposure approach. These approaches (described below) provide a common ground for synthesizing separate bodies of the current literature to understand and test risks associated with excess health burden among individuals with both experiences.

1.4.1. Individual risk factor approach. This approach considers homelessness or incarceration as a marker of particular demographic and behavioral characteristics.[34] It postulates that adverse health conditions associated with homelessness or incarceration are due to a high concentration of people with underlying health conditions, limited access to care, or risky behaviors such as active substance use and high-risk sexual behaviors prior to these events.[21] Given substantial overlap in characteristics between the incarcerated and homeless populations, including low socioeconomic status and substance use behaviors, the greater excess health burden among those with both experiences as opposed to those with only one experience or the general population may be a manifestation of a poorer underlying health status rather than a direct causal influence of the incarceration or shelter experience itself. The underlying assumption of this approach is that individual characteristics, risk behaviors, or network factors act as a common set of causes of adverse health conditions and homelessness/incarceration.[34] For example, in the crosssectional study of the convenience sample of homeless adults in San Francisco, the excess rate of HIV infection associated with histories of incarceration was interpreted as an indication of the particular social or personal network factor such as the number of sex partners and substance use that were positively associated with incarceration experiences as well as a risk factor of HIV infection.[7] In the individual risk factor approach, the elevated risk of HIV infection among

homeless adults with incarceration experiences, as opposed to those with homelessness only, was attributed to higher prevalence of risky sexual behaviors and substance use, rather than exposure to incarceration.[7] On the other hand, as an explanation of a protective effect of incarceration on all-cause mortality, incarceration has been considered to be a marker of protective factors based on the assumption that one needs to be physically healthy enough to commit crimes.[35]

1.4.2. Structural exposure approach. In this approach, homelessness and incarceration are considered as a process that damages biological systems and limits stable access to healthpromoting/protecting resources. Unlike the first approach that focuses on a role of demographic and behavioral characteristics or underlying health conditions, it emphasizes describing mechanisms by which the experiences of homelessness and incarceration cumulatively influence health via physiological processes or limited access to care.[34] As seen in recent evidence on the independent effects of homelessness/incarceration on adverse health conditions, this approach points to unique risks beyond demographic and behavioral risk factors such as persistent stress that lead to physical and mental impairment and social/administrative barriers that lead to social disadvantages.[17,36] This perspective has been conceptualized as being composed of three aspects: a psychological process, a physical process, and the influence of health care access.[37] For the psychological aspect it postulates that a lack of a permanent nighttime place or experiencing physical confinement requires a radical adjustment of behaviors that substantially increases stress, which in turn prevents optimal physiological functioning as evidenced in the association between an increased allostatic load due to persistent stress and excess risk of mortality and morbidity.[36,38-40] When it comes to the transition from correctional facilities to communities, the structural exposure approach hypothesizes that former inmates are stigmatized and stressed as

society typically discriminates against these people in economic and social activities.[36,41] Supporting this hypothesis, incarceration has been associated with a high likelihood of psychological stress as well as stress-related diseases.[36] In terms of the physical aspect, homelessness and incarceration are hypothesized to have a negative impact on health via radical changes in living conditions or increased exposure to violence and environmental hazards.[17,36] Evidence also shows that incarceration could decrease drug tolerance levels due to temporary abstinence of drugs during incarceration, increasing the chance of a drug overdose among recently-released prisoners or jail inmates.[1,42] A contrasting view, however, highlights a decreased exposure to physical harm (e.g., traffic accidents, drug overdose) during incarceration, proposing that incarceration has a protective effect on health. This perspective has been supported by studies that reported lower risks of all-cause death during incarceration compared with the general population, mainly driven by lower risk of death due to external causes.[30,31]

In addition to the biologic explanation, homelessness and incarceration are barriers to essential health resources. Homeless people may consider primary care less important than urgent needs for survival (e.g., access to housing, personal hygiene, and food), which leads to disrupted disease management (e.g., HIV and diabetes) and prevention.[12,18] Additionally, distrust in public health systems, social isolation, and discrimination can create non-financial barriers to medical care.[12,18] For incarcerated individuals, there are two conflicting perspectives about the possible association between incarceration and access to care. One posits that incarceration could potentially exert positive health effects because the correctional system can provide essential health care for people with limited access prior to incarceration.[39] In particular, a highly controlled environment in correctional facilities has been considered as an ideal setting to

effectively administer long-term treatments such as antiretroviral treatment to HIV-infected prisoners who disclose their HIV status.[28] A contrasting view interprets a lower mortality risk during incarceration as an artifact that prisoners are protected from violence, drug overdose, or traffic accidents, rather than being due to improved health care access.[30] About 25% of prisoners using prescription drugs prior to incarceration reported that medications were discontinued after prison entry in the 2004 US national survey,[24] providing some evidence against the former perspective. Furthermore, a study from Georgia demonstrates that the protective effect of incarceration on mortality disappeared when compassionate release was accounted for, which represented 27% to 45% deaths among Georgia prisoners in 1991-2006, implying that release of sick prisoners is a probable cause of the decreased mortality rates among people at correctional facilities.[30]

1.5. Summary and gaps in the current literature

As described in the earlier section, a heavier burden of poor health is evident among adults with histories of homelessness or incarceration compared with non-homeless or non-incarcerated counterparts. Two main approaches show that health status associated with homelessness/incarceration can be explained by individual risk factors or cumulative exposure to these events. As illustrated in Figure 1.1, in the individual risk factor approach, excess health burden is a manifestation of a poorer underlying health status and risk behaviors, which are commonly found among people with these experiences. In the structural exposure approach, more emphasis is made on describing mechanisms whereby the cumulative experiences of homelessness and incarceration influence health via psychological, physiological, or health care access process.[34]

Each approach may be equally important in understanding potential causal relationships between homelessness/incarceration and health burdens, as both baseline characteristics and cumulative life challenges likely contribute to adverse health conditions. However, evidence for the second approach is scant in the current literature. A limited body of studies report mixed results when temporal aspects of incarceration or homelessness experiences are accounted for.[15,26,30] For example, protective effects on all-cause mortality among prisoners or jail inmates have been observed during incarceration,[30,31] which disappear immediately after release.[32] Also, chronic homelessness has been associated with high mortality rates and low HIV prevalence.[15] Prior risk profiles or static measures of incarceration/homelessness experiences, which are considered as determinants of poor health outcomes in most studies, may not be able to explain these timevarying associations. Another limitation is that most findings are based on cross-sectional snapshots and there is little evidence of a temporal relationship between exposure and health outcome. Except for mortality, health conditions have been rarely assessed as incident risk, and temporal descriptions of life challenges associated with homelessness and incarceration are quite limited. Longitudinal data may provide critical information to explain the association between health and homelessness/incarceration, as seen in a limited body of studies.[5] For example, using a convenience sample of recently released NYC jail inmates, Freudenberg and colleagues described the detrimental effects of incarceration on social integration. They found that a great majority had difficulty enrolling in some government services/benefits (e.g., housing programs, Medicaid) that were restricted to former inmates, and got involved with illegal activities again. Lastly, temporal dynamics between homelessness and incarceration are rarely examined in analyzing relationship between these experiences and health even though these two events are strongly correlated.[43] Instead, existing studies often emphasize temporal characteristics of one of

these experiences, while using the other as a static measure that describes past experiences or study settings.[7]

1.6. Overview of the dissertation

1.6.1. Overall goals

To address limitations in the existing literature, this dissertation aims to capture timing and sequencing of jail incarceration and homelessness and identify group-based trajectories (i.e., a statistical method for grouping individuals based on similar trajectories) among a retrospective cohort study of NYC adults who were incarcerated or sheltered in NYC from 2001-05. The first three-year administrative records of jail incarceration and homeless shelter use are used to create a measure of complex trajectories of these longitudinal events. Another aim of the dissertation is to examine the association between trajectories of jail incarceration/homelessness and health outcomes during the last two years to test whether longitudinal exposure to these events contributes to risk of mortality and morbidity. It first makes a population-level inference by comparing the study population with non-incarcerated and non-sheltered NYC residents. Then, focusing on NYC adults with both jail incarceration and homelessness, it attempts to draw causal inference from associations between the revolving door pattern and mortality/HIV continuum care outcomes (e.g., retention in HIV care and viral suppression from laboratory-based surveillance data).

1.6.2. Specific aims Specific

aims are:

Aim 1: To identify and characterize distinct groups of individual-level trajectories of jail incarceration and homelessness among NYC adults. Trajectories of homelessness and

incarceration are hypothesized to be defined as discrete groups of individuals who share timing and sequencing of these events rather than drawn from a continuous distribution that predicts future events such as life course development of body mass index and psychological attributes. This inference is plausible because being homeless or incarcerated is a major life disruption, and the laws and policies usually focus on unique groups of homeless (e.g., chronic and episodic homelessness) and incarcerated adults (e.g., misdemeanors, felons).

Hypothesis 1a: There are distinct groups of individuals that are characterized by withingroup similarities and between-group differences in trajectories of jail incarceration and homelessness.

- Demographic and behavioral characteristics associated with adverse health conditions are more commonly found among people with both jail incarceration and homelessness compared with those with only jail incarceration or only homelessness.

Hypothesis 1b: A particular trajectory of jail incarceration/homelessness is associated with sociodemographic and criminal characteristics, and also with prior health status.

A trajectory of consistent jail incarceration and homelessness will be positively associated with being a minority male and charged with minor crimes such as loitering and making unreasonable noise.

- A trajectory of frequent transitions between short-term jail incarceration and homelessness will be positively associated with prior mental illness and substance abuse.

Aim 2: To test whether particular trajectories of jail incarceration/homelessness are associated with excess risk of mortality. Frequent transitions between jail incarceration and

homelessness are hypothesized to be independently associated with mortality outcomes including excess risk of all-cause, drug-related, and HIV/AIDS deaths.

Hypothesis 2a: Among the NYC adult population, exposure to incarceration or homelessness is associated with risk of mortality.

- A trajectory of frequent transitions between short-term jail incarceration and homelessness is associated with the highest risk of mortality across all trajectories.

Hypothesis 2b: Among NYC adult population with both jail incarceration and homelessness, risk of all-cause, drug-related, and HIV/AIDS deaths is higher among individuals with frequent transitions of short-term jail incarceration and homelessness compared with those with trajectories of more persistent jail incarceration and homelessness after controlling for individual-level risk factors.

Aim 3: To test whether particular trajectories of jail incarceration/homelessness are associated with discontinuity of HIV care. Frequent transitions between jail incarceration and homelessness are hypothesized to be independently associated with lower likelihood of retention in HIV care (at least two test results that are three months or greater apart within one-year period) and lower prevalence of viral suppression (<400 copies/ml).

Hypothesis 3: Among NYC adults living with HIV/AIDS with recent experiences of both jail incarceration and homelessness, lower likelihood of retention in HIV care and viral suppression will be associated with frequent transitions of short-term jail incarceration and homelessness versus trajectories of more persistent jail incarceration and homelessness.

1.6.3. Organization of the dissertation

The subsequent part of the dissertation consists of four chapters. Chapter 2 introduces concepts and analytic approaches of group-based trajectory modeling method, and presents trajectories of jail incarceration and homelessness (aim 1). It also describes baseline demographic and criminal characteristics and prior mental illness/substance uses in each trajectory group. In Chapter 3, the trajectory grouping from Chapter 2 is used as an exposure variable and associated with all-cause, drug-related, and HIV mortality outcomes (aim 2). Risk of death is compared between the study population and non-incarcerated/non-sheltered NYC residents via standardized mortality ratios (SMRs). Along with the between-population comparison, the association between risk of death and a particular trajectory among the study population will be examined via marginal structural modeling. Chapter 4 focuses on incarcerated/sheltered adults living with HIV/AIDS in NYC and examines whether trajectory groups of jail incarceration and homelessness is associated with discontinuity of HIV care (aim 3). Chapter 5 summarizes findings from Chapters 2-4 and discusses strength and limitations of the study. The dissertation concludes with policy implications and future research directions.

1.6.4. Significance of the dissertation

Trajectories of jail incarceration/homelessness measured in the dissertation expand current knowledge on the 'revolving door' problem. To our knowledge, no other study has undertaken a characterization of such trajectories to date. As temporal information such as timing and order of events is usually accurately captured in routine administrative data sources, and as the science of matching large datasets improves, measures of this type will allow for more opportunities to explicate connections between theories and operationalization, which strengthens internal validity and leads to more effective and practical solutions.[44] In addition, using the matched jail and shelter records over time, this dissertation yields more complete profiles of demographic,

behavioral, and criminal characteristics for adults cycling through jails and homeless shelters, compared with previous cross-sectional studies. Lastly, adopting rigorous methods to strengthen causal inference from registry data, it improves the limited body of empirical evidence on the extent to which individual risk factors and structural exposure contribute to adverse health conditions. Findings will benefit public health practitioners to design and implement more effective public health interventions, as limited resources can be more efficiently directed to population groups or time periods of particularly high health risk (e.g., two weeks after release among former substance users).

1.7. Data sources and study population

The main data source that gives rise to the study cohort of adults incarcerated/sheltered in NYC between 2001 and 2003 is an existing matched dataset, constructed using data from the NYC Department of Health and Mental Hygiene (DOHMH), NYC Department of Correction (DOC), and NYC Department of Homeless Services (DHS). This probabilistic matching process has been evaluated and validation results have been published.[1] The DOC registry of NYC jail admission records serves as the primary data source that generates the study subjects aged 16 years or older who have been incarcerated in NYC jails (Rikers Island and borough houses of detention in Brooklyn, Manhattan, and Bronx) during 2001 through 2005. These individuals have been probabilistically matched with the DHS single adult shelter registry and multiple DOHMH registries (vital statistics, HIV) that record NYC shelter use events, death events, and all HIV diagnosed prevalent cases between 2001 and 2005. The final matched data include demographic and criminal charge information, NYC jail admission/discharge information, NYC single homeless shelter use, death, HIV diagnoses, and HIV laboratory test results for NYC adults who have been incarcerated during 2001-05. In this dissertation, a homeless shelter use event is

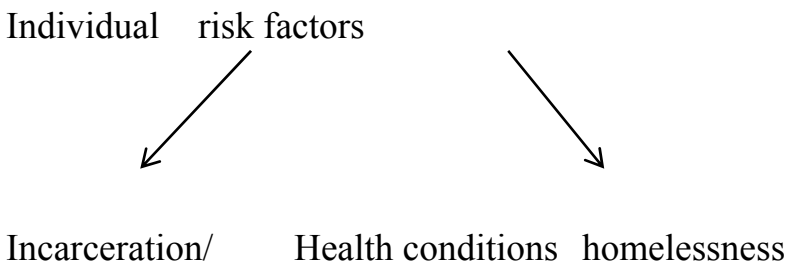
considered as a surrogate of homelessness given that 90% of NYC homeless adults are reported to use municipal homeless shelters.[45]

Among 298,281 ever-incarcerated or sheltered individuals in the matched data, the dissertation focuses on those who were incarcerated or sheltered from 2001-03 because the first three years were used to construct trajectories of jail incarceration/homelessness. Those who died during 2001-03 (N=1,231) were excluded because one of the main study outcomes was mortality during 2004-05. The data were further restricted to those aged to 18 years or older in 2001 because the youngest age of NYC single adult shelter entry is 18 years old (N=194,536). Of these, individuals with both jail incarceration and homelessness (N=15,620) served as the primary study cohort, while incarceration-only (N=144,566) and homelessness-only populations (N=34,350) were included as comparison groups (Figure 1.2). Even though the revolving door phenomenon of incarceration and homelessness did not occur in the last two populations, their data were included to enhance the understanding of characteristics and trajectories of incarceration/homelessness in the study cohort. In addition, by comparing the primary study cohort with incarceration-only or homelessness-only populations, a dose-response relationship can be examined. The first three years of jail incarceration and homelessness data were used to construct trajectories of these events. As suggested in the previous study of NYC homeless population, three years would be a sufficient time to identify stable patterns.[46] The remaining two years in the study period were used to assess the risk of mortality and morbidity by trajectory group. Then mortality rates among the study cohort and incarceration-only and homelessnessonly populations were compared with those among non-incarcerated/non-sheltered NYC adults. Because individual-level data were not available for NYC adults with no history of incarceration/homelessness,

aggregate counts of mortality (numerator) and NYC population counts (denominator) were obtained from the NYC Office of Vital Statistics and the US Census 2000, respectively, to estimate risk of mortality in this unexposed group.

Figure 1.1. Directed Acyclic Graphs for individual risk factor and structural exposure approaches

a. Individual risk factor approach



b. Structural exposure approach

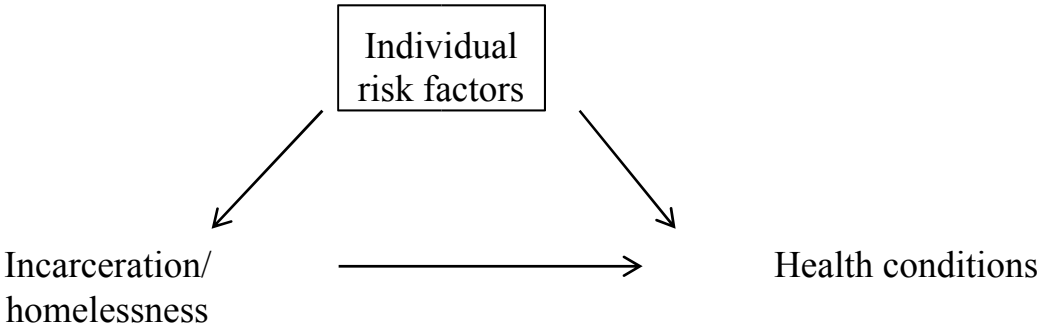
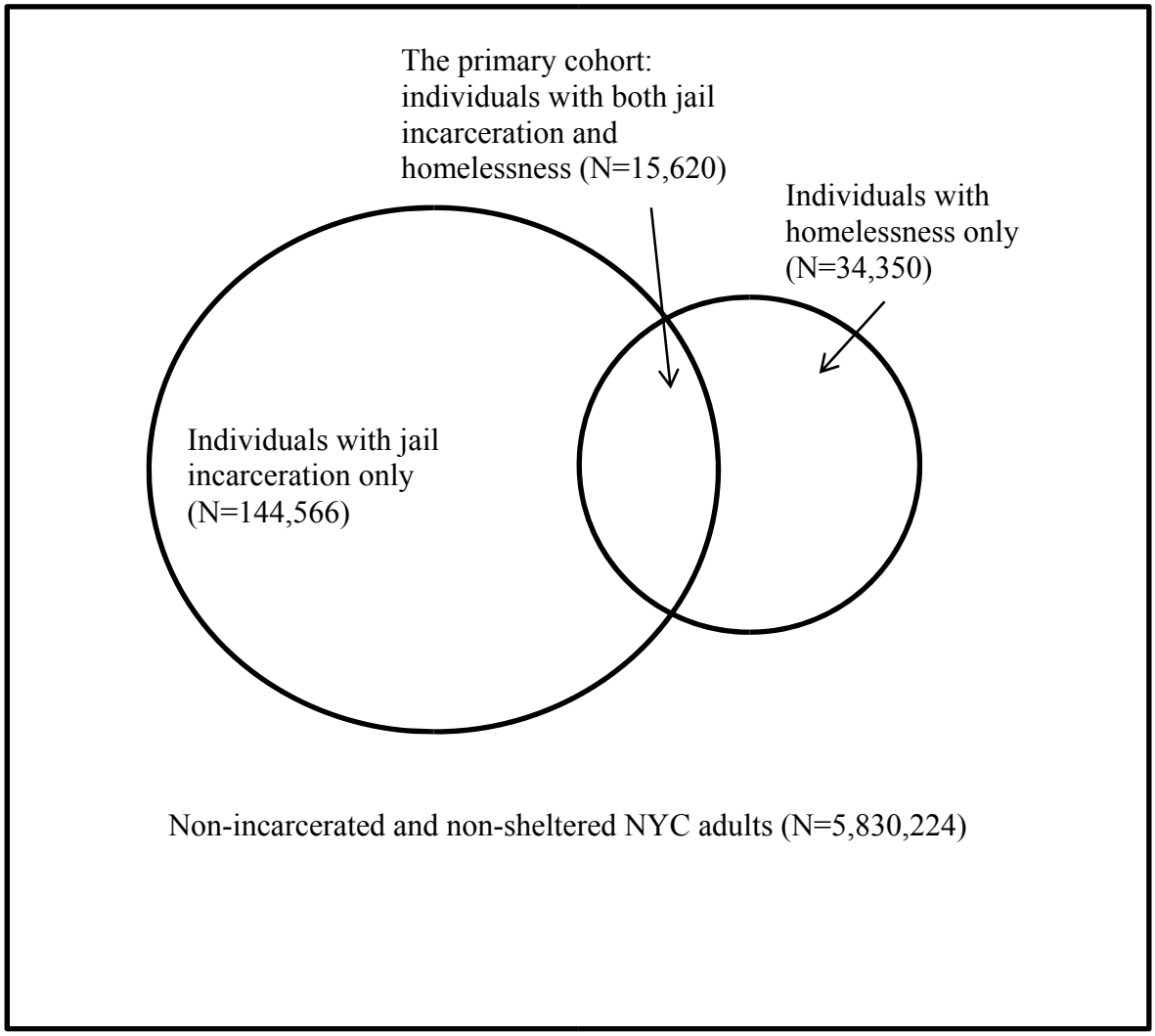


Figure 1.2. Venn diagram of the study population for the dissertation



Chapter 2. Group-based trajectories of jail incarceration and homelessness among New York City adults who were incarcerated or sheltered in 2001-03

2.1. Introduction

Experiencing both jail incarceration and homelessness has been associated with excess mortality and morbidity risk in the US. Recent evidence points to unique health risk attributed to cumulative exposure to these experiences beyond individual-level risk factors. Understanding this structural exposure perspective is important because the identification of differential health risks by specific time points or temporal patterns provide important insight into potential mechanism through which body systems are affected by the experiences of being homeless or incarcerated.[1-3] In addition, the improved knowledge will make public health interventions more

effective because public health resources can be more efficiently directed to particular population groups or time periods associated with excess health risk.

Despite these potential benefits from employing the structural exposure perspective, little has been researched on transitions from/to jail incarceration and homelessness over time and their influence on morbidity and mortality, reflecting challenges of quantifying complexity and heterogeneity of exposure trajectories. A usual statistical treatment of repeated outcome data may not be appropriate because its main focus is how to make correct estimates from correlated data, rather than measure heterogeneity of trajectories of events.[4] Recently progress has been made in the methodology, known as group-based trajectory modeling, for capturing concepts of sequence, duration, and timing to explain social phenomena such as employment and criminal behaviors.[5] The purpose of this study was to identify and characterize distinct groups of trajectories of jail incarceration and homelessness among NYC adults via group-based trajectory modeling. Specifically, adults who experienced both incarceration and homelessness relative to those with only a single exposure were profiled in terms of baseline characteristics and trajectories of incarceration/homelessness. Then, whether a particular trajectory was associated with socio-demographic and criminal charge information, and also with prior health status was tested.

2.2. Methods

2.2.1. Samples

The primary study cohort consisted of 15,620 adults who were incarcerated and sheltered in NYC in 2001-03. As described in Chapter 1, data sources were combined administrative data from

NYC DOC jail admission and NYC DHS single adult shelter registries. The comparison groups included 34,350 adults with only homelessness, and 144,566 adults with only jail incarceration.

2.2.2. Study variables

The outcome variable was trajectory groups of jail incarceration/homelessness. This variable was obtained via group-based trajectory modeling based on admission and discharge information from both NYC jail and DHS single shelter registries during 2001 through 2003. First, these temporal records were first divided into time periods of 30 days ("windows"). Since the data covered a three-year period, each individual had 36 windows. Then, one of three events (incarceration, homelessness, community-dwelling) was identified in each window, which yielded a sequence of three possible status descriptors assigned to each individual. For example, if incarceration event(s) occurred during the 30-day period, that month was marked as incarceration. The same logic applied to homelessness events. Lastly, if no incarceration or shelter stays occurred, that month was marked as community-dwelling. Three-quarters (76%) of discharge locations at the end of all incarceration events during 2001-03 were recorded as community as opposed to other places such as state prisons (16%), state psychiatric hospitals (0.5%), and deportations (0.6%).

Independent variables included demographic and behavioral characteristics and types of criminal charges from DOC admission records for the incarcerated population. Specifically, demographic characteristics included age on June 30, 2002 (grouped as 18-24, 25-34, 35-44, 45-54, and 55-89 years), sex, race/ethnicity (grouped as Non-Hispanic white, non-Hispanic black, Hispanic, nonHispanic Asian, and other), and nativity (grouped as US-born and foreign-born). For neighborhood characteristics self-reported zip codes were matched to one of 42 NYC

neighborhoods using the United Hospital Fund's designation, an aggregate of adjoining zip codes, and categorized into low (< 10%), medium (10 to 20%), high (20 to 30%), and very high poverty neighborhoods (30% or higher) based on the percent of residents living below 200% of the federal poverty level, according to the US Census 2000.[6] Types of criminal charges, which may be indicative of particular behavioral characteristics, were classified as follows: violent (e.g., assault, murder, harassment, resisting arrest, and hazing), drug sales, drug possession, public administration (e.g., bail jumping, criminal contempt), property (e.g., arson, burglary), weapons (e.g., use, sale, and possession of weapons), quality of life (e.g., loitering, disorderly conduct, public lewdness), and sex crimes (e.g., rape, sexual abuse). For those with only homelessness, the same set of independent variables (except for residence, nativity, and criminal charge information) was obtained from DHS admission records. Lastly, because no data were collected to measure behavioral or mental health characteristics, proxy data were used to explore factors such as the influence of substance use. Specifically, trajectory outcomes were compared between individuals charged with drug possession or released to substance use treatment clinics and those who were not. Also, the association of being discharged to state psychiatric hospitals or mental health treatment clinics from jail or shelters with trajectory outcomes was evaluated to explore the potential role of prior mental illness.

2.2.3. Statistical analysis

For the study cohort (N=15,620), all possible pairs of individuals were created, and the degree of dissimilarity in sequences of three events between pairs was assessed by using three edit functions (inserting, deleting, and substituting). Each edit function had a weight assigned, which was determined by transition probabilities, and repeating this process over all possible pairs generated a distance matrix known as Levenshtein matrix.[7] Then, a hierarchical cluster analysis

with Ward method was performed, which resulted in non-overlapping clusters, representing trajectory groups of jail incarceration and homelessness. R 2.15 version (Vienna, Austria) was used to perform sequence (*TraMineR* package) and cluster analyses (*cluster* package). These processes required for sequence analysis are illustrated in Figure 2.1. For the comparison groups (144,566 adults with incarceration events only and 34,350 adults with homelessness only), a parametric version of sequence analysis, growth mixture modeling, was performed to identify group-based trajectories of incarceration or homelessness during 2001-03 using *poLCA* package in R 2.15 version (Vienna, Austria). Both methods are conceptually similar, but growth mixture modeling is more efficient than sequence analysis when large samples are analyzed (Figure 2.1).[8] For sequence analysis, the optimal number of trajectory groups was determined according to the ratio of mean within-distances to mean between-distances <0.5 and relative improvement of this ratio due to adding one more group to the cluster analysis solution.[9] This approach is appropriate for sequence analysis because it takes into account pairwise sequence differences used in clustering, unlike other cluster validation measures requiring for identifying variable-based differences ("dimension"; e.g., differences in age or sex between study subjects).[9] For growth mixture modeling, a two-step validation approach was used. First, from sequence analysis using 10% random samples of adults with only incarceration and 40% of random samples of those with only homelessness, which was the maximum sample size for *TraMineR* package, an optimal group solution was obtained according to the above criteria. It was more appropriate to determine valid cluster numbers from sequence data compared with methods based on specific dimensions. Second, growth mixture modeling was performed for the entire sample, and trajectory groups that were consistent with the optimal solution from the first step in terms of the number of groups and shapes of trajectories were considered final.

Descriptive statistics were computed to summarize individual risk factors of the study population and trajectory groups of jail incarceration and/or homelessness. Then, trajectory groups were associated with each of these baseline characteristics by means of bivariate analysis. Statistical significance of bivariate association (two sided p-value <0.05) was evaluated using chi-square test for categorical variables or independent t-test with bonferroni adjustment for continuous variables. Additionally, multivariate association between baseline characteristics and trajectory groups was evaluated via multinomial logit model. Yet, because of the large sample size, which increases the chance to detect small differences to be statistically significant, magnitude of differences rather than statistical significance was more emphasized to describe risk profiles of each trajectory group.

2.3. Results

The majority of 194,536 individuals who were incarcerated in NYC jail or spent at least one night at NYC single adult shelter during 2001-03 were male (86%), aged 18-44 years (70%), and non-Hispanic black or Hispanic (85%) (Table 2.1). Of this population, 8% (N=15,620) had both jail incarceration and homelessness experiences, while the remaining individuals experienced only incarceration (N=144,566; 74%) or only homelessness (N=34,350; 18%). The population with both exposures, compared with NYC residents, was disproportionately composed of nonHispanic black males (55% vs. 10%), non-Hispanic blacks aged of 35-44 years (27% vs. 5%), and residents of poor neighborhoods (40% vs. 24%). Compared with those with only one exposure, this population had an even higher proportion of non-Hispanic blacks (62% vs. 51% of the incarceration-only population or 52% of the homelessness-only population) and individuals aged of 35-44 years (41% vs. 31% of the incarceration-only population or 32% of the homelessness-only population). Another distinct characteristic among those with both incarceration and homelessness was a higher prevalence of substance use behaviors and serious

mental illness according to proxy measures. Lastly, having both incarceration and homelessness experiences, as opposed to only incarceration, was associated with particular criminal charges, including property crimes (41% vs. 26%) and drug possession (37% vs. 30%).

2.3.1. Adults with both incarceration and homelessness

Sequence analysis identified six non-overlapping groups of jail incarceration and homelessness trajectories among adults with both incarceration and homelessness (Figure 2.2; Table 2.2). Each plot in Figure 2.2 consists of stacked lines (y-axis) that represent individuals' sequences of monthly events over three years (x-axis). The majority (**Temporary**; N=9,467) spent most time outside of jail and shelters and sporadically experienced brief jail incarceration and shelter stays over three years. For example, individuals in this group were incarcerated for two or three days, and spent several months in the community before returning to jail or staying in shelters briefly. With these sporadic incarceration/homelessness events, they spent most time outside of shelter and jail. In contrast, another group that spent extensive amounts of time in shelters (median 662 days) without much interruption and had few brief incarcerations were classified as **Continuously homeless** pattern (N=691). Two trajectory patterns represented adults who increasingly used homeless shelters during later months after sporadic incarceration events (**Increasingly homeless**; N=1,793) and those who had early homelessness, followed by community stays with sporadic incarceration (**Decreasingly homeless**; N=1,033). Despite different sequencing, these two groups were similar in terms of aggregate time and frequencies of incarceration. Similarly, there were adults with early homelessness, followed by incarceration during later months (**Increasingly incarcerated**; N=1,343) and those with incarceration during early months and community-dwelling or sporadic homelessness afterwards (**Decreasingly incarcerated**; N=1,293).

Baseline demographic characteristics and neighborhood poverty were similar across all trajectory groups except for **Continuously homeless** individuals who were much older than the others (Table 2.3). Approximately 50% of individuals with **Continuously homeless, Increasingly incarcerated,** and **Decreasingly incarcerated patterns** had an indication of substance use, while prevalence of serious mental illness in **Continuously homeless** group was the highest. NYC jail inmates charged with drug possession, drug sales, property, and violent crimes were more likely to be **Increasingly** or **Decreasingly incarcerated** during 2001-03 compared to those with other crimes. In the multivariate analysis, all baseline characteristics except for sex, neighborhood poverty, and quality of care crimes were statistically significantly associated with trajectory groups (data not shown).

2.3.2. Adults with incarceration only

Among adults with only incarceration events, growth mixture modeling identified four trajectory groups that represent **Temporary**, **Decreasingly**, **Increasingly**, and **Continuously incarcerated** patterns (Figure 2.3). Sequence analysis based on 10% random samples confirmed that this cluster solution met the validity criteria (Figure 2.3; Table 2.2). 70% of this population had a brief history of incarceration over three years (**Temporary**), whereas 9% had extensive incarceration experiences characterized by lengthy jail stay during 2001-03 (**Continuously incarcerated**). The remaining 21% exhibited a structured pattern of incarceration during the early months, followed by community-dwelling (**Decreasingly incarcerated**; N=15,174) or vice versa (**Increasingly incarcerated**; N=16,282). Demographic, neighborhood, and criminal characteristics were in general comparable across the four trajectory groups, except for individuals with the **Continuously incarcerated** pattern whose percent charged with drug

possession, drug sales, and property crimes was almost two-fold higher than that among those with **Temporary** pattern (Table 2.4).

2.3.3. Adults with homelessness only

Similar to incarceration-only population, the growth mixture modeling identified four shelter use patterns among adults with homelessness only, which were determined to be optimal according to cluster validation criteria (Figure 2.4; Table 2.2). A majority of the homelessness-only population (59%) exhibited a small number of shelter admission episodes with brief shelter stays in 2001-03 (**Temporary**). 14% had a pattern of increasing use of shelter (**Increasingly homeless**), while 15% had a pattern of an intensive shelter use at the earlier periods and then later had sporadic brief shelter stays (**Decreasingly homeless**). Lastly, there was a pattern representing continuously-sheltered individuals over three-year period (**Continuously homeless**; 11%). **Temporary** users were much younger than those with the other patterns, whereas the opposite was found among **Continuously homeless** people (Table 2.5). Distributions of sex and race/ethnicity were similar across the four homelessness patterns.

2.4. Discussion

NYC adults with both homelessness and incarceration experiences during 2001-03 were predominantly minority males aged 25 to 44 years from poor NYC neighborhoods. While this population's characteristics were sociodemographically similar to that of the overall NYC incarcerated population during the same period,[10] there were particular characteristics that made this group unique, including high prevalence of substance use and property crimes compared to those with incarceration only? (Table 2.1). This finding was consistent with observations from a US national sample of jail inmates with homelessness collected in 2002.[11] Compared with adults

residing in NYC single adult homeless shelters during 2001-03 with no history of incarceration, adults with both experiences were disproportionately younger and male.

According to sequence analysis, there were non-overlapping clusters of individuals with distinct timing and sequencing of longitudinal experiences of incarceration and homelessness. By ignoring sequencing taking into account incarceration, homelessness, and community-dwelling periods, aggregate measures (e.g., total length of shelter stay, total number of incarceration events) would not identify these patterns. **Temporary** pattern was the largest group (61%), representing sporadic experiences of incarceration and homelessness with brief stays. Even if total number of incarceration or homelessness events was small in this pattern, it appeared to be most consistent with the concept of the revolving door pattern that composes of frequent occurrences of brief incarceration and homelessness, compared with the other patterns characterized by persistent jail or shelter stays. One possible mechanism that links **Temporary** pattern with the revolving door pattern is that brief exposure to incarceration and homelessness, as opposed to persistent stays in jail or shelters, is more likely to generate life disruption, which in turn lead to elevated stress levels and interrupt the continuity of essential health care. Another mechanism is that individuals with **Temporary** pattern are less likely to benefit from health care services in jails or shelters and receive proper discharge plans than those who stayed longer in these institutions.

All the other groups had either incarceration or homelessness sustained for a certain time period. In particular, two trajectory groups (**Increasingly homeless** and **Decreasingly homeless** patterns) had patterns of consistent homelessness and sporadic incarceration events, but were different from each other in terms of sequencing. One group had homelessness experiences

during the early months followed by few incarceration events, whereas the other had sporadic incarceration events transitioned to consistent homelessness during later months. These two contrasting patterns would not have been identified if incarceration/homelessness events were aggregated into total number of episodes or total length of stay. In addition, sequencing allowed for identification of consistent incarceration and sporadic homelessness trajectories (N=2,636; 17%), while the remaining 4% had homelessness persist throughout three-year observation time (N=691). A recent NYC study identified shelter use trajectories of more diverse timing and sequencing than the current study (e.g., initial shelter, early-mid shelter patterns).[10] This difference may be due to its smaller sample size (70 vs. 15,620) and shorter follow-up time (two years vs. three years).

Demographic and criminal characteristics were comparable across the six trajectory groups of incarceration/homelessness except for those with **Increasingly incarcerated** or **Continuously homeless** patterns, who were more likely to be charged with property and violent crimes (**Increasingly incarcerated**) or older (**Continuously homeless**) than the others. These baseline differences can be controlled for via statistical techniques such as inverse probability of treatment weighting, which then allows us to examine whether different trajectories of institutionalization influences health risk beyond individual-level risk factors. Once baseline characteristics are balanced out across trajectory groups, the exposure-outcome association may empirically point to unique contribution of temporal exposure to incarceration or homelessness to health risk or artifact of data affected by unobserved confounding.

Within similar trajectory groups across the study cohort and comparison populations, short and frequent experiences of incarceration or homelessness appeared to be more common among

people with dual exposures relative to a single exposure. In addition, among the subset of incarcerated people with temporary trajectories, particular criminal characteristics such as property crimes and drug possession were more prevalent among those with both experiences as opposed to incarceration only. Given drug possession may be a proxy measure of substance use, these findings support the hypothesis that risk factors associated with adverse health conditions are more commonly found among people exposed to both incarceration and homelessness. High prevalence of property crimes may indicate material deprivation or financial stresses in this population,[11] but it may also reflect disruptive behaviors resulting from substance use or mental illness.

The study had several limitations. First, validity of trajectory grouping has been criticized because it is often difficult to replicate using a different population.[12] To address this limitation, I adopted a method to thoroughly ensure validity of the trajectory grouping. Specifically, I examined within and between distance ratios of trajectory groups among both the study cohort and comparison groups, and selected the trajectory grouping solution with the ratios that first became <0.5 (i.e., an indicator of valid grouping) and substantially decreased relative to the previous solution.[9] Second, a process of identifying groups of trajectories requires a strong assumption that heterogeneity of individual-level trajectories is derived from latent groups, not an underlying continuous distribution such as life course development of IQ, psychological attributes, and employment.[13] Even if this assumption seems plausible (e.g., being homeless or incarcerated is a major life disruption; the policy convention recognizes unique groups of homeless adults such as chronic and episodic homelessness),[14] more research is required to reinforce theoretical and empirical support for group-based trajectory modeling approach. Third, 16% of discharge locations from all incarceration events were recorded as state or federal prisons

according to NYC jail registry. Because time after release from jails and shelters was defined as community-dwelling in this study, there might be potential bias due to misclassifying actual prison stay as community-dwelling. When one-year uninterrupted community-dwelling after prison release was considered as a proxy of true prison stay, this type of event was concentrated among individuals with persistent incarceration during early months, followed by communitydwelling; 26% in this group had proxy prison stay whereas 0% to 10% of those with other patterns had the proxy prison stay. Taken together, misclassification error did not seem substantial, although interpretation of results for those who transitioned to community-dwelling from persistent jail stays should be made with caution. In addition, given that most homeless people also left shelters and stayed in the community, time after a homeless shelter stay was considered comparable to time after jail, which further justifies defining time outside of jails and shelters as community-dwelling. Fourth, homelessness, incarceration, and residing in the community were determined according to NYC single adult shelter use and NYC jail admission/discharge dates, which may underestimate true incarceration/homelessness events (e.g., street homelessness, incarceration outside of NYC). This bias, however, may be counterbalanced by overestimation of true community-dwelling, and improved validity and reliability of measures from administrative data as opposed to self-reports. Lastly, matched data from multiple registries do not have much information about risk behaviors, prior mental illness, and traumatic childhood events. Given that these characteristics have been associated with frequent incarceration and homelessness,[10,11] these unmeasured factors should be accounted for to assess health risk attributed to the revolving door pattern.

A main strength of this study is that combined administrative data for three years has allowed us to generate comprehensive profiles of the transient population and detailed information about jail

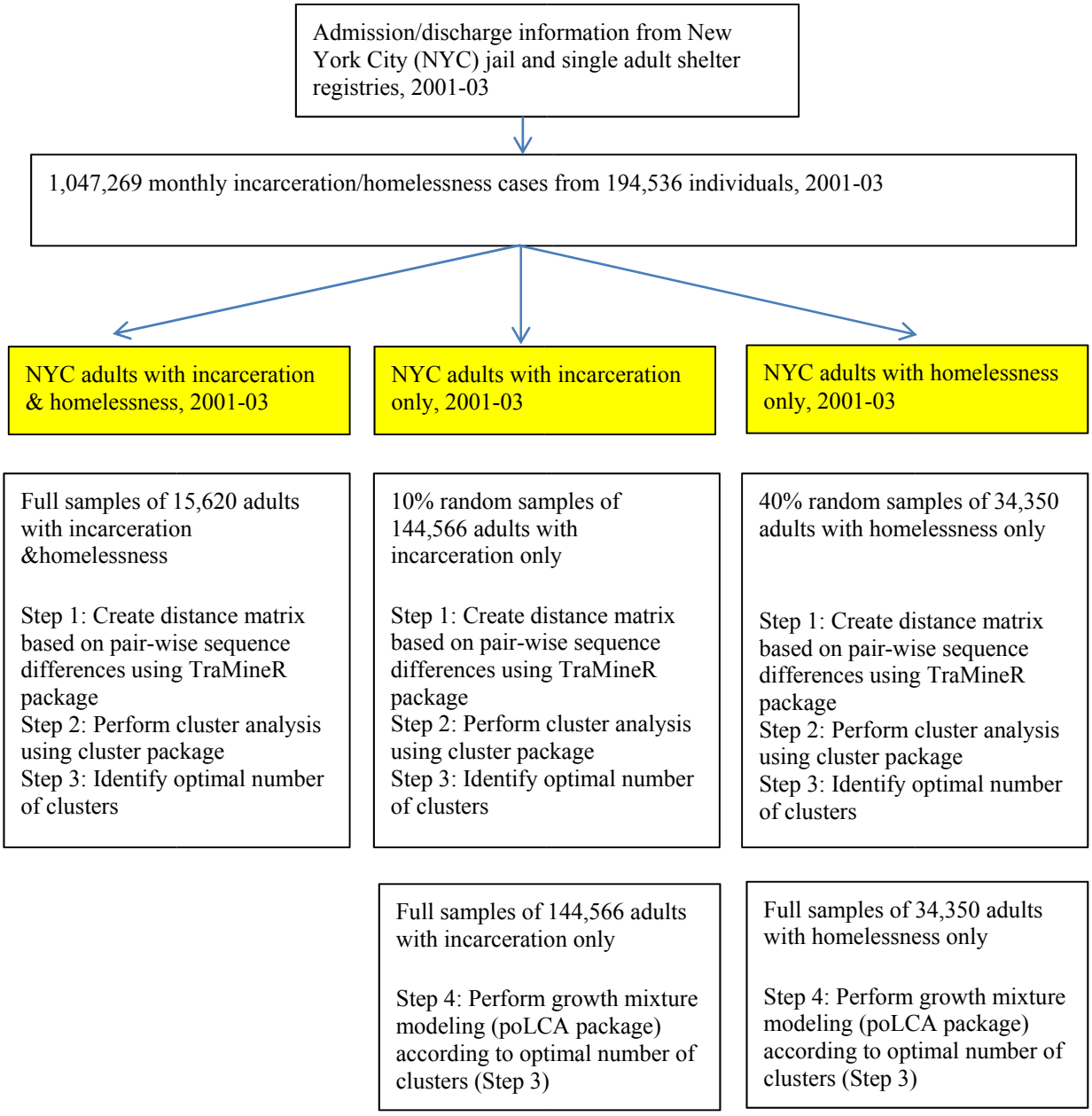
incarceration and homeless shelter use over three years, which we can then use to examine the influences of these patterns on health. A related strength is that longitudinal exposure of jail incarceration and homelessness was measured by group-based trajectories. Sequences of jail incarceration and homelessness events were accounted for, and summarized into distinct groups of individuals. These groups seem more nuanced than previously used time-aggregated groupings to measure homeless trajectories consisting of transitional (e.g., short-term homelessness followed by no such events), episodic (e.g., frequent homelessness), and chronic patterns (e.g., long-term homelessness without much interruption).[14] For example, using the conventional approach, individuals with **Temporary** pattern might have been classified as either episodic or transitional group. As transitions and specific timings can characterize particular life challenges, group-based trajectories potentially improve construct validity compared with a simple indicator or time-aggregated measures of each event.[15,16]

In conclusion, adults who were both incarcerated and sheltered in NYC during the study time period were more likely to be charged with property crimes and use substances than incarceration-only or homelessness-only population. Within this high risk population, groupbased trajectory modeling revealed diverse trajectories of incarceration/homelessness. While about 60% sporadically experienced brief jail and shelter stays, the remaining 40% had mixed experiences of jail incarceration and homelessness in various lengths and frequencies. Between some trajectory groups (e.g., **Temporary** vs. **Increasingly homeless**), basic demographic and criminal characteristics were similar, indicating that particular trajectories of incarceration and homelessness might plausibly be associated with adverse health conditions, independent of individual risk factors. This study finding highlights benefits of sequence analysis to generate temporal measures that more accurately capture complex trajectories. Whether or not

this more nuanced approach helps elucidate health risks remains an empirical question to be tested. When associated with health outcomes, trajectory grouping will contribute to understanding

mechanisms that exposure to incarceration and homelessness leads to health risk.

Figure 2.1. Diagrams of group-based trajectory modeling used for adults who were incarcerated in New York City jail or spent at least one night at New York City single adult shelter in 20012003



Notes: If both jail incarceration and homelessness occurred within a month, the number of jail and shelter days was counted and the event with higher numbers of days was assigned to that month. If an equal number of days were spent in both (678 out of 1,047,269 monthly incarceration/homelessness cases), the event less prevalent in individual-level sequence was assigned. Of 678 cases, 62% had jail incarceration assigned, and the remaining 38% were determined to be a homelessness event.

Table 2.1. Demographic and criminal characteristics among adults who were incarcerated in New York City jail or spent at least one night at New York City single adult shelter in 2001-2003

	New York City	Total study adults§	Incarceration & homelessness	Incarceration only	Homelessness only
N	6,024,760	194,536	15,620	144,566	34,350

			Column %		
Age as of June 30, 2002					
18-24 years 25-34 years	13% 23%	19% 30%	11% 25%	22% 33%	9% 20%
35-44 years	17%	15%	41%	30%	31%
45-54 years 55-89 years	26%	5%	19% 5%	12% 4%	25% 14%
Sex†	46%	86%			
Male	54%	14%	90%	89%	72%
Female			10%	11%	28%
Race/ethnicity†	38%	10% 52%			
Non-Hispanic white	23%	33%	7%	10%	13%
Non-Hispanic black	25% 10%	1% 4%	62% 30%	51% 36%	53%
Hispanic	4%	26%	0% 1%	1%	24%
Asian		1%	41%	2%	1% 8%
Others/unknown			3%	30%	3%
Substance use¶				1%	3%
Prior serious mental illness¶			90%		
Nativity†‡			10%	78%	
United States born				22%	
Foreign born	9%		2%		
Neighborhood poverty‡	44% 20%		16% 10%	3%	
Low (<10% below poverty)	24%		40%	20%	
Medium (10 to <20%)				12%	
High (20 to <30%)				39%	
Very high (≥30%)					
Missing	3%		33%	26%	
Types of criminal charges‡					
Drug possession			37%	30%	
Drug sales			21%	18%	

Violence	32%	32%
Public administration	31%	27%
Property	41%	26%
Weapons	4%	7%
Quality of life	9%	6%
Sex crimes	3%	3%

Notes:
†Because a small % of missing data (sex: 1%, race/ethnicity: 1%, nativity: 1% among adults with incarceration), sum of these numbers were not matched up with total numbers of individuals.
¶Proxy measures were used to capture substance use and prior severe mental illness conditions (see Methods).
‡Data about Nativity, neighborhood of residence, and criminal charges were only available in the Department of Correction registry.

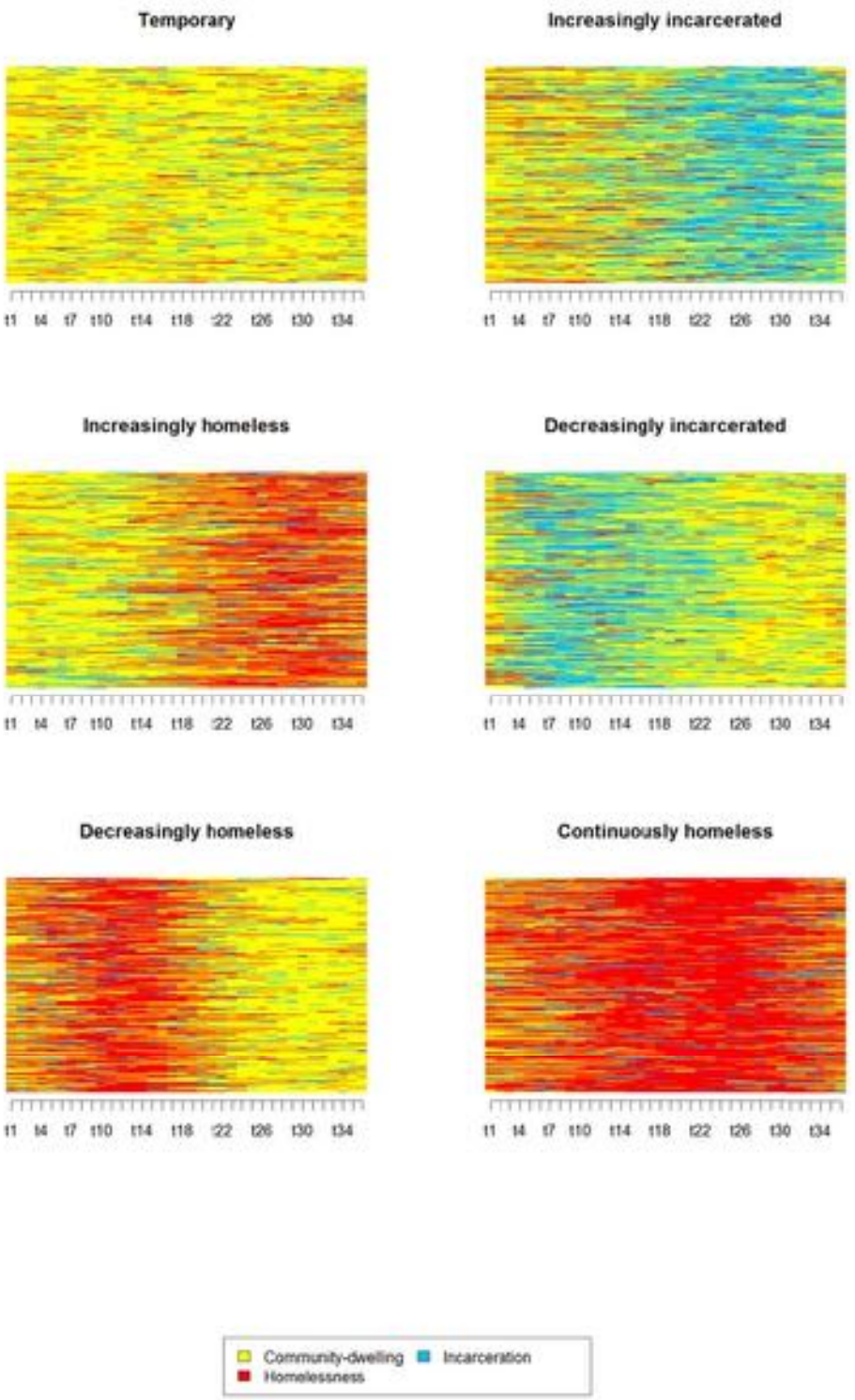
§Data came from United States Census 2000, restricted to New York City adults aged 18-89 years.

Table 2.2. Mean within and between cluster distance ratios

Cluster number	Incarceration only (N=144,566)		Homelessness only (N=34,350)		Incarceration and homelessness (N=15,620)			
	Mean w/mean b	Δw/b	Mean w/mean b	Δw/b	Mean w/mean b	Δw/b		
2	0.294		0.310		0.609			
3	0.416	0.122	0.487	0.177	0.544	-0.065		
4	**0.334**	**-0.082**	**0.259**	**-0.228**	0.511	-0.033		
5	0.282	-0.052	0.253	-0.006	0.502	-0.009		
6					0.248	-0.005	**0.486**	**-0.015**
7					0.483	-0.003		
8					0.479	-0.004		

Abbreviations: w = within-distance; b = between-distance; Δw/b = change in mean w/mean b
The optimal solution should meet two criteria: 1) mean within-distance/between-distance ratio <0.50 and 2) large decrease in mean within-distance/between distance ratio by increasing an additional cluster. Numbers in bold indicate the optimal solution according to these thresholds.

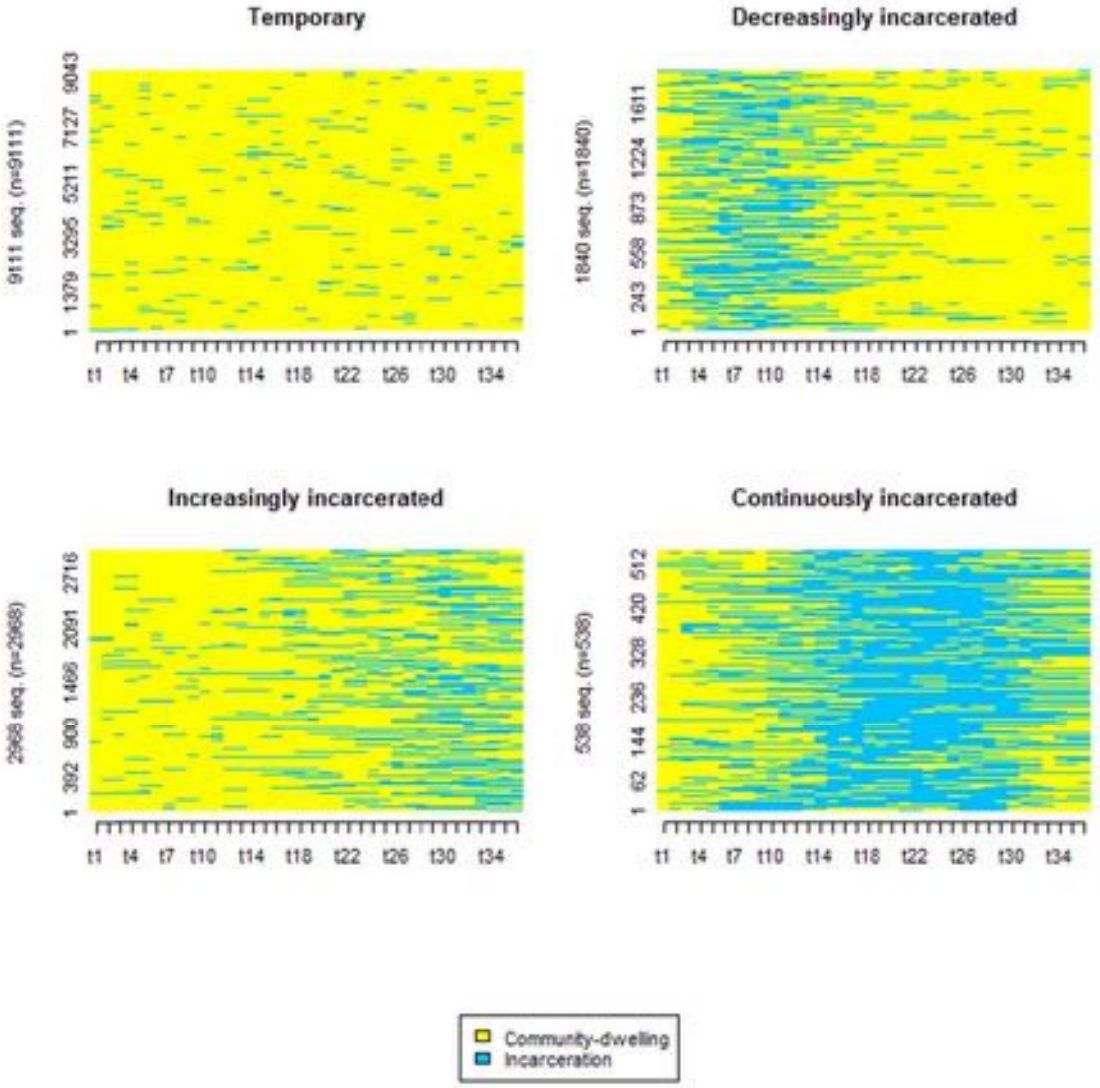
Figure 2.2. Six non-overlapping groups of jail incarceration/homelessness trajectories according to sequence analysis among 15,620 adults who spent at least one night in a New York City jail and at least one night at a New York City single adult homeless shelters in 2001-2003



Notes: x axis represents a single month during 2001 through 2003 (maximum: 36 months) and y axis represents number of people.

Figure 2.3. Four non-overlapping groups of incarceration trajectories according to group-based trajectory modeling among 144,566 adults who were incarcerated in a New York City jail and did not stay in New York City single adult shelters in 2001-2003

a. 10% random sample (N=14,457)



b. The whole population (N=144,566)

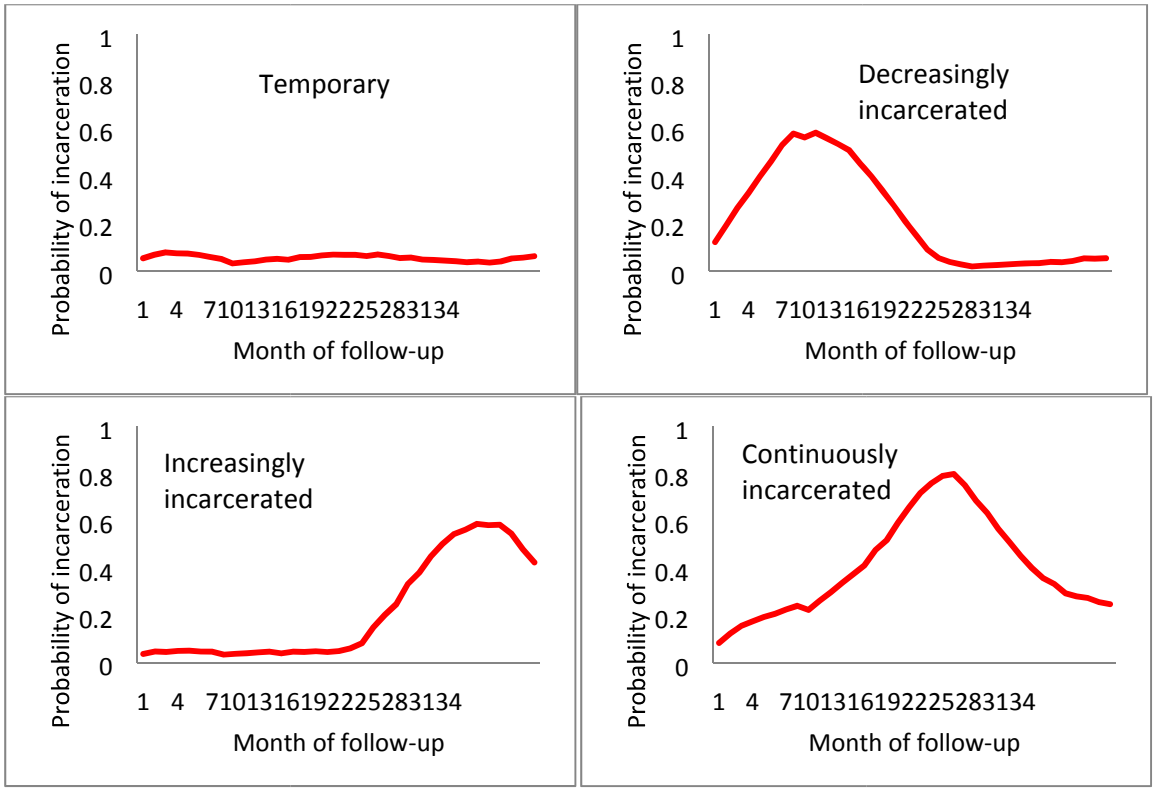
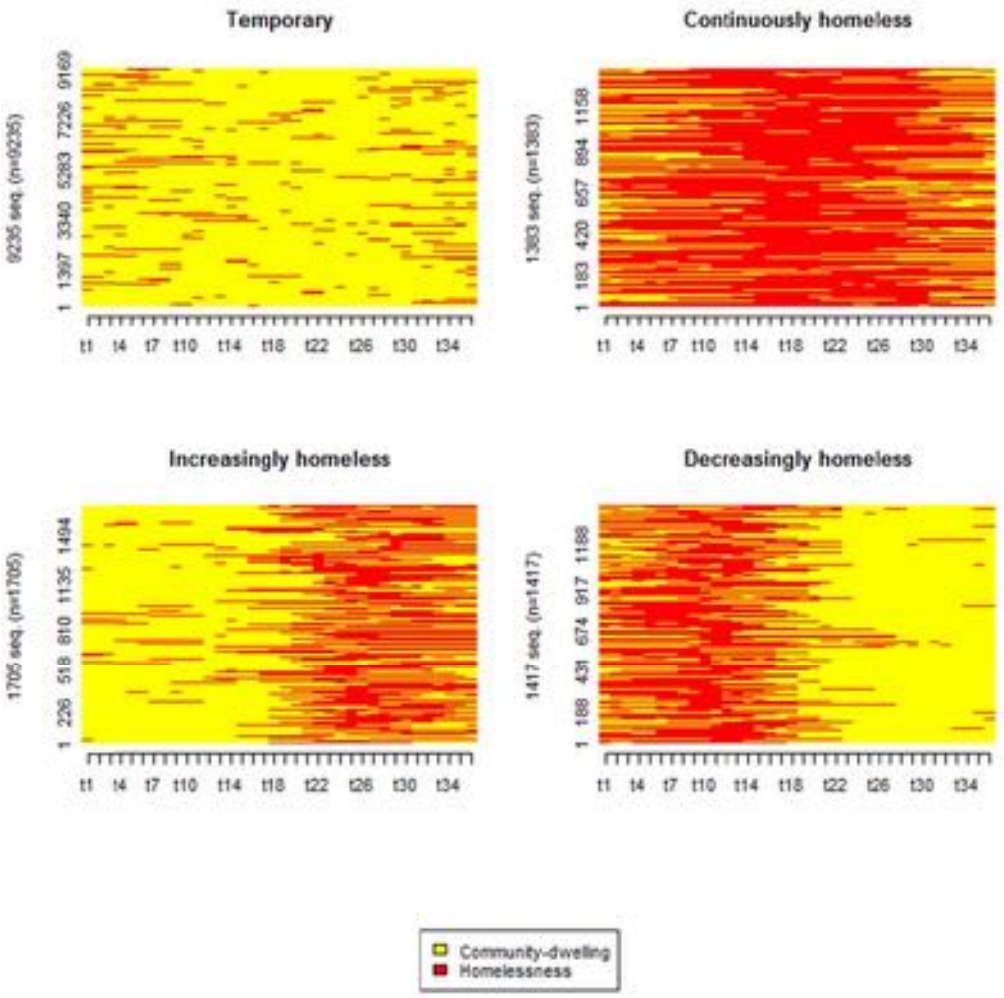


Figure 2.4. Four non-overlapping groups of homelessness trajectories according to group-based trajectory modeling among 34,350 adults who spent at least one night in New York City single adult homeless shelters and were not incarcerated in New York City jail in 2001-2003

a. 40% random sample (N=13,740)



b. The whole population (N=34,350)

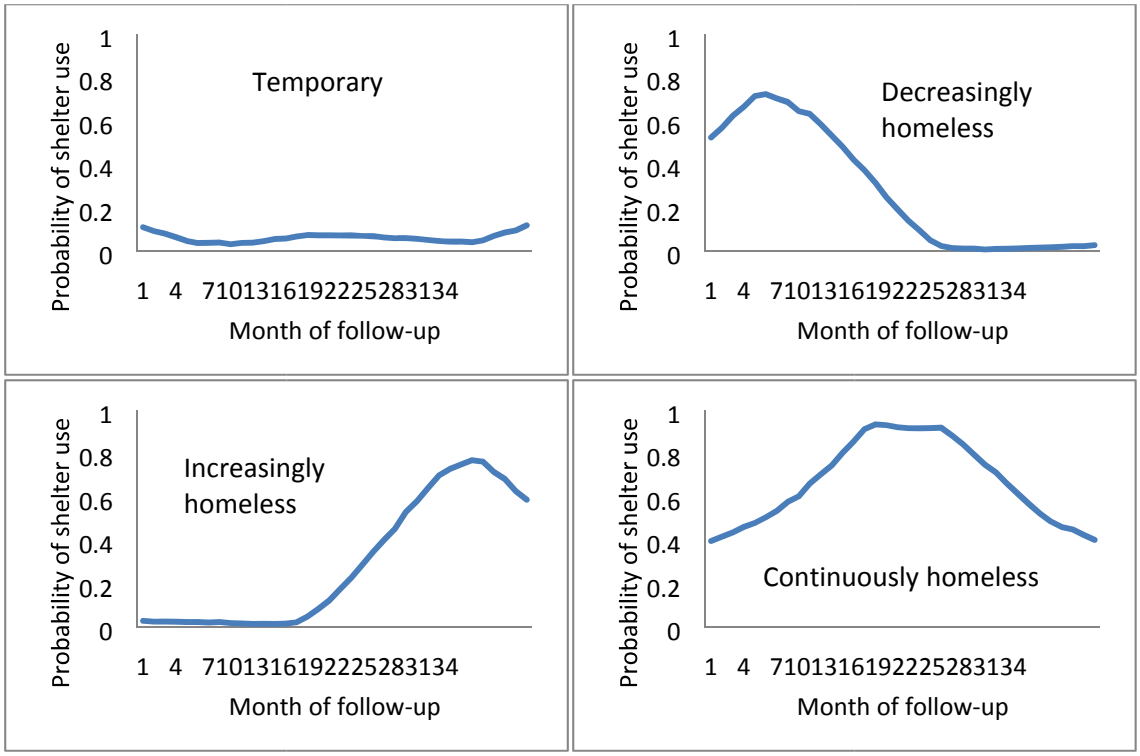

Temporary
Probability of shelter use
1
0.8
0.6
0.4
0.2
0
1 4 7 10 13 16 19 22 25 28 31 34
Month of follow-up
Decreasingly homeless
Probability of shelter use
1
0.8
0.6
0.4
0.2
0
1 4 7 10 13 16 19 22 25 28 31 34
Month of follow-up
Increasingly homeless
Probability of shelter use
1
0.8
0.6
0.4
0.2
0
1 4 7 10 13 16 19 22 25 28 31 34
Month of follow-up
Continuously homeless
Probability of shelter use
1
0.8
0.6
0.4
0.2
0
1 4 7 10 13 16 19 22 25 28 31 34
Month of follow-up

Table 2.3. Demographic and criminal characteristics by six trajectory groups among 15,620 adults who were incarcerated in New York City jail and spent at least one night at New York City single adult shelter in 2001-2003

	Temporary	Increasingly incarcerated	Increasingly homeless	Decreasingly incarcerated	Decreasingly homeless	Continuously homeless	Total

Total	15,620	9,467	1,343	1,793	1,293	1,033	691
Exposure in 2001-03							
Median # of incarceration events	2	1	4	2	3	1	2
Median days in jail	54	34	301	39 19	259	26 12	22
Median jail days per incarceration	25 4	19 3	82 4	11	83	11	11
Median # of shelter use events	42	20	32	273	3	314	21
Median days in shelters	8	6	6	25	20	29	662
Median shelter days per shelter event					6		33
Age as of 6/30/2002							
18-24 years	11%	12% 26%	10% 27%	9%		8%	
25-34 years	25%	40%	45%	21%	10% 25%	21%	5%
35-44 years	41%	18% 4%	15% 3%	40%	46%	41%	15%
45-54 years	19%			24% 6%	15% 4%	25% 5%	39%
55-89 years	5%	90% 10%	92%				32%
Sex†			8%	90% 10%	91%	90% 10%	9%
Male	90%	8%			9%		
Female	10%	60%	6%	6%		7%	89%
Race/ethnicity†		31%	65%	64%	5%	66%	11%
Non-Hispanic white	7%	0%	28%	29%	64%	26%	
Non-Hispanic black	62%	1%	0%	0%	30%	0%	6%
Hispanic	30%		1%	1%	0%	1%	69%
Asian	0%				1%		24%
Others/unknown	1%						0%
							1%
Nativity†‡							
United States born	90%	89%	91%	88%	94%	88%	88%

Foreign born	10%	11%	9%	12%	6%	12%	12%
Neighborhood poverty‡							
Low (<10% below poverty)	2%	2%	2%	3%	2%	3%	4%
Medium (10 to <20%)	16%	16%	16%	15%	16%	13%	15%
High (20 to <30%)	10%	10%	9%	10%	9%	9%	8%
Very high (≥30%)	40%	40%	41%	40%	39%	40%	35%
Missing	33%	32%	32%	32%	33%	35%	38%
Types of criminal charges‡							
Drug possession	37%	34%	51%	35%	46%	35%	43%
Drug sales	21%	18%	31%	19%	35%	14%	22%
Violence	32%	30%	46%	33%	40%	30%	28%
Public administration	31%	30%	40%	31%	36%	30%	29%
Property	41%	37%	60%	39%	53%	40%	44%
Weapons	4%	4%	7%	5%	5%	3%	3%
Quality of life	9%	9%	9%	9%	7%	9%	9%
Sex crimes	3%	2%	3%	3%	4%	3%	4%
Substance use¶	41%	37%	54%	42%	49%	39%	51%
Serious mental illness¶	3%	2%	4%	6%	2%	6%	9%

Notes: All bivariate associations were statistically significant except for quality of life charges. In the multivariate analysis, all baseline characteristics except for sex, neighborhood poverty, and quality of care crimes were statistically significantly associated with trajectory groups.
Average numbers of incarceration events were significantly different across trajectory groups except for the following: Temporary vs. Decreasingly homeless patterns.
Average numbers of homelessness events were significantly different across trajectory groups except for the following: Temporary vs. Decreasingly incarcerated, and Increasingly homeless vs. Decreasingly homeless patterns.
Average numbers of jail days were significantly different across trajectory groups except for Temporary, Decreasingly, and Continuously homeless patterns.
Average numbers of homelessness days were significantly different across trajectory groups except for Temporary vs. Decreasingly incarcerated patterns.
†Because a small % of missing data (sex: 1%, race/ethnicity: 1%, nativity: 1% among adults with incarceration were not included, sum of these numbers were not matched up with total numbers of individuals.
¶Proxy measures were used to capture substance use and prior severe mental illness conditions.
‡Data about Nativity, neighborhood of residence, and criminal charges were only available in the Department of Correction registry.

Table 2.4. Demographic and criminal characteristics by four trajectory groups among 144,566 adults who were incarcerated in New York City jail and did not stay in New York City single adult shelters in 2001-2003

	Total	Temporary	Decreasingly incarcerated	Increasingly incarcerated	Continuously incarcerated
Total	144,566	100,172	15,174	16,282	12,938
Exposure in 2001-03					
Median # of incarceration events	1	1	2	2	3
Median days in jail	21	5	164	143	289
Median jail days per incarceration	13	5	87	72	102
			Column %		
Age as of 6/30/2002					
18-24 years	22%	21%	23%	23%	23%
25-34 years	33%	33%	31%	33%	32%
35-44 years	30%	30%	32%	31%	33%
45-54 years	12%	13%	11%	10%	10%
55-89 years	4%	3%	3%	3%	2%
Sex†					
Male	89%	89%	89%	91%	91%
Female	11%	11%	11%	9%	9%
Race/ethnicity†					
Non-Hispanic white	10%	11%	8%	8%	7%
Non-Hispanic black	51%	50%	54%	54%	56%
Hispanic	36%	35%	37%	36%	35%
Asian	1%	1%	0%	0%	0%
Others/unknown	2%	3%	2%	2%	2%
Nativity†					

United States born	78%	76%	86%	82%	86%
Foreign born	22%	24%	14%	18%	14%
Neighborhood poverty					
Low (<10% below poverty)	3%	3%	2%	2%	2%
Medium (10 to <20%)	20%	21%	18%	18%	18%
High (20 to <30%)	12%	13%	12%	12%	11%
Very high (≥30%)	39%	38%	42%	42%	41%
Missing	26%	26%	26%	26%	27%
Types of criminal charges					
Drug possession	30%	26%	37%	39%	44%
Drug sales	18%	14%	29%	27%	31%
Violence	32%	30%	34%	36%	43%
Public administration	27%	25%	26%	29%	33%
Property	26%	23%	30%	35%	41%
Weapons	7%	6%	7%	9%	9%
Quality of life	6%	7%	5%	5%	6%
Sex crimes	3%	3%	3%	4%	4%
Released to state psychiatric hospitals	1%	0%	1%	1%	2%

Notes: All bivariate and multivariate associations were statistically significant.
†Because a small % of missing data (sex: 1%, race/ethnicity: 1%, nativity: 1% among adults with incarceration were not included, sum of these numbers were not matched up with total numbers of individuals.

Table 2.5. Demographic and criminal characteristics by four trajectory groups among 34,350 adults who spent at least one night at New York City single adult shelter and were not incarcerated in New York City jail in 2001-2003

	Total	Temporary homeless	Decreasingly homeless	Increasingly homeless	Continuously homeless
Total	34,350	20,148	5,295	5,082	3,825
Exposure in 2001-03					

Median # of shelter use events	3	2	5	6	10
Median days in shelters	64	13	227	240	642
Median shelter days per shelter event	15	6	49	41	63
			Column %		
Age as of 6/30/2002					
18-24 years	9%	16%	7%	12%	5%
25-34 years	20%	25%	17%	20%	13%
35-44 years	31%	31%	32%	33%	31%
45-54 years	25%	18%	27%	26%	34%
55-89 years	14%	10%	17%	9%	17%
Sex†					
Male	72%	72%	69%	68%	76%
Female	28%	28%	31%	31%	24%
Race/ethnicity†					
Non-Hispanic white	13%	15%	12%	12%	12%
Non-Hispanic black	53%	50%	57%	59%	57%
Hispanic	24%	25%	21%	23%	22%
Asian	1%	1%	1%	1%	1%
Others/unknown	8%	9%	10%	5%	7%
Discharged for substance use treatment	3%	2%	4%	5%	7%
Discharged for mental health treatment	3%	2%	5%	4%	7%

Notes: All bivariate and multivariate associations were statistically significant.
†Because a small % of missing data (sex: 1%, race/ethnicity: 1%, nativity: 1% among adults with incarceration were not included, sum of these numbers were not matched up with total numbers of individuals.

Chapter 3. Risk of all-cause, drug-related, and HIV mortality by three-year trajectories of jail incarceration and homelessness among incarcerated/sheltered New York City in 200405

3.1. Introduction

Frequent transitions between incarceration and homelessness ("the revolving door pattern") have been linked with adverse health conditions.[1,2] These experiences have been postulated as a process or determinant that damages biological systems and disrupts stable access to healthpromoting resources.[3-5] A limited body of studies provides evidence that mortality and morbidity risk is independently associated with temporal aspects of incarceration or homelessness experiences. For example, the time immediately after release as opposed to a later time among NYC former jail inmates was associated with greater risk of drug-related death,[6] while spending shorter time in shelters was associated with lower risk of new HIV diagnoses among NYC adults with homelessness.[7]

Prior risk profiles or static measures of incarceration/homelessness experiences may not be able to explain these time-varying associations. The previous chapter revealed diverse trajectory groups that represent complex three-year trajectories of jail incarceration and homelessness among NYC adults. For example, about 60% of NYC adults who were sheltered and incarcerated in 2001-03 experienced potentially more disruptive short-term incarceration and homelessness, while the remaining 40% exhibited trajectories of more persistent incarceration or homelessness. The purpose of this study was to test whether longitudinal exposure to incarceration/homelessness events, which were captured in trajectory groups from Chapter 2, contributed to risk of all-cause, drug-related, and HIV mortalities among NYC adults. The study first made a population-level inference by comparing mortality rates among incarcerated/sheltered NYC adults with those among unexposed NYC counterparts. Then,

focusing on those with both jail incarceration and homelessness, it attempted to draw causal inference from associations between the revolving door pattern and mortality.

3.2. Methods

3.2.1. Samples

The study population comprised of 15,620 individuals with both jail incarceration and homelessness, 144,566 individuals with incarceration-only, and 34,350 individuals with homelessness-only during 2001-03 as described in Chapter 1. A comparison group was nonincarcerated and non-sheltered NYC adults (N=5,830,224). For the study population, the combined administrative data from NYC jail and NYC single adult shelter registries provided jail incarceration/shelter use records and baseline demographic and criminal information. From the matched NYC vital statistics data, death events during 2004-05 were enumerated for this population. Because there were no individual-level data for the comparison group, two population-level data sources − US Census 2000 and NYC vital statistics registries − were used to estimate mortality during 2004-05.

3.2.2. Study variables

Primary outcome variables included all-cause deaths, deaths due to drug-related causes (F11-F16, F18-F19, X40-X42, X44), and deaths due to HIV (B20-B24) according to the International Classification of Disease, 10th revision.[8] The main exposure variable was the polytomous set of six trajectories of jail incarceration/homelessness from Chapter 2. Potential confounders for exposure-outcome association were identified using Directed Acyclic Graph (DAG), which is a conceptual tool to graphically describe a structural framework that variables are connected by directed arrows representing causal effects.[9] As illustrated in Figure 3.1, baseline demographic

(age, sex, race/ethnicity, neighborhood poverty) and behavioral characteristics (proxy substance use), type of criminal charges, and proxy prior mental health conditions were identified a priori as confounders of the jail incarceration/homelessness trajectory–mortality association. Study participation (i.e., censoring) was identified as a collider of that association (i.e., a common effect of exposure and outcome) because one would need to be found in NYC DOC/DHS registries to have a particular trajectory of incarceration/homelessness assigned, and would need to have survived in 2001-03. Because this study was conditioned on those who were homeless or jailed and survived during the study time period, additional analytic steps (described in the next section below) were taken to attempt to address any selection biases this introduced.

To account for differential time at risk, person-years were calculated and used as a denominator of mortality rates. For those who died in 2004-05, person-years were calculated as the time between January 1, 2004 and the date of death. Two years was used for those who were alive as of December 31, 2005. For non-incarcerated and non-sheltered individuals (comparison group), person-years were estimated by subtracting total person-years of the study population from proxy person-years of NYC adults in 2004-05 (=2*NYC adult population counts from US Census 2000).

3.2.3. Statistical analysis

Standardized Mortality Ratio

The mortality rate for each trajectory was compared with that among non-incarcerated/nonsheltered NYC adults by means of Standardized Mortality Ratio (SMR). Specifically, for adults with incarceration events only (N=144,566) or both incarceration and homelessness (N=15,620), the observed numbers of deaths was counted in each trajectory of jail

incarceration/homelessness, and expected numbers of deaths was obtained by multiplying the age-, sex-, race/ethnicity-, and neighborhood poverty-specific mortality rates of non-incarcerated/non-sheltered NYC residents by the person-years for each trajectory in corresponding age, sex, race/ethnicity, and neighborhood poverty strata. SMR was the ratio of the observed over the expected number of deaths. The Poisson method was used to compute 95% two-sided confidence intervals for the SMRs. For adults with homelessness only (N=34,350), an SMR was obtained using the same method, but not adjusted for neighborhood poverty because of the large amount of missing data
(homelessness often results in missing zipcode of residence).

Marginal structural modeling for NYC adults with both jail incarceration and homelessness To determine whether particular trajectories are causally associated with mortality, data should meet three causal assumptions. Under the exchangeability assumption, the probability of having each trajectory ("propensity score") should be independent of covariates that are causally related with mortality, which creates a condition that the risk of a health outcome would change as a result of the change in one's trajectory of incarceration and homeless shelter experiences.[10] To establish this condition, I first performed multinomial regression analysis using group-based trajectories of incarceration/homelessness (dependent variable), and baseline covariates that were identified as confounders via DAG (independent variables: age; sex; race/ethnicity; nativity; neighborhood poverty; a proxy measure of substance use; a proxy measure of mental illness; and criminal charges due to drug sales, violent crimes, weapon possession, public administration, property crimes, quality of life crimes, and sex crimes). This model, known as propensity score model, yielded an individual's probability of being in each trajectory group. Weighting the exposure-outcome relationship by an inverse of this score (inverse probability of treatment weight; IPTW)

blocks pathways from potential confounders to exposure and establishes exchangeability (Appendix I).[10] To minimize influences from large weights, I stabilized IPTW by replacing 1 in the numerator with a marginal probability of the observed trajectory.[10] The second causal assumption is positivity, which assumes that all study subjects should have positive probabilities of exhibiting all possible trajectories. Extreme IPTW, which are far off from 1, are indicative of nonpositivity.[11] As seen in Appendix II, estimated IPTW was 1 on average with a small standard deviation (i.e., IPTW was tightly distributed around 1), justifying no adjustment to meet the criteria for assuming adequate positivity.[11] The third causal assumption is the stable unit treatment value assumption (SUTVA), which assumes that the outcome of any study subject should depend on the trajectory group originally assigned to him or her, and not be influenced by the trajectory of other study subjects.[12] SUTVA are likely to be violated if some study subjects are geographically clustered such as living in the same shelters.[13] This potential dependency may bias the association between a particular trajectory and mortality. To address potential data dependency and violation of SUTVA, I adjusted for poverty levels of neighborhood of residency using IPTW. Mixed modeling or Generalized Estimation Equation approach was not used in this study because intraclass correlation, a measure of data correlation by four neighborhood poverty groups, was very small.

A marginal structural Cox proportional hazard model was then used to estimate the causal relationship between trajectories of jail incarceration/homelessness and mortality. Using IPTW to create a pseudo-population for which causal assumptions hold (see Appendix I), this model yields the marginal probability of the counterfactual random variables of mortality predicted by trajectory groups.[10] Unlike a conventional regression model, its coefficient of exposure variable

represents causal effects on the entire target population. A sandwich estimator for variance and a corresponding p-value were calculated because it was robust against model misspecification. To reduce potential bias from tied events,[14,15] Efron's approximation method was used.[16]

Missing data and imputation

To reduce potential bias resulting from excluding missing data in the analysis (sex: 1%, race/ethnicity: 1%, nativity: 1% excluding the homelessness-only population; neighborhood poverty: 25% excluding the homelessness-only population), I performed multiple imputations using *IVEware* software that adopted the sequential regression method.[17] Missing nativity and neighborhood poverty data were not imputed for adults who only had shelter use records because nativity information was not collected and neighborhood information was more than 50% missing in NYC shelter registry. Because of limited number of covariates and relatively large amounts of missing data in the neighborhood poverty variable, I tested whether imputation was a reasonable approach for individuals with both jail incarceration and homelessness and those with incarceration-only. From individuals with complete data, 25% was randomly selected and neighborhood poverty information was deleted. I then performed imputation and assessed agreement between actual and imputed neighborhood poverty data for the 25% samples randomly selected *a priori*. The estimated Kappa statistic was greater than the threshold (0.76 > 0.75), justifying imputing missing data (Appendix III).[18] Multiple imputations generated five imputed datasets, and combined results of five estimates that accounted for within- and betweenimputation variability were reported according to Schafer's approach.[19]

Four sensitivity analyses

Because the study did not collect information about behavioral and clinical characteristics associated with mortality such as injecting drug use (IDU), binge drinking, and chronic diseases, causal estimates from marginal structural modeling were potentially biased due to unobserved confounding. To address this issue, the study assessed the extent to which causal estimates might be influenced by bias due to unobserved confounding by performing two sensitivity analyses. The first one used the external adjustment method, which is derived from the equation that the confounded relative risk (RR) = true RR $\frac{\quad}{\quad}$, where P_{C1} = a probability of a binary confounder, C, among exposed, P_{C0} = a probability of C among unexposed, and RR_{CD} = RR between C and an outcome, D.[20] Setting the true RR = 1 and applying estimates from external sources to this formula, bias due to unmeasured confounders can be estimated. In this study, data from Survey of Jail Inmates 2002, the cross-sectional survey of 6,982 sampled inmates representative of the US jail population, provided estimated prevalence of unmeasured confounders (e.g., IDU experiences, binge drinking) and estimated associations between unmeasured confounders and exposure.[21]

The second sensitivity analysis was based on VanderWeele and Arah's bias equation, which is derived under three assumptions: 1) the association between the outcome and unobserved confounders is consistent across all levels of exposure and observed covariates; 2) the unmeasured confounder (U) is binary; 3) the prevalence of U is constant across all levels of observed covariates.[22] These assumptions allowed for estimating bias due to unobserved confounding by the formula: , where γ = association between outcome and U,

a = exposure, and x = measured covariates; otherwise, quantifying unobserved confounding bias would be almost impossible because observation studies often include a large number of covariates that generate many levels.[22] Because U was unknown, varying γ and a ratio of prevalence of U among the exposed over that among the unexposed (δ) were used, and in each level of γ and δ unbiased estimate of causal effect was obtained (= confounded RR / the estimated bias due to unobserved confounding). Since the variance was not affected by bias, I calculated the unbiased estimate of lower bound of confidence intervals using the same method, and examined whether it became below 1 (i.e., not statistically significant) or above 1 (i.e., statistically significant).

Along with unobserved confounders, prior exposure to jail incarceration/homelessness may lead to a biased association between a particular trajectory of these events and mortality. If three-year data were very different from previous years and not representing true trajectories (e.g., brief incarceration during early months in 2001-03 was a continuation of long-term persistent incarceration prior to 2001), low or high mortality risk might have been an effect of prior exposure rather than observed trajectories in 2001-03. In addition, excluding individuals who died during 2001-03 in the cohort might introduce survivor bias. To address these potential bias issues, I performed additional sensitivity analyses by 1) repeating sequence analysis and marginal structural modeling for adults aged 25 years or younger because they were less likely to have prior incarceration/homelessness experiences than older ones, and 2) examining characteristics of those who were excluded due to deaths during 2001-03 and repeating marginal structural modeling using the study cohort data that included early death cases.

All the analyses were performed using SAS 9.2 software (Cary, NC). Statistical significance was established if two sided p-value <0.05.

3.3. Results

During 2004-05, age-adjusted all-cause mortality rate among NYC adults who were both incarcerated and sheltered in 2001-03 was 1,086 per 100,000 person-years (95% Confidence Interval (CI) = 911, 1,288). It was similar to that among homelessness-only population (1,133 per 100,000 person-years, 95% CI = 1,036, 1,238), and higher than incarceration-only population (390 per 100,000 person-years, 95% CI = 347, 437) and non-incarcerated/non-sheltered NYC adults (826 per 100,000 person-years, 95% CI = 816, 837). Adjusted for age, the top four causes of death among those with both incarceration and homelessness included cancer, heart disease, HIV, and drug-related causes (Table 3.1). These were also the leading causes of death among the incarceration-only population, although cause-specific mortality rates were much lower than those among individuals with dual exposures. Compared with these two populations, adults with homelessness only and non-incarcerated/non-sheltered NYC adults were less likely to die of drug-related causes.

3.3.1. Comparisons with non-incarcerated/non-sheltered NYC adults

Compared with non-incarcerated/non-sheltered NYC adults of the same age, sex, race/ethnicity, and neighborhood poverty, incarcerated/sheltered adults with a **Temporary** trajectory had a 1.35 times higher risk of all-cause death (95% CI = 1.14, 1.59), and 4.60 times higher risk of drugrelated death (95% CI = 3.17, 6.46). In addition, the SMR for HIV mortality was 1.54 among those with a **Temporary** trajectory of incarceration and homelessness (95% CI = 1.03, 2.21). All the other trajectory groups in this population with both incarceration and homelessness

were not statistically different from unexposed NYC residents in terms of all-cause and HIV mortality risk.

An elevated risk of drug-related death was found among all trajectory groups except for **Increasingly incarcerated** and **Continuously homeless** patterns (Table 3.2).

Higher all-cause mortality risk was observed in all four trajectory groups of the homelessnessonly population compared to unexposed NYC residents, whereas a lower risk was found among the trajectory groups of incarceration-only population (Table 3.2). Stratified by trajectory groups

these two populations experienced higher risk of drug-related deaths than unexposed NYC residents in 2004-05, whereas none of the groups had an increased risk of HIV mortality.

3.3.2. Comparisons among six incarceration/homelessness trajectory groups

After balancing out differences in baseline covariates across six trajectory groups in the population with both incarceration and homelessness, all-cause mortality risk among adults with a **Temporary** relative to **Continuously homeless** pattern was 1.91 times higher (95% CI = 1.00, 3.68) during the two year follow-up period (Table 3.3). This pattern was also associated with risk of drug-related death and HIV death. Compared with **Continuously homeless** pattern, other trajectories yielded the null relative risk except for the elevated risk of drug-related death in **Decreasingly incarcerated** and **Increasingly homeless** patterns.

3.3.3. Sensitivity analyses

Despite evidence from marginal structural modeling, excess risk of mortality associated with the **Temporary** pattern among the population with both incarceration and homelessness might be due to unobserved confounding such as IDU and binge drinking. The results from sensitivity

analyses in Table 4 show that adjusting for IDU might have moved the estimated relative risk away from the null by 2.75%, whereas bias in the opposite direction was expected if adjusting for binge drinking (bias = 1.95%). In addition, Figure 3.2 illustrates how the lower bound of 95% confidence interval of relative risk for all-cause mortality is affected by adjusting for unobserved confounding. If prevalence of risk behaviors among the unexposed were greater than that among the exposed (i.e., $\delta < 1$), which was consistent with that of observed risk factors in this study (**Temporary** pattern versus **Continuously homeless** pattern), an unbiased estimate of the lower bound of 95% confidence interval would have moved away from 1. Along with sensitivity analyses for unobserved confounders, the study cohort was restricted to adults aged 25 years or younger and all the analyses were repeated. Similar to the main analysis, a majority had **Temporary** pattern in 2001-03. This pattern, as opposed to **Continuously homeless** pattern, was also associated with higher mortality risk, although the estimated association was not statistically significant due to a very small number of deaths.

Lastly, 146 individuals who died during 2001-03 were compared with the study cohort in terms of baseline characteristics and trajectories of incarceration/homelessness. Those who died earlier were older than those retained (on average 46 versus 36 years old), but there were no other systematic differences in baseline demographic and criminal characteristics, and leading causes of death between two groups (e.g., drug-related death: 29% vs. 23%, HIV death: 19% vs. 18%). The sequence analysis of these early death cases identified one trajectory group similar to **Temporary** pattern (N=64 deaths), and the other group (N=20 deaths) characterized by persistent homelessness (Figure 3.3). The remaining two groups (N=62 deaths) did not have sufficient observation time to generate meaningful trajectories; they were characterized by the length of observation time rather than events. After those with valid trajectories (N=84 deaths)

were put back to the study cohort, the marginal structural modeling analysis were repeated. Excess all-cause and HIV mortality risk associated with **Temporary** pattern were consistently found. However, the association between trajectory groups and risk of drug-related death was attenuated and no longer statistically significant, although the magnitude of drug-related mortality risk was still the highest among **Temporary** pattern.

3.4. Discussion

In the retrospective cohort study of incarcerated/sheltered NYC adults, sporadic exposure to brief jail incarceration and homelessness (**Temporary** pattern) was associated with excess risk of allcause, drug-related, and HIV deaths during a two year follow-up period. This elevated mortality risk was consistently found when compared with non-incarcerated/non-sheltered NYC adults as well as those with **Continuously homeless** pattern. In particular, NYC adults with this **Temporary** pattern were five times more likely to die of drug-related causes than unexposed NYC residents of the same age, sex, race/ethnicity, and neighborhood poverty. Excess risk of drug-related deaths was also observed in the other trajectory groups except for **Increasingly incarcerated** and **Continuously homeless** patterns, whereas all-cause and HIV mortality risk was not associated with trajectory groups other than **Temporary** pattern.

Compared with non-incarcerated/non-sheltered NYC adults, all-cause mortality risk was greater among those with homelessness-only, and smaller among those with incarceration-only according to SMR analysis. These findings were consistent with existing evidence from previous studies that homelessness was an independent mortality risk factor in the United Kingdom[5] and time at prison or jail was related with lower risk of age-adjusted all-cause mortality among prisoners or jail inmates as opposed to the US general population.[23,24] In general, the SMR was greater among the incarceration and homelessness population with **Temporary** pattern, as

opposed to incarceration-only or homelessness-only populations. However, pairwise comparisons of SMR between different populations should be made with caution because SMR inference was specific to each population (i.e., the reference population served as counterfactual of the exposed population) and a limited number of confounders were accounted for. For example, a relatively high observed SMR among the homelessness-only population relative to the other populations may reflect residual confounding associated with their older ages or other unmeasured residual confounding that influences the observed homelessness-mortality association.

Excess risk of all-cause mortality among ever-incarcerated and ever-sheltered individuals with **Temporary** pattern, especially as opposed to those with **Continuously homeless** pattern, may point to health burdens attributed to the revolving door pattern. Two methods were employed to assess whether this observation was potentially the result of an artifact of confounding, including IPTW and sensitivity analyses. Both results ascertained causal assumptions and suggested that the observed association was unlikely to be an artifact of confounding, strengthening this inference. One possible mechanism is disruption of medical care due to transitions from brief jail incarceration or homelessness to community-dwelling, which may also explain the association between **Temporary** pattern and high HIV mortality risk because continuity of antiretroviral care is critical for survival among people living with HIV/AIDS.[25] In contrast, for those with trajectories of persistent homelessness or incarceration relative to the **Temporary** pattern, essential medical care is less frequently to be disrupted or exposed to hazardous environments in the community (e.g., drug intake) for at least two-year follow-up period. Another possible explanation for the **Temporary** pattern-mortality association is that frequent releases from jail

may increase a chance for drug overdose as abstinence during jail stay decreases drug tolerance.[26] This mechanism has been supported by evidence of excess risk of drug-related death in the previous US and United Kingdom studies.[2,27,28] Yet, another sensitivity analysis examined possible survivor bias by taking into account early death cases that were excluded, and revealed that excess risk of drug-related death associated with the **Temporary** pattern in the current study was less apparent. Extensive discussion on this finding can be found in the following limitations section. Lastly, some researchers attribute excess mortality risk associated with incarceration or homelessness as cumulative stresses,[3,5] but this explanation seems less convincing than the others given the similar sensitivity analysis finding among the cohort aged 25 years or younger, the short observation time, and lack of data about differential stress levels across trajectory groups.

All trajectory groups except for **Increasingly incarcerated** and **Continuously homelessness** patterns were associated with risk of drug-related death, compared with unexposed NYC residents. Incarceration during later time or consistent shelter stays throughout 2001-03 were more likely to remain incarcerated or sheltered during subsequent two years than other trajectories, which might decrease circumstances to use drugs. Unlike drug-related death, risk of HIV death was not elevated among NYC adults who had incarceration/homelessness sustained for certain time points. During uninterrupted stays, they might benefit from medical services or referrals offered in shelters or jail. Yet, more data about availability and delivery of services for NYC jail inmates or shelter users with HIV/AIDS are warranted to test this hypothesis.

This study has some limitations. First, only aggregate data were available for nonincarcerated/non-sheltered NYC adults. As mentioned earlier, inference from the SMR analysis should thus be made with caution because relative risk could be biased due to residual

confounding beyond age, sex, race/ethnicity, and neighborhood poverty. Second, similar to measurement error pertaining to the exposure variable in the Chapter 2, death outcomes were likely to be underestimated because deaths outside of NYC (e.g., about 6.5% of annual deaths among NYC residents according to National Center for Health Statistics) were not captured. This is likely to bias the estimated association toward the null under the assumption that measurement error is independent of trajectory groups. Third, even though bias due to unobserved confounding due to certain measures was examined via sensitivity analyses, there might be other sources of undetected confounding that moves the relative risk toward the null. Fourth, because individuals who died during 2001-03 in the cohort were excluded, the estimated RR might be affected by survivor bias. Even if causes of death and baseline characteristics were similar between those who died earlier and those retained, the sensitive analysis showed that the relationship between trajectory groups and drug-related mortality became attenuated and nonsignificant after adding early death cases. With survivor bias, the mortality rate among the unexposed is usually inflated because the exposed is required to survive to receive a treatment such as drugs or surgical procedures; as a result, biased RR is smaller than true one.[29] In this study, the opposite occurred. After early death cases were re-added to the cohort (i.e., potential survivor bias was accounted for), age-adjusted drug-related mortality among **Temporary** pattern (the exposed) increased two fold, whereas **Continuously homeless** individuals (the unexposed) experienced five-fold increase. This may reflect the younger ages of early drug-related deaths among the unexposed, or the study design that actual treatment was not provided to the exposed. Longer follow-up time is required to determine presence of survivor bias because 1) the sensitivity analysis result is based on a very small number of drug-related deaths (e.g., death count increased from one to three when early deaths were added to the **Continuously homeless** group); 2) trajectory grouping may

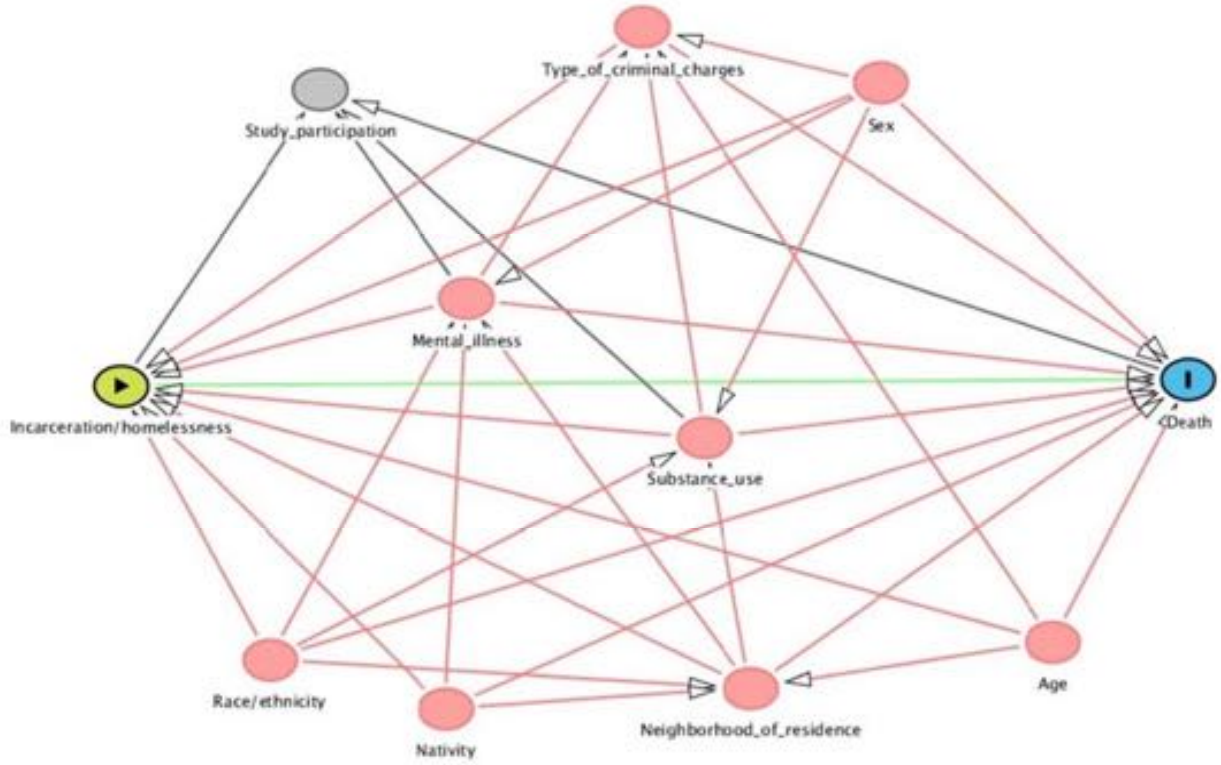
not be reliable among early deaths (e.g. 84 early deaths had two-year exposure time on average, and one extra year would be a sufficient time to have their
trajectory group membership changed). Lastly, two years may not be a sufficient time to assess mortality risk due to chronic diseases. Long-term health impacts of some trajectories other than the revolving door pattern may be different from those observed for two immediate years.

Despite these limitations, the study has some important strengths. First, by linking various trajectories of incarceration/homelessness and mortality outcomes, this study assessed mortality risk associated with complex transitions among jail incarceration, homelessness, and communitydwelling. In particular, this allowed us to empirically test the structural exposure perspective that the revolving door pattern contributes to adverse health conditions. Second, the study explicitly tested and adopted analytic methods to establish causal assumptions from analysis of administrative data. While causal inference from observational data is fraught with methodological challenges, these techniques improve the internal validity of measuring the unique health burdens associated with longitudinal exposure to jail incarceration/homelessness beyond individual-level risk factors.

In conclusion, longitudinal exposure to incarceration and homelessness in 2001-03 was independently associated with mortality risk during two year follow-up period among NYC adults. In particular, those with sporadic exposure to brief incarceration and homelessness experienced excess risk of all-cause, drug-related, and HIV deaths. It implies that life disruption due to brief exposure to these events exerts negative health impacts, providing important evidence for the structural exposure approach. This finding suggests targeting a group of

individuals based on patterns of incarceration/homelessness for public health interventions to prevent them from cycling through jails and homeless shelters and promote community linkage programs for continuity of care.

Figure 3.1. Directed Acyclic Graph for causal relationship between being exposed to both incarceration and homelessness and all-cause mortality



Notes: Green line = causal path, red line: biasing path, green circle = exposure, blue circle =

outcome, red circle = common cause of exposure and outcome, grey circle = common effect of exposure and outcome.

Table 3.1.Age-adjusted mortality rates per 100,000 person-years (95% Confidence Interval) in 2004-05 among 194,536 adults who were incarcerated in New York City jail or sheltered in New York City single adult homeless shelter during 2001-03

New York City	Total study	Incarceration & homelessness	Incarceration only	Homelessness adults† only	population
All-cause mortality rates per 100,000 in 2004-05	826 (816,837)	840 (785,897)	1,086 (911,1288)	390 (347,437)	1,133 (1036,1238)
Specific causes of death					
Malignant neoplasms	222 (216,227)	179 (153,208)	238 (154,353)	55 (38,76)	279 (230,334)
Diseases of heart	302 (296,308)	162 (138,190)	177 (108,276)	68 (50,92)	234 (190,285)
Human Immunodeficiency virus disease	23 (22,25)	111 (93,132)	150 (94,233)	79 (62,101)	104 (77,138)
Drug-related	14 (13,15)	96 (79,115)	174 (115,258)	72 (54,93)	77 (55,106)
Other	93 (90,97)	80 (63,99)	106 (57,185)	17 (9,30)	143 (110,183)
Viral Hepatitis	6 (6,7)	26 (17,39)	44 (14,108)	11 (5,23)	32 (17,55)
Assault (homicide)	9 (8,10)	25 (19,34)	21 (10,59)	31 (22,44)	4 (1,15)
Influenza and pneumonia	39 (36,41)	25 (16,37)	2 (0,39)	6 (2,16)	47 (28,73)
Mental disorders due to use of alcohol	5 (4,6)	23 (15,35)	38 (11,96)	4 (1,13)	40 (23,64)

Chronic liver disease and cirrhosis	8 (7,9)	22 (14,34)	14 (1,60)	11 (4,22)	34 (19,56)
Chronic lower respiratory diseases	24 (23,26)	22 (13,33)	20 (3,73)	8 (3,19)	32 (17,55)
Diabetes Mellitus	28 (26,30)	21 (13,31)	6 (1,42)	1 (0,7)	49 (31,75)
Accidents except drug poisoning	16 (15,18)	14 (9,23)	40 (13,98)	11 (5,22)	8 (3,21)
Undetermined intent	3 (3,4)	14 (8,23)	26 (6,79)	7 (3,17)	16 (6,33)
Cerebrovascular disease	26 (24,28)	14 (8,23)	16 (2,62)	6 (2,14)	19 (8,38)
Intentional self-harm (suicide)	8 (7,9)	8 (4,14)	14 (3,54)	3 (2,9)	16 (7,31)

Notes:[†]number represents mortality rates among non-incarcerated/non-sheltered NYC residents.
Direct standardization was used to adjust mortality rates according to the age distribution of US adult population in US census 2000.

Table 3.2. Observed number of deaths and standardized mortality ratios by incarceration/homelessness trajectory groups among 194,536 incarcerated/sheltered adults, New York City, 2004-05

	All-cause death			Drug-related death			HIV death		
	No. of deaths	**SMR†**		**No. of deaths**	**SMR†**		**No. of deaths**		
	1360	**0.19**		213	**0.65**		234		
			95% CI			**95% CI**		**SMR†**	**95% CI**
Total			**0.18,0.20**			**0.56,0.74**		0.30	0.26,0.34
Incarceration & homelessness									
Temporary	144	**1.35**	**1.14,1.59**	33	**4.60**	**3.17,6.46**	29	**1.54**	**1.03,2.21**
Increasingly incarcerated	12	0.80	0.41,1.40	2	1.95	0.24,7.04	3	1.06	0.22,3.10
Decreasingly incarcerated	18	1.23	0.73,1.94	4	**4.00**	**1.09,10.25**	4	1.46	0.40,3.74
Increasingly homeless	20	0.81	0.49,1.25	6	**3.62**	**1.33,7.87**	2	0.46	0.06,1.66
Decreasingly homeless	18	1.24	0.73,1.96	5	**5.10**	**1.66,11.91**	2	0.77	0.09,2.79
Continuously homeless	11	0.93	0.47,1.67	1	1.29	0.03,7.20	0		
Incarceration-only									
Temporary	380	**0.46**	**0.42,0.51**	66	1.25	0.96,1.58	92	**0.73**	**0.59,0.89**
Decreasingly incarcerated	65	**0.52**	**0.40,0.66**	13	1.58	0.84,2.70	16	0.78	0.45,1.27
Increasingly incarcerated	87	**0.68**	**0.54,0.84**	20	**2.37**	**1.45,3.66**	20	0.96	0.58,1.48
Continuously incarcerated	53	**0.50**	**0.38,0.66**	16	**2.31**	**1.32,3.75**	9	**0.51**	**0.23,0.98**
Homelessness-only									
Temporary	267	**1.20**	**1.06,1.35**	23	**2.08**	**1.32,3.12**	35	1.34	0.93,1.86
Decreasingly homeless	107	**1.23**	**1.01,1.49**	5	1.31	0.43,3.07	12	1.25	0.65,2.19
Increasingly homeless	83	**1.29**	**1.03,1.60**	8	**2.38**	**1.03,4.69**	5	0.59	0.19,1.39

Continuously homeless	95	**1.34**	**1.08,1.64**	11	**3.29**	**1.64,5.88**	5	0.60	0.19,1.40

Abbreviations: CI, confidence interval; SMR, standardized mortality ratio.
Notes: Numbers in bold indicate statistical significance at $p < 0.05$.
†SMR among trajectory groups compared with non-incarcerated/non-sheltered New York City residents, accounting for age, sex, race/ethnicity, and neighborhood poverty.

Table 3.3. Relative risk from marginal structural cox proportional hazard regression for all-cause, drug-related, and HIV mortality rates by incarceration/homelessness trajectory groups among 15,620 adults with both jail incarceration and homelessness experiences, New York City, 200405

Trajectory groups	All-cause death		Drug-related death		HIV death[b]	
	RR	95% CI	RR	95% CI[c]	RR	95% CI
Temporary	**1.91**	**1.00, 3.68**	**7.80**	**1.07, 56.86**	**3.32**	**1.14, 9.67**
Increasingly incarcerated	1.21	0.49, 2.98	3.52	0.32, 38.75	3.41	0.95, 12.28
Decreasingly incarcerated	1.99	0.88, 4.53	**9.86**	**1.00, 97.30**		
Increasingly homeless	1.27	0.58, 2.78	7.58	0.90, 63.60		
Decreasingly homeless	1.88	0.86, 4.14	**8.90**	**1.04, 76.22**	Reference	
Continuously homeless	Reference		Reference			

Abbreviations: CI, confidence interval; RR, relative risk.

Notes: Numbers in bold indicate statistical significance at $p < 0.05$.
Inverse probability of treatment weight was used to control for bias due to confounding. Potential confounders included age, sex, race/ethnicity, nativity, neighborhood poverty, a proxy measure of substance use, a proxy measure of mental illness, criminal charges due to drug sales, violent crimes, weapon possession, public administration, property crimes, quality of life crimes, and sex crimes.

[b] Due to zero HIV cases in the Continuously homeless pattern, three trajectories of homelessness (Increasingly, Decreasingly, and Continuously homeless patterns) and two trajectories of incarceration (Increasingly, and Decreasingly incarcerated patterns) were collapsed into homelessness and incarceration groups, respectively.

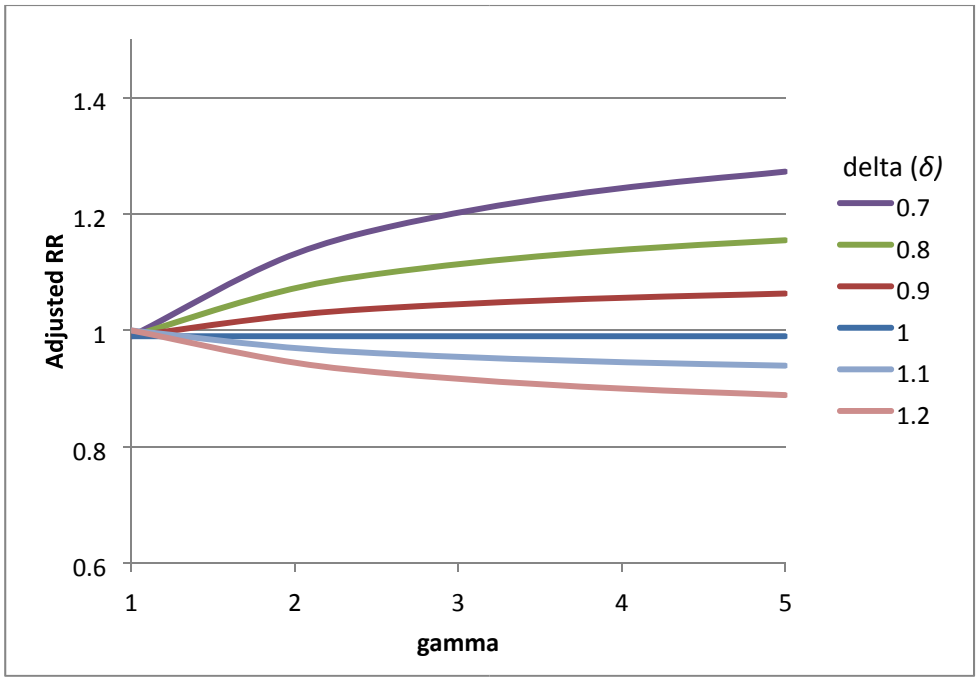
[c] Wide confidence intervals reflect small number of outcome cases. As seen in Table 2, one drugrelated death occurred among individuals with the Continuously homeless pattern, which was used as a reference group.

Table 3.4. External adjustment for all-cause mortality and the revolving door pattern among 15,620 adults with jail incarceration and homelessness, New York City, 2004-05

	RR_{CD}	P_C	OR_{EC}	True RR_{ED}	P_E	Apparent RR_{ED}	% bias
Binge drinking	1.40	0.49	1.26	1.00	0.69	1.02	1.95
IDU	4.20	0.27	0.92	1.00	0.69	0.97	-2.79

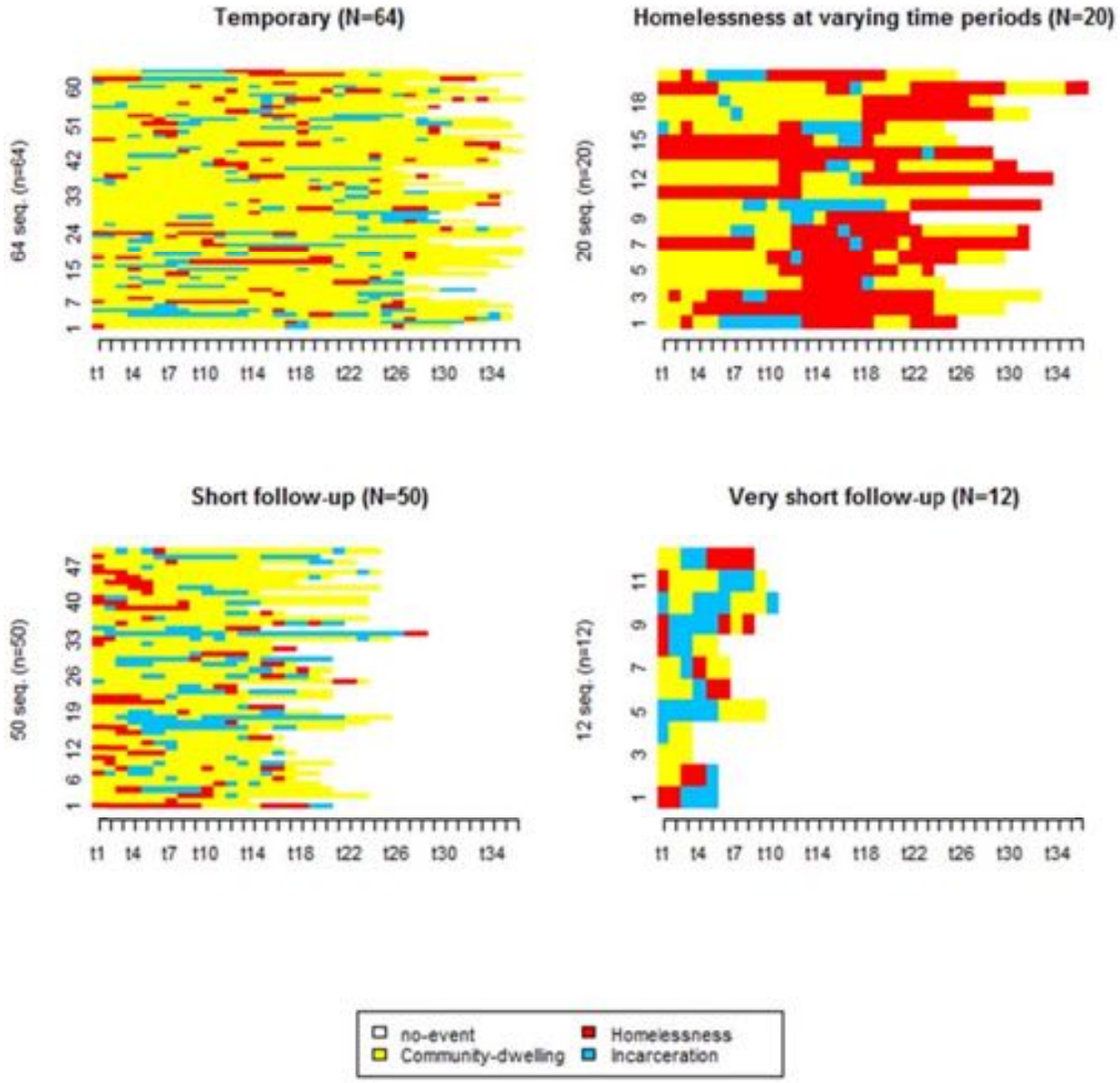
Notes: Because there was no existing study that measures the revolving door pattern of jail incarceration and homelessness, I defined exposure as having both jail incarceration and homelessness experiences among participants of Survey of Jail inmates, 2002. To be consistent with the reference group in the current study (continuously homeless pattern), I defined nonexposure as having previous and current homelessness experiences among jail inmates. RR_{CD} = relative risk between confounder and outcome (source: evidence from the literature), P_C = prevalence of confounder in the study population that consists of jail inmates with homelessness experiences (source: Survey of Jail inmates, 2002), OR_{EC} = association between confounder and exposure (source: Survey of Jail inmates, 2002), P_E = prevalence of exposure in the study population (source: Survey of Jail inmates, 2002), Apparent RR_{ED} = confounded relative risk of all-cause mortality by the revolving door pattern.

Figure 3.2. Estimated lower bound of 95% confidence intervals of relative risk for all-cause mortality by the revolving door pattern adjusted for an unobserved confounder (*U*) among 15,620 adults with jail incarceration and homelessness, New York City, 2004-05



Abbreviations: CI, confidence interval.
Notes: the lower bound of 95% CI of relative risk of all-cause mortality by the revolving door pattern was 1.00 from Table 3. $P(U=1|a=1,x)$ was arbitrarily set as 0.5.
U = unmeasured confounder; $\delta = P(U=1|a=1, x) / P(U=1|a=0,x)$; $\gamma = RR$ of all-cause mortality by U.
Key parameters are comparable between this approach and external adjustment (Table 3) such that $U=P_C$, $\delta \approx OR_{EC}$, $\gamma = RR_{CD}$.

Figure 3.3. Four non-overlapping groups of jail incarceration/homelessness trajectories according to sequence analysis among 146 New York City adults with both jail incarceration and homelessness who died during 2001-03 and were excluded from the study cohort



Chapter 4. Three-year trajectories of jail incarceration and homelessness and their association with retention in HIV care and viral suppression among incarcerated/sheltered New York City adults living with HIV/AIDS

4.1. Introduction

Maintaining adequate HIV medical care is a critical component of survival for people living with HIV/AIDS (PLWHA).[1,2] Housing stability has been considered to be one of the important determinants of retention in essential HIV medical care and viral suppression because it helps PLWHA adhere to routines such as making regular visits to doctors and taking antiretroviral medications.[3] Housing stability may also provide intangible resources such as a stronger social network and sense of identity, which may motivate individuals to avoid risk behaviors and follow treatments to maintain health.[3] Empirical evidence to support this relationship has been documented among PLWHA with histories of homelessness. For example, according to selfreported longitudinal data from a representative sample of NYC PLWHA, receiving assistance for housing problems was positively associated with higher odds of appropriate HIV medical care.[4] Similarly, several studies have reported higher likelihood of adherence to antiretroviral treatment among stably-housed PLWHA versus their homeless counterparts.[5-7] However, despite high prevalence of HIV among the incarcerated population in the US, this association has rarely been tested among incarcerated PLWHA; current evidence is mainly concentrated on disrupted HIV care post release.[8-10] Because incarceration is strongly correlated with homelessness, and because experiences of both events affect housing stability, it is important to take into account dynamic aspects of incarceration events along with homelessness to improve validity of the housing stability-continuity of HIV care association. The purpose of this analysis was to examine whether retention and quality of HIV care was associated with different patterns of incarceration/homelessness among NYC PLWHA with recent experiences of both jail incarceration and homelessness, using a measure that captures timing and sequencing of

jail incarceration and homelessness from sequence analysis. Specifically, the study tested the hypothesis that frequent transitions between incarceration and homelessness, which suggests greater housing instability, are associated with lower likelihood of retention in HIV care.

4.2. Methods

4.2.1. Samples

The study population included 1,173 NYC adults who were diagnosed with HIV/AIDS and spent at least one night in both NYC jail and NYC single adult homeless shelters during 2001-03. The combined administrative data from NYC jail and NYC single adult shelter registries provided jail incarceration/shelter use records and baseline demographic and criminal information. From the matched NYC HIV surveillance registry, data about HIV/AIDS diagnoses, viral loads, and CD4 counts were obtained for this cohort. The comparison group comprised of nonincarcerated/non-sheltered NYC PLWHA who were diagnosed and alive prior to 2004 from the NYC HIV surveillance registry.

According to a New York State regulation, all viral load and CD4 test results should be reported as of June 1, 2005, an expansion of the previous law that required reporting of only detectable viral load results. This mandatory reporting law has been effective in almost completely capturing HIV laboratory test results in NYC.[11] Because undetectable viral load results (50 copies/ml or less) were missing in the NYC HIV surveillance data before this regulation, the study used the one-year period between June 2005 and June 2006, as opposed to 2004-05 years, to obtain HIV care outcomes.

4.2.2. Study variables

Two primary outcome variables were examined in this analysis: (1) retention in HIV medical care and (2) viral load suppression.[2] Retention in HIV medical care was established if there were at least two viral load or CD4 tests during June 2005-June 2006, which were ≥90 days apart.[1] Viral load suppression was defined as being achieved if there was at least one record with a viral load of <400 copies/ml during the 12-month period.[2] The viral load suppression outcome was calculated only for those with viral load test results (N= 698).

The exposure variable was defined using group-based trajectories of jail incarceration/homelessness. In NYC, PLWHA experiencing homelessness have a legal right to obtain permanent housing and rental assistance through the NYC HIV/AIDS Services Administration. Instead of using trajectory groups from Chapter 2, I re-ran sequence analysis to identify trajectories that might be unique to NYC PLWHA with recent jail incarceration and homelessness that represented 8% of the original cohort, which could have been collapsed within more general patterns in the study cohort. Detailed analytic steps of sequence analysis were described in the method section of Chapter 2. Potential confounders for exposure-outcome association were identified by constructing a DAG specific for this analysis.[12] These included baseline demographic (age, sex, race/ethnicity, neighborhood poverty) and behavioral characteristics (proxy substance use), type of criminal charges, proxy prior mental health conditions, age of HIV diagnoses, and stage of HIV infection (HIV or AIDS). Similar to the mortality analysis in Chapter 3, to be eligible for this analysis, one had to survive after 2001-03 to be included in the study cohort, and censoring death cases could potentially act as a collider.

However, this potential bias was unlikely because no actual death in the study cohort occurred during 2001-03 according to a review of the NYC HIV surveillance registry data. A small number of deaths were identified during the follow-up time and these were reflected in the person-years calculation. For deaths, the midpoint of the year of death (e.g., July 1, 2004) was assigned, or 0.5 person-years for deaths in 2004 (N=33), and 1.5 person-years for deaths in 2005 (N=41), while 2.5 person-years were assigned to those who survived during the follow-up period or died in 2006.

4.2.3. Statistical analysis

First, descriptive statistics of baseline characteristics and HIV care outcomes were summarized across trajectory groups of incarceration and homelessness. Bivariate association between each of these characteristics and trajectory groups were evaluated using chi-square test for categorical variables or independent t-test with bonferroni adjustment for continuous variables. Then, marginal structural log-linear Poisson regression analysis with an offset of person-years was performed to estimate adjusted relationships between trajectories of jail incarceration/homelessness and HIV care outcomes. As described in Chapter 3, a stabilized inverse probability of treatment weight (IPTW) was derived from a propensity score model using trajectory groups (dependent variable) and baseline demographic, behavioral, and criminal characteristics (independent variables). Estimates from marginal structural modeling were weighted using IPTW, ensuring that weighted data met the assumptions for exchangeability (balanced baseline characteristics across trajectory groups; Appendix IV), positivity (tightly distributed IPTW with one as a mean value; Appendix V), and stable unit treatment value

(adjusting for poverty levels of neighborhood residency to address potential data dependency among some study subjects).[13-15] A sandwich estimator for variance and a corresponding p-value were calculated because it was robust against model misspecification.[14]

Missing data and imputation

Multiple imputations via *IVEware* software[16] were performed to address missing data using the whole study population (sex, race/ethnicity: 1% missing, nativity: 1% missing excluding homelessness-only population; neighborhood poverty: 25% missing excluding homelessnessonly population), which generated five imputed datasets. A subset of PLWHA was then recreated and combined results of five estimates were reported according to Schafer's approach, which accounts for within- and between-imputation variability.[17]

Sensitivity analyses

Because the study did not collect information about behavioral and clinical characteristics associated with retention in HIV care or viral suppression (e.g., IDU), causal estimates from marginal structural modeling were potentially biased due to unobserved confounding. To address this issue, the study assessed the extent to which causal estimates might be influenced by bias due to unobserved confounding by performing the sensitivity analysis proposed by VanderWeele and Arah.[18] However, unlike Chapter 3, the external adjustment method could not be used because of lack of existing public data that represented the population with both HIV/AIDS and jail incarceration/homelessness in the US.[19]

Along with the sensitivity analysis for unobserved confounding, all the analyses were repeated using NYC PLWHA with homelessness-only and those with incarceration-only. Because NYC PLWHA staying at shelters during 2001-03 were likely to receive housing assistances and benefits through effective NYC DHS referral system to HIV/AIDS Services Administration (i.e., immediately referring self-identified PLWHA to emergency single room occupancy units),[20] a particular trajectory of homelessness might also represent differential housing instability; associations between trajectories and continuity of HIV care among those with both incarceration and homelessness would be replicated in this population. For NYC PLWHA incarcerated or recently released from NYC jails, various housing services were also available. Yet, transition from jail to the housing was reported to be less organized and effective than that from shelters during 2001-03,[21] which could generate a unique association between trajectories of incarceration and continuity of HIV care.

All the analyses except for sequence analysis (R 2.14.2) and imputation (*IVEware*) were performed using SAS 9.2 software (Cary, NC). Statistical significance was established if two sided p-value <0.05.

4.3. Results

The majority of 1,173 individuals living with HIV/AIDS who were incarcerated in NYC jail and spent at least one night at NYC single adult shelter during 2001-03 were male (84%), aged 18-44 years (82%), and non-Hispanic black or Hispanic (95%) (Table 4.1). This population, compared with non-incarcerated/non-sheltered NYC PLWHA, was disproportionately male (84% vs. 69%) and non-Hispanic black (65% vs. 45%). In contrast, the percent of non-Hispanic whites (4% vs.

21%) and residents living in the medium poverty neighborhood (14% vs. 29%) was much smaller in the study cohort relative to non-incarcerated/non-sheltered NYC PLWHA, while age distribution and stage of HIV infection were similar between two groups.

Figure 4.1 shows that jail incarceration and homelessness events over 2001-03 were best represented by five unique trajectories, and this cluster solution was determined to be optimal (Table 4.2). Among 1,173 PLWHA experiencing both jail incarceration and homelessness in 2001-03, 67% (N=782; **Temporary**) had sporadic experiences of brief jail incarceration and shelter stays over three years. About 13% of the study cohort exhibited trajectories characterized by shelter use patterns; one group spent extensive amounts of time in shelters (average 456 days) without much interruption, classified as **Continuously homeless** pattern (N=93), and the other had continuous shelter stays during earlier months followed by community-dwelling (**Decreasingly homeless**; N=56). The last two trajectory patterns included adults who were increasingly incarcerated during later months (**Increasingly incarcerated**; N=116) and those who had early incarceration events, followed by community-dwelling with sporadic incarceration (**Decreasingly incarcerated;** N=126).

Individuals with **Continuously homeless** pattern were older than those in other groups, while those with **Decreasingly incarcerated** pattern had a greater proportion of females (Table 4.1). Race/ethnicity, nativity, and neighborhood poverty appeared to be independent of trajectory groups. Approximately half of the study cohort across all trajectory groups had an indication of substance use, while prevalence of serious mental illness was highest in the **Continuously homeless** group. Individuals charged with drug possession, drug sales, property, and violent

crimes were more likely to exhibit the **Increasingly incarcerated** trajectory compared to those with other criminal charges. Age at HIV diagnoses and stage of HIV infection were similar across trajectory groups.

Among the study cohort, 48% had at least two HIV lab tests for viral load or CD4 counts, which were three months or greater apart during one-year follow-up time (Table 4.3). Prevalence of successful retention in HIV care was similar across all trajectory groups, ranging from 44% to 52%. When non-incarcerated/non-sheltered NYC PLWHA who were diagnosed with HIV and survived prior to 2004 were examined as a comparison group, a similar pattern was identified: 50% experienced retention in HIV care. During June 2005-June 2006, about 50% of the study cohort had viral load tests reported to the NYC HIV registry. Of these, 47% experienced viral suppression; prevalence of viral suppression was highest among individuals who stayed in shelters during the early months and dwelled in the community afterwards (**Decreasingly homeless**). During the same period, higher prevalence of viral suppression was observed among non-incarcerated/non-homeless NYC PLWHA (66%).

The marginal structural regression analysis shows that trajectories of jail incarceration and homelessness in 2001-03 were not significantly associated with prevalence of HIV care retention in June 2005-June 2006 (Table 4.4). Among NYC PLWHA who had viral load records and recent histories of jail incarceration and homelessness, those with **Temporary** relative to **Decreasingly homeless** patterns had 0.71 times lower prevalence of viral suppression during the same one-year period (95% Confidence Interval (CI) = 0.54, 0.93).

Results from the sensitivity analysis in Figure 4.2 show how the upper bound of 95% CI for the prevalence ratio for viral suppression could be affected by adjusting for unobserved confounding. As long as association between unobserved behaviors and viral suppression were greater than 1, $\delta > 1$ (i. e. , prevalence of unobserved behaviors among individuals with **Temporary** pattern is higher than that among those with **Decreasingly homeless** pattern) would have moved the upper bound of 95% CI away from 1. On the other hand, if particular behaviors among individuals with **Temporary** relative to **Decreasingly homeless** patterns were 20% less prevalent ($\delta = 0.8$) and association between these unobserved behaviors and viral suppression were strong ($PR \geq 2$ or $\gamma \geq 2$), the estimated prevalence ratio would have been insignificant.

Another sensitivity analysis showed that each of incarceration-only and homelessness-only populations with HIV/AIDS had four unique trajectories similar to those among the whole populations (Figure 4.3; Figures 2.3 and 2.4 in Chapter 2). Overall 45% of these two populations, similar to that of the study cohort, experienced retention in HIV care during the one-year followup time. Of those with any viral records, 48% (incarceration-only) and 54% (homelessness-only) had at least one lab test result of viral suppression (Table 4.5). The marginal structural regression analysis showed that among homelessness-only PLWHA the **Temporary** relative to **Decreasingly homeless** patterns had 0.77 times lower prevalence of retention in care during the same one-year period (95% CI = 0.65, 0.90; Table 4.6). In contrast, the **Temporary** pattern of incarceration in 2001-03, as opposed to the **Decreasingly incarcerated** pattern, was significantly associated with higher prevalence of HIV care retention among incarceration-only PLWHA (Table 4.7). Unlike the study cohort, prevalence of viral suppression was not associated with trajectories among the incarceration-only and homelessness-only populations.

4.4. Discussion

In this study, almost half of NYC adults living with HIV/AIDS who were sheltered and incarcerated in 2001-03 experienced retention in care during the one-year follow-up period. This percentage was similar between the incarcerated/homeless study cohort and nonincarcerated/non-sheltered NYC PLWHA who were diagnosed and alive prior to 2004. Unlike retention in HIV care, however, overall prevalence of viral suppression among those with viral load records was much lower among the incarcerated/homeless study cohort relative to nonincarcerated/non-sheltered NYC PLWHA, indicating relatively poor adherence to HIV treatment in the study population.

Similar to the finding in Chapter 2, a majority of the study cohort experienced brief bouts of jail incarceration and homelessness in 2001-03, and a minority was more consistently incarcerated or sheltered throughout the period of early or late months. Those who sporadically experienced brief jail incarceration and homelessness in 2001-03 were less likely to experience viral suppression during the one-year follow-up period compared with those who left homeless shelters during early months and persistently stayed in the community, whereas trajectory groups were independent of retention in HIV care.

The null association between trajectories of incarceration/homelessness and retention in HIV care did not support the hypothesis that frequent transitions of short-term jail incarceration and homelessness are associated with lower likelihood of continuity of care than a pattern of

persistent homelessness or incarceration. This lack of variability, coupled with similar prevalence of retention in care between the study cohort and non-incarcerated/non-sheltered

NYC PLWHA, implies that those with incarceration and homeless events were able to receive HIV care with recommended intervals. Since affordable HIV medical services and various social services were widely available through the Ryan White program and promoted in NYC neighborhoods, jails, and homeless shelters, experiencing life disruption due to jail incarceration and homelessness might not act as a barrier to making medical visits for those connected to care.[11]

Unlike retention in care, prevalence of viral suppression significantly differed by trajectories of incarceration and homelessness. This implies that adequate adherence to treatment might be worse among a group of PLWHA with sporadic exposure to brief jail incarceration and homelessness, compared with those who left shelters during early months and persistently stayed in the community afterwards. Given that access to permanent housing and services was available to NYC PLWHA, this positive finding among the reference group might result from effective case management that assisted them in adhering to HIV treatment regimens, which has previously been found beneficial.[4] Another possible mechanism is that being persistently out of shelter and jail is indicative of housing stability, creating a positive psychological influence on following medical treatments.[3] Data about housing and case services are warranted to test which mechanism is more probable.

The study finding supported the earlier interpretation that excess risk of HIV mortality associated with **Temporary** pattern is a manifestation of disruptions to HIV treatment due to transitions

between jails and shelters. In the current study, viral suppression may act as a mediator of the **Temporary** pattern-HIV mortality association. Sporadic experiences of brief jail incarceration and homelessness, as opposed to undisrupted community-dwelling, may contribute to elevating HIV mortality risk among NYC PLWHA with recent incarceration and homelessness by creating environments where essential HIV cares and adherence get disrupted. Future studies that link mortality data with HIV surveillance registry data are warranted to further explore and test mechanisms that explain excess HIV mortality risk associated with a pattern of sporadic exposure to brief jail incarceration and homelessness.

The sensitivity analysis showed that the overall association between trajectory groups and HIV continuity of care outcomes among the study cohort was not replicated in incarceration-only and homelessness-only PLWHA. While we observed no association between trajectories groups and retention in care among those in the main cohort, homelessness-only PLWHA who initially stayed in shelters then remained shelter-free (**Decreasingly homeless** pattern), compared with those with **Temporary** pattern, were more likely to be retained in care. In contrast, incarceration-only PLWHA with **Decreasingly incarcerated** pattern was least likely to have HIV care retained. It is possible that homelessness-only PLWHA who left shelters after brief stays, as opposed to prolonged stays, are less likely to get connected to the well-established housing services/programs.[20] For incarceration-only PLWHA, as a recent paper pointed out,[21] transition to stable community-dwelling from jail stays appeared to be more challenging than that among homelessness-only PLWHA during early 2000s, which could disrupt continuity of HIV care. For the main cohort, the null finding implies that staying in two different institutions increases chances for lab tests. In addition, unlike the main finding where prevalence of viral suppression

significantly differed by trajectories, viral suppression was not associated with homelessness or incarceration patterns in these populations. Proportions of incarceration-only (44%-58%) and homelessness-only PLWHA with any viral load records (59%-61%) were smaller than those in the main study cohort (58%-73%). Lack of variability of viral suppression experiences in these populations, coupled with these lower percent of having any viral load records, might reflect selection bias towards those with a high likelihood of adhering to HIV treatment. More detailed baseline data are warranted to test evidence of this selection bias.

This study has some limitations. First, there were limited data about demographic, behavioral, and clinical characteristics of PLWHA who were both incarcerated and sheltered. Individuals with **Temporary** pattern may be more likely to have high risk profiles than those with **Decreasingly homeless** pattern, or high risk profiles may be less prevalent among those with **Temporary** relative to **Decreasingly homeless** patterns. Depending on the direction of unobserved confounding between these patterns, the relationship between viral suppression and **Temporary** pattern could be biased either toward or away from the null, as seen in the sensitivity analysis. For example, suppose that 50% of individuals with **Temporary** pattern are non-injecting drug users. If the percent of non-injecting drug users among **Decreasingly homeless** individuals were 63% and non-injecting drug users were two times or higher more likely to experience viral suppression, **Temporary** versus **Decreasingly homeless** pattern would have been no longer significantly associated with viral suppression. Second, data about housing and housing services were not collected. Even though homeless PLWHA in NYC have a legal right to be housed, being out of shelter and jail does not necessarily mean being stably housed in the community. Lastly, viral suppression was defined as <400 copies/ml, which is different from a

current US Department Health and Human Services guideline (≤ 200 copies/ml).[22] Due to confidential concerns, raw viral suppression records were not provided and were dichotomized at 400 copies/ml, which was a widely adopted definition of viral suppression during mid-2000s. Additionally, association between trajectory groups and viral suppression was only assessed among those with at least viral load tests. If having any viral load tests were dependent of particular characteristic, selection bias could not be ruled out.

Despite these limitations, a main strength of the study is the use of a measure that captured dynamic aspects of jail incarceration and homelessness, potentially reflecting differing levels of housing instability. In addition, use of IPTW allowed for explicitly testing causal assumptions, further strengthening internal validity of the finding. Lastly, administrative data provided almost complete coverage of HIV care information provided to PLWHA in NYC.

In conclusion, sporadic exposure to brief jail incarceration and homelessness, relative to undisrupted community-dwelling after persistent shelter stays, was negatively associated with viral suppression among NYC PLWHA with recent incarceration and homelessness events. The study suggests that life disruption due to jail incarceration and homelessness does not appear to introduce additional barriers to receiving HIV care at recommended intervals but may exert negative physical and psychological influences on adhering to HIV treatment or receiving quality care, which is in turn related with low quality of life and survival. It also highlights the success of the reference group (i.e., high prevalence of viral suppression) who might experience stable community-dwelling for a relatively longer period. This finding justifies public health actions for housing stability through proactive case management and affordable housing options among

incarcerated and sheltered PLWHA in order to reduce risk of adverse health conditions and premature death.

Table 4.1. Demographic and criminal characteristics by five trajectory groups among 1,173 adults living with HIV/AIDS who were incarcerated in New York City jail and spent at least one night at New York City single adult shelter in 2001-2003

	NYC PLWHA§	Total	Temporary	Increasingly incarcerated	Decreasingly incarcerated	Decreasingly homeless	Continuously homeless
Total	82,896	1,173	782	116	126	56	93
Exposure in 2001-03							
Average # of incarceration events		3	2	6	4	3	2
Average days in jail		112	61	395	234	69	58
Average jail days per incarceration		51	35	121	109	30	28
Average # of shelter use events		6	3	6	4	9	23
Average days in shelters		78	32	50	43	230	456
Average shelter days per shelter event		14	8	9	13	58	41
Age as of 6/30/2002†							
18-24 years	3%	5%	4%	7%	7%	5%	6%
25-34 years	15%	22%	23%	22%	22%	18%	15%
35-44 years	40%	50%	50%	53%	51%	59%	47%

45-54 years	30%	20%	20%	18%	17%	18%	28%
55-89 years	12%	3%	3%	0%	3%	0%	4%
Sex††							
Male	69%	84%	85%	86%	76%	84%	87%
Female	31%	16%	15%	14%	24%	16%	13%
Race/ethnicity††							
Non-Hispanic white	21%	4%	4%	5%	3%	2%	5%
Non-Hispanic black	45%	65%	63%	72%	63%	79%	71%
Hispanic	32%	30%	32%	22%	32%	20%	23%
Asian	1%	0%	0%	0%	0%	0%	0%
Others/unknown	1%	1%	1%	1%	2%	0%	1%
Nativity††							
United States born	62%	93%	93%	94%	94%	98%	89%
Foreign born	13%	7%	7%	6%	6%	2%	11%
Neighborhood poverty							
Low (<10% below poverty)	5%	3%	3%	4%	2%	2%	4%
Medium (10 to <20%)	29%	14%	14%	16%	15%	11%	16%
High (20 to <30%)	14%	9%	9%	8%	13%	11%	9%
Very high (≥30%)	40%	42%	43%	43%	40%	38%	31%

Missing	11%	32%	32%	28%	31%	39%	40%
Types of criminal charges							
Drug possession		54%	42%	67%	50%	43%	46%
Drug sales		27%	24%	37%	44%	23%	27%
Violence		27%	24%	46%	35%	20%	31%
Public administration		31%	28%	43%	36%	36%	29%
Property		55%	40%	68%	52%	52%	44%
Weapons		3%	3%	5%	2%	0%	3%
Quality of life		7%	7%	7%	9%	7%	6%
Sex crimes		2%	2%	3%	3%	0%	5%
Substance use¶		48%	44%	68%	52%	54%	52%
Serious mental illness¶		3%	2%	3%	3%	2%	9%
Age at HIV diagnosis							
13-24 years	9%	9%	9%	11%	10%	4%	7%
25-49 years	81%	84%	84%	86%	80%	89%	85%
50+ years	10%	7%	7%	3%	10%	7%	8%

Stage of HIV infection							
Early (HIV only)	96%	97%	97%	98%	97%	96%	95%
Late (HIV/AIDS)	4%	3%	3%	2%	3%	4%	5%

Notes: Bivariate associations between trajectory groups and criminal charges with drug possession, drug sales, violent crimes, property crimes, or public administration were statistically significant. Also, bivariate associations between trajectory groups and proxy measure of substance use or proxy measure of serious mental illness were statistically significant.

Average numbers of homelessness events were significantly different across trajectory groups except for Decreasingly incarcerated vs. Increasingly incarcerated and Temporary vs. Decreasingly incarcerated patterns.

Average numbers of jail days or incarceration events were significantly different across trajectory groups except for Temporary vs. Continuously homeless, Temporary vs. Decreasingly homeless, and Continuously homeless vs. Decreasingly homeless patterns.

Average numbers of homelessness days were significantly different across trajectory groups except for Temporary vs. Increasingly incarcerated, Temporary vs. Decreasingly incarcerated, and Increasingly incarcerated vs. Decreasingly incarcerated patterns. §Non-incarcerated/non-sheltered NYC residents living with HIV/AIDS.

†Because age was calculated at the end of year according to NYC HIV registry and raw birthdate information was not available, age of nonincarcerated/non-sheltered PLWHA was as of 12/31/2002.

††Because a small % of missing data (sex: 1%, race/ethnicity: 1%, nativity: 1%) in the study cohort were not included, sum of these numbers were not matched up with total numbers of individuals. For non-incarcerated/non-sheltered PLWHA, % of missing data were much greater than that among the study cohort.

¶Proxy measures were used to capture substance use and prior severe mental illness conditions.

Table 4.2. Mean within and between cluster distance ratios

Cluster number	Mean w/mean b	Δw/b		
2	0.526			
3	0.502	-0.024		
4	0.495	-0.007	5	**0.487** **-0.008**
6	0.483	-0.004		

Abbreviations: w = within-distance; b = between-distance; Δw/b = change in mean w/mean b
The optimal solution should meet two criteria: 1) mean within-distance/between-distance ratio < 0.50; 2) large decrease in mean within-distance/between distance ratio by increasing an additional cluster. Numbers in bold indicate the optimal solution according to these thresholds.

Figure 4.1. Five non-overlapping groups of jail incarceration/homelessness trajectories according to sequence analysis among 1,173 adults living with HIV/AIDS who spent at least one night in a New York City jail and at least one night at a New York City single adult homeless shelters in 2001-2003

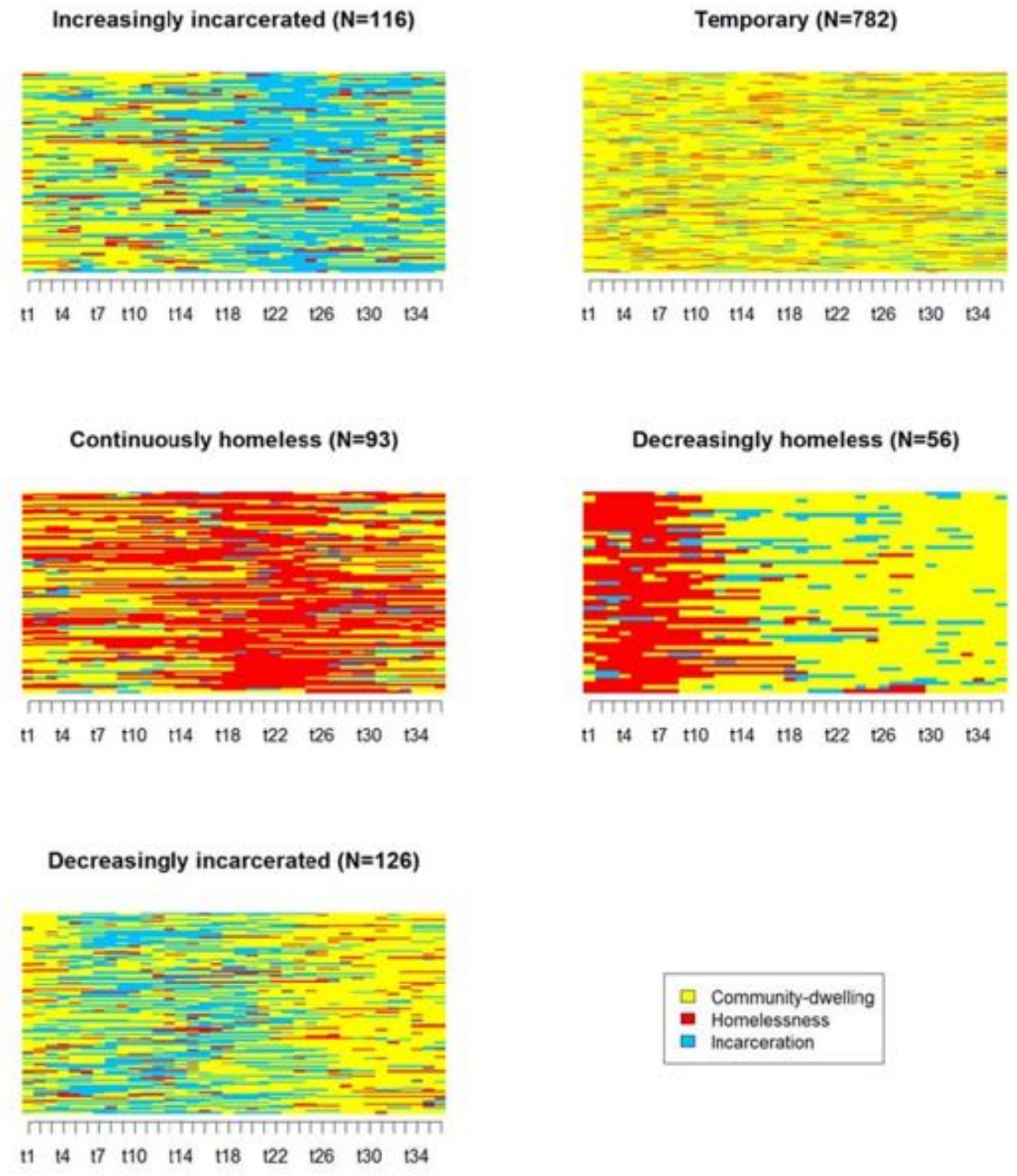


Table 4.3. Percentages of retention in HIV care and viral suppression by trajectory groups among adults living with HIV/AIDS with recent experiences of jai incarceration and homelessness, New York City, June 2005-June 2006

	N	% of retention in HIV care	Viral suppression	
			N in samples†	% of viral suppression
Non-incarcerated/nonsheltered NYC PLWHA	82,896§	50%	49,105	68%
The study population	1,173	48%	698	47%
Temporary	782	48%	457	47%
Increasingly incarcerated	116	48%	68	37%
Decreasingly incarcerated	126	44%	73	45%
Decreasingly homeless	56	52%	41	59%
Continuously homeless	93	51%	59	54%

Notes: †individuals who had at least one viral suppression visit during June 2005-June 2006.
§Non-incarcerated/non-sheltered NYC PLWHA who were diagnosed and alive before 1/1/2004.

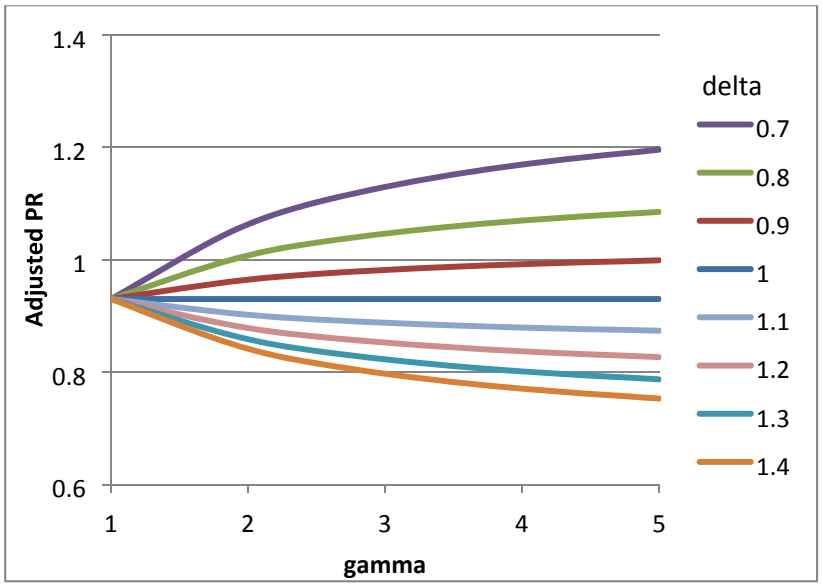
Table 4.4. Prevalence ratio for retention in HIV care and viral suppression by trajectory groups among 1,173 adults living with HIV/AIDS with recent experiences of jai incarceration and homelessness, New York City, June 2005-June 2006

Trajectory groups	Retention in HIV care		Viral suppression[a]	
	PR	95% CI	PR	95% CI
Temporary	0.92	0.66, 1.29	**0.71**	**0.54, 0.93**
Increasingly incarcerated	0.93	0.62, 1.41	0.74	0.49, 1.11
Decreasingly incarcerated	0.88	0.59, 1.31	0.72	0.49, 1.04
Continuously homeless	0.95	0.63, 1.41	0.83	0.57, 1.20
Decreasingly homeless	Reference		Reference	

Abbreviations: CI, confidence interval; PR, prevalence ratio.

Notes: Prevalence ratio was estimated from log-linear Poisson models. Numbers in bold indicate statistical significance at $p < 0.05$.
Inverse probability of treatment weight was used to control for bias due to confounding. Potential confounders for the model for retention in HIV care included age, sex, race/ethnicity, nativity, neighborhood poverty, a proxy measure of substance use, a proxy measure of mental illness, criminal charges due to drug sales, violent crimes, weapon possession, public administration, property crimes, quality of life crimes, sex crimes, ages of HIV diagnoses, and stage of HIV infection. The same sets of potential confounders except for criminal charges due to weapon possession were used for the model for viral suppression.
[a]
Restricted to the study cohort with viral suppression test records in June 2005-June 2006.

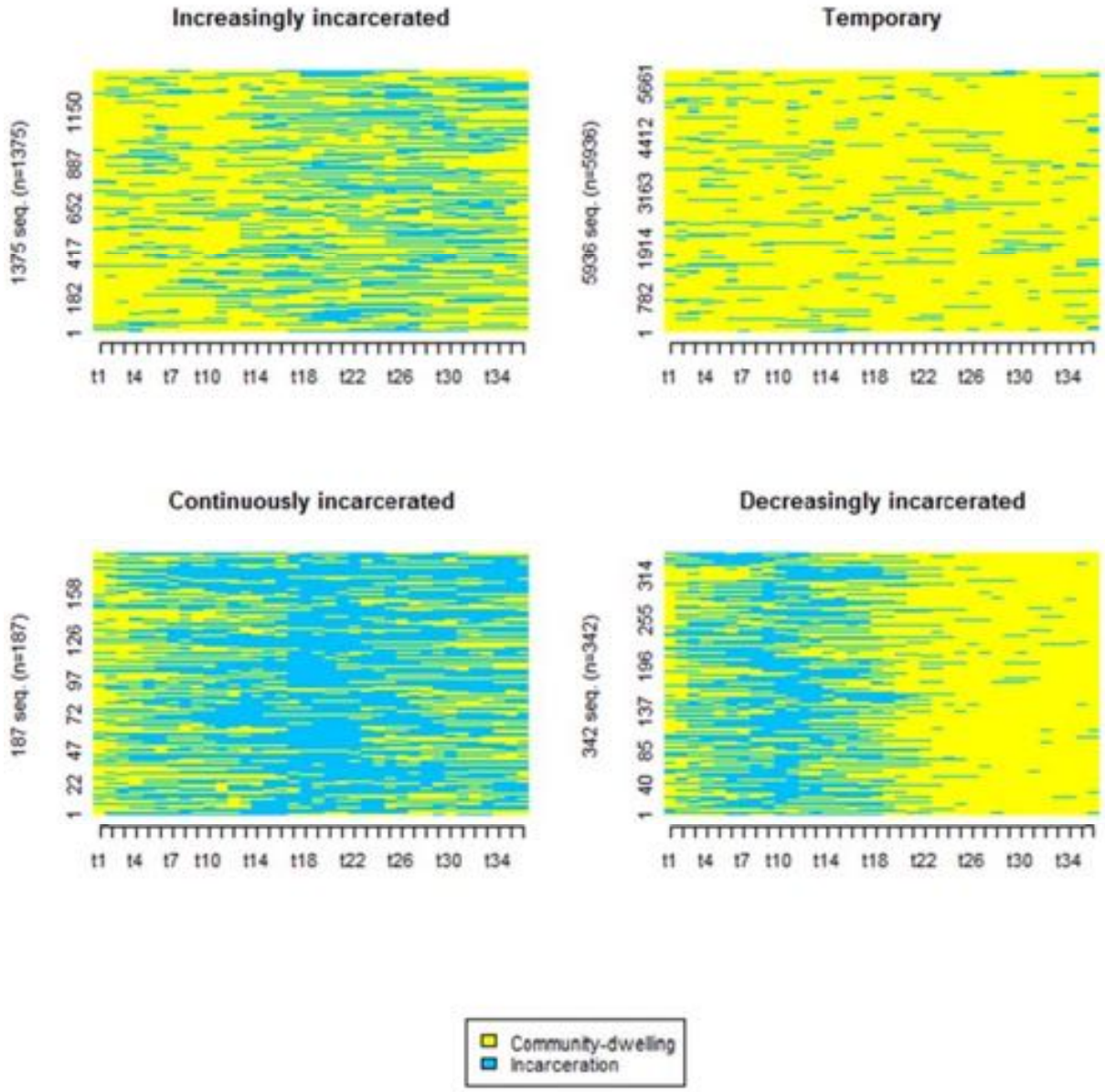
Figure 4.2. Estimated upper bound of 95% confidence intervals of prevalence ratio for viral suppression by the Temporary pattern adjusted for an unobserved confounder (*U*) among 1,173 PLWHA with jail incarceration and homelessness, New York City, June 2005-June 2006



Abbreviations: CI, confidence interval.
Notes: the upper bound of 95% CI of prevalence ratio of viral suppression by Temporary pattern was 0.93 from Table 3. *P(U=1|a=1,x)* was arbitrarily set as 0.5.
U = unmeasured confounder; δ = *P(U=1|a=1, x) / P(U=1|a=0,x)*; γ = *PR* of viral suppression by *U*.

Figure 4.3. Four non-overlapping groups of jail incarceration trajectories and four nonoverlapping groups of homelessness trajectories according to sequence analysis among 7,840 adults living with HIV/AIDS who were **incarcerated in New York City jails** and did not stay in New York City single adult shelters in 2001-2003, and 1,249 adults living with HIV/AIDS who **stayed in New York City single adult shelters** and were not incarcerated in New York City jails in 2001-2003, respectively

a. 7,840 incarceration-only PLWHA



b. 1,240 homelessness-only PLWHA

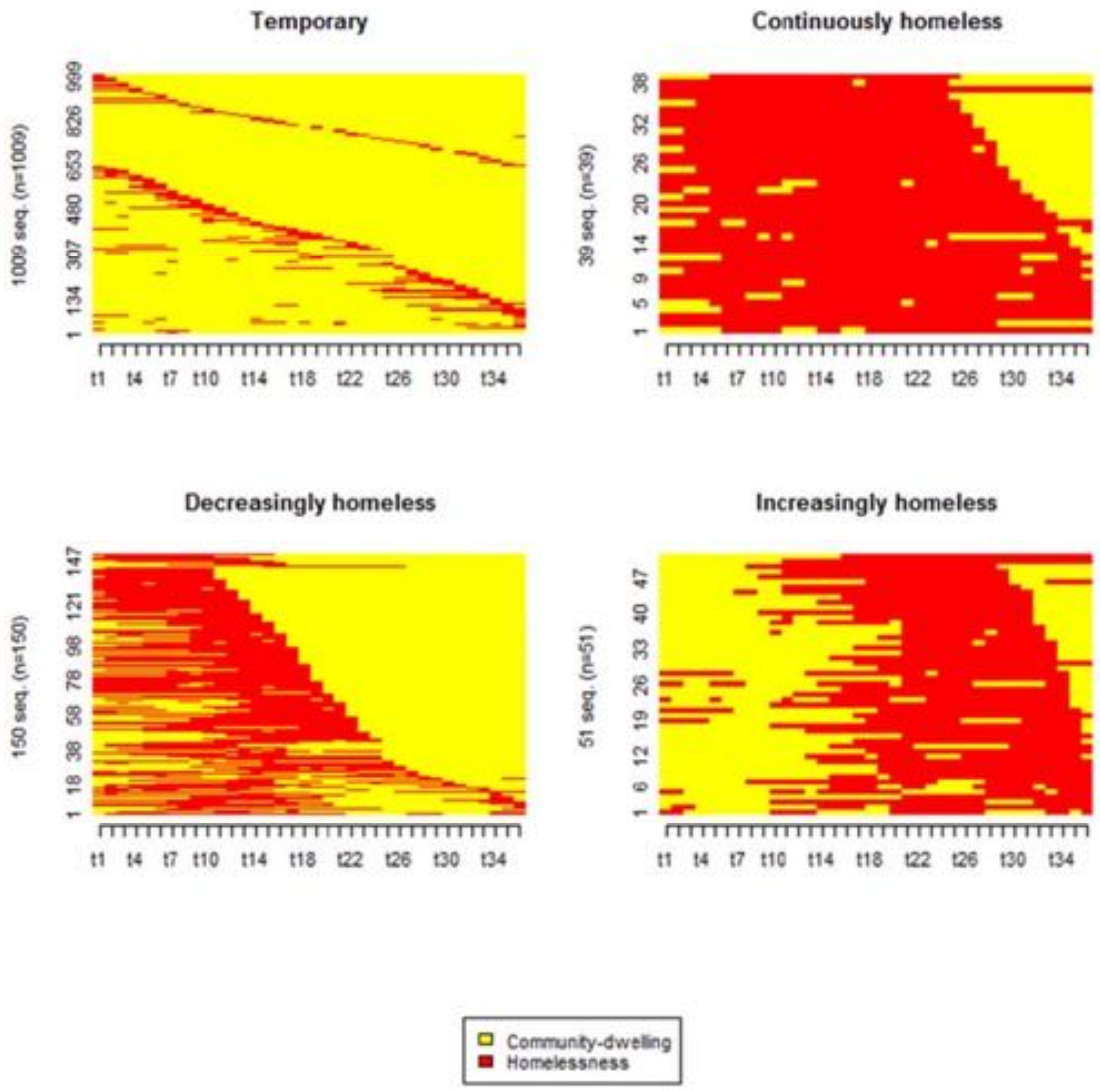


Table 4.5. Percentages of retention in HIV care and viral suppression by trajectory groups among adults living with HIV/AIDS with jail incarceration only and homelessness only, New York City, June 2005-June 2006

	N	% of retention in HIV care	N in samples†	% of viral suppression
				48%
			Viral suppression	
Incarceration-only population	7840	45%	4505	
Temporary	5936	47%	3455	49%
Increasingly incarcerated	1375	43%	792	45%

Continuously incarcerated	187	39%	109	45%
Decreasingly incarcerated	342	30%	149	52%
Homelessness-only population	1249	45%	674	54%
Temporary	1009	43%	531	52%
Increasingly homeless	51	53%	29	55%
Continuously homeless	39	46%	22	55%
Decreasingly homeless	150	55%	92	61%

Notes: †individuals who had at least one viral suppression visit during June 2005-June 2006.

Table 4.6. Prevalence ratio for retention in care and viral suppression during June 2005 through June 2006 by trajectory groups among 1,249 adults living with HIV/AIDS who **stayed in New York City single adult shelters** and were not incarcerated in New York City jails in 2001-2003

Trajectory groups	**Retention in care**		**Viral suppression**	
	PR	**95% CI**	**PR**	**95% CI**
Temporary	**0.77**	**0.65, 0.90**	0.86	0.71, 1.05
Increasingly homeless	0.94	0.62, 1.41	0.55	0.21, 1.46
Continuously homeless	1.06	0.74, 1.53	0.89	0.55, 1.45
Decreasingly homeless	Reference		Reference	

Abbreviations: CI, confidence interval; PR, prevalence risk.

Notes: Prevalence ratio was estimated from log-linear Poisson models. Numbers in bold indicate statistical significance at $p < 0.05$.
Inverse probability of treatment weight was used to control for bias due to confounding. Potential confounders for the model for year-specific viral suppression included age, sex, race/ethnicity, a proxy measure of substance use, and stage of HIV infection.

Table 4.7. Prevalence ratio for retention in care and viral suppression during June 2005 through June 2006 by trajectory groups among 7,840 adults living with HIV/AIDS who were **incarcerated in New York City jails** and did not stay in New York City single adult shelters in 2001-2003

Trajectory groups	Retention in care		Viral suppression	
	PR	**95% CI**	**PR**	**95% CI**
Temporary	**1.63**	**1.36, 1.97**	0.89	0.75, 1.06
Increasingly incarcerated	**1.43**	**1.17, 1.73**	0.85	0.70, 1.03
Continuously incarcerated	**1.48**	**1.08, 2.04**	0.97	0.70, 1.34
Decreasingly incarcerated	Reference		Reference	

Abbreviations: CI, confidence interval; PR, prevalence risk.

Notes: Prevalence ratio was estimated from log-linear Poisson models. Numbers in bold indicate statistical significance at $p < 0.05$.
Inverse probability of treatment weight was used to control for bias due to confounding. Potential confounders for the model for year-specific viral suppression included age, sex, race/ethnicity, nativity, neighborhood poverty, a proxy measure of substance use, a proxy measure of mental illness, criminal charges due to drug sales, violent crimes, public administration, property crimes, quality of life crimes, sex crimes, ages of HIV diagnoses, and stage of HIV infection.

Chapter 5. Discussion

5.1. Overview of the dissertation

This retrospective cohort study of incarcerated/sheltered NYC adults aimed to create a longitudinal measure of exposure to jail incarceration and homelessness that reflected timing and sequencing of these events, and to test whether a particular trajectory contributes to risk of mortality or discontinuity of HIV care. Monthly experiences of jail incarceration, homelessness, and community-dwelling over three years were summarized into group-based trajectories using sequence analysis. For each trajectory group, baseline demographic, behavioral, and criminal

characteristics were described. Then, the study examined associations between trajectories of jail incarceration/homelessness and risk of all-cause, drug-related, and HIV deaths during the subsequent two years. The study further focused on the sub-set of the study cohort living with HIV/AIDS, and tested whether trajectories of incarceration/homelessness were associated with retention in HIV care and viral suppression. In the following section, the main findings and interpretations are summarized.

5.2. Summary of the findings

5.2.1. Chapter 2

Analysis of NYC adults with histories of both jail incarceration and homelessness during 2001-03 identified this group to be predominantly minority males aged to 25 to 44 years from poor NYC neighborhoods. This study cohort was sociodemographically similar to the population that only experienced incarceration in NYC jails during the same period,[1] except for a higher prevalence of substance use and property crimes. Compared with the NYC homeless population with no history of jail incarceration, the study cohort was disproportionately younger and male.

Sequence analysis identified six trajectory groups of incarceration/homelessness in 2001-03. A majority of the study cohort spent most time outside of jail and shelters and sporadically experienced brief jail incarceration and shelter stays. The remaining 40% had mixed experiences of homelessness and incarceration in various lengths and frequencies. Sporadic experiences of incarceration and homelessness with brief stays (denoted as the **Temporary** pattern), as opposed to the other patterns with persistent jail or shelter stays, appeared to be most consistent with the concept of the revolving door pattern, although the actual frequencies of incarceration or

homelessness events were small and the majority of time of these individuals was spent in the community. Sporadic exposure to incarceration and homelessness can generate life disruption, leading to elevated stress levels and interrupting continuity of essential health care. Another possible mechanism is that individuals with the **Temporary** pattern are neither stable and established in the community nor likely to benefit in a stable fashion from health care services in jails or shelters and receive proper discharge plans than those who stayed longer in these institutions.

For the purpose of the comparison, trajectories of incarceration or homelessness were also examined for NYC adults with jail incarceration-only and those with homelessness-only during 2001-03. In both populations, four trajectory groups were identified and a majority exhibited the **Temporary** pattern. Within similar trajectory groups across incarcerated or sheltered NYC populations, short and frequent experiences of incarceration or homelessness appeared to be more common among the study cohort who had dual exposures relative to single exposure. In addition, among the subset of incarcerated people with the **Temporary** trajectories, particular criminal characteristics such as property crimes and drug possession were more prevalent among those with both experiences as opposed to incarceration-only. High prevalence of property crimes may indicate material deprivation or financial stresses in this population,[2] but it may also reflect disruptive behaviors resulting from substance use or mental illness.

5.2.2. Chapter 3

During 2004-05, the age-adjusted all-cause mortality rate among NYC adults who were both incarcerated and sheltered in 2001-03 was similar to that among homelessness-only population,

but higher than in incarceration-only population. Focusing on the incarcerated and homeless population, mortality risk during 2004-05 was estimated for each of six trajectory groups of incarceration and homelessness, which were identified in Chapter 2. The SMR analysis found that all-cause mortality risk of the study cohort with sporadic exposure to brief jail incarceration and homelessness (i.e., **Temporary** pattern) was significantly higher than that of nonincarcerated/non-sheltered NYC adults of the same age, sex, race/ethnicity, and neighborhood poverty (SMR = 1.35). The SMRs for drug-related and HIV deaths among individuals with the **Temporary** pattern were 4.60 and 1.54, respectively. Compared with non-incarcerated/nonsheltered NYC adults, excess risk of drug-related deaths was also observed in the other trajectories except for one group with persistent shelter stays without much disruption (**Continuously homeless**) and the other with incarceration during later months (**Increasingly incarcerated**), whereas there was no significant difference in risk of all-cause and HIV mortality between the other trajectory groups and non-incarcerated/non-sheltered NYC adults. Similarly, after balancing out differences in baseline covariates across six trajectory groups, the

Temporary versus **Continuously homeless** patterns was associated with the elevated risk of allcause, drug-related, and HIV deaths.

Excess risk of all-cause mortality among incarcerated & sheltered adults with the **Temporary** pattern may indicate health burdens attributed to the revolving door pattern. One possible mechanism is that disruption of quality medical care due to transitions from brief incarceration or homelessness to community-dwelling exerts negative influences on health conditions. It may also explain the association between the **Temporary** pattern and high risk of HIV death because

continuity of antiretroviral care is critical for survival among people living with HIV/AIDS.[3] This mechanism is further discussed in the summary of Chapter 4 below.

Compared with non-incarcerated/non-sheltered NYC residents, all trajectory groups except for **Increasingly incarcerated** and **Continuously homelessness** patterns were associated with excess risk of drug-related death. Individuals who were incarcerated during later months or consistently stayed in homeless shelters in 2001-03 were more likely to remain incarcerated or sheltered during subsequent two years, which might decrease circumstances to use drugs. Unlike drug-related death, risk of HIV death was not elevated among NYC adults who had incarceration/homelessness sustained for certain time points. During uninterrupted stays, they might benefit from medical services or referrals offered in shelters or jail. Indeed, data in Chapter 4 support this interpretation as retention in care was comparable to that among nonincarcerated/non-sheltered NYC PLWHA. However, prevalence of viral suppression among the study cohort living with HIV/AIDS was lower than NYC prevalence, implying that receiving regular care did not necessarily mean receiving quality care nor adhering to HIV treatment.

5.2.3. Chapter 4

Among the study cohort, 1,173 were diagnosed with HIV/AIDS prior to 2004. Nearly half of these individuals experienced retention in care during June 2005-June 2006. This percentage was comparable to that of non-incarcerated/non-sheltered NYC PLWHA who were diagnosed and alive prior to 2004. Unlike continuity of HIV care, overall prevalence of viral suppression was much lower among the study cohort with viral suppression records relative to nonincarcerated/non-sheltered NYC PLWHA.

Similar to the finding in Chapter 2, a majority of the study cohort living with HIV/AIDS sporadically experienced brief jail incarceration and homelessness in 2001-03, while the rest was more persistently incarcerated or sheltered for early or late months. This measure was independent of retention in HIV care, but significantly associated with viral suppression during the one-year follow-up time. Specifically, those with **Temporary** versus **Decreasingly homeless** patterns had 0.71 times lower prevalence of viral suppression.

The null association between trajectory groups and retention in HIV care implies that the study cohort would be able to receive HIV care at recommended intervals. Since affordable HIV medical services and various social services were available and easily accessible at many different settings in NYC including jails, shelters, and deprived neighborhoods, experiencing life disruption due to jail incarceration and homelessness might not act as a barrier to medical visits for those connected to care.[4]

The significant association between prevalence of viral suppression and **Decreasingly homeless** pattern implies that those who left shelters early months and persistently stayed in the community afterwards were more likely to experience viral suppression, which might result from receiving quality HIV care or adequately adhering to treatment. In contrast, adequate adherence to antiretroviral treatment might not be achieved among a group of PLWHA whose communitydwelling was sporadically disrupted by incarceration and homelessness. Given well-established access to permanent housing and housing services for NYC PLWHA, this result may

be further attributed to effective case management.[5] It also indicates a potential psychological influence of housing stability on complying with medical treatments.[6]

The study finding in Chapter 4 supports the earlier interpretation that excess risk of HIV mortality associated with the **Temporary** (or revolving door) pattern would be a manifestation of disruptions of medical care due to transitions from/to jails and shelters. Sporadically experiencing brief jail incarceration and homelessness, PLWHA may be less likely to comply with HIV treatment, which in turn negatively influences health conditions. It seems a plausible mechanism that explains the **Temporary** pattern-HIV mortality association in Chapter 3. Future studies that link mortality data with HIV registry will be beneficial to understand direct and indirect pathways from the revolving door pattern to HIV mortality.

5.3. Limitations

This study has several limitations. First, a process of identifying groups of trajectories required a strong assumption that heterogeneity of trajectories is derived from latent groups, not an underlying continuous distribution such as life course development of IQ, psychological attributes, and employment.[7] This assumption seems plausible because being homeless or incarcerated is a major life disruption and the policy convention recognizes unique groups of homeless adults such as chronic and episodic homelessness.[8] Empirically, the current trajectory groups of the study cohort represent unique experiences of jail incarceration and homelessness. Yet, more research is still warranted to reinforce theoretical and empirical support for groupbased trajectory modeling approach to describe longitudinal exposure to incarceration and homelessness. Second, the study used aggregate data to assess mortality risk among

nonincarcerated/non-sheltered NYC adults. Thus, inference from the SMR analysis in Chapter 3 should be made with caution because the estimated relative risk could be biased due to residual confounding. Third, homelessness, jail incarceration, and residing in the community were determined according to NYC single adult shelter use and NYC jail admission/discharge dates, which might underestimate true incarceration/homelessness events (e.g., street homelessness, incarceration outside of NYC). This bias, however, may be counterbalanced by overestimation of true community-dwelling, and improved validity and reliability of measures from administrative data as opposed to self-reports. In addition, death outcomes were likely to be underestimated because deaths outside of NYC were not captured in this study. The estimated relative risk for mortality is likely to be biased toward the null if this measurement error is independent of trajectory groups. Fourth, matched data from multiple registries did not contain much information about risk behaviors and clinical antecedents of excess mortality and morbidity risk. Even if the results from the sensitivity analyses assured excess mortality risk associated with the **Temporary** pattern, unknown factors that might explain the observed association cannot be completely ruled out. Fifth, the analysis was only based on study participants who used NYC shelters or jails and survived in 2001-03. This may introduce a survivor bias by conditioning on a collider. The excess drug-related mortality risk among the **Temporary** (the exposed) versus **Continuously homeless** groups (the unexposed) was attenuated and non-significant after adding early death cases. It may reflect the younger ages of early drug-related deaths among the unexposed, or the study design that no actual treatment was not provided to the exposed. Longer follow-up time is required to determine presence of survivor bias because 1) the sensitivity analysis result is based on a very small number of drug-related deaths; 2) trajectory grouping among early deaths is based on the two-year exposure period on average and may not be reliable.

Lastly, two years may not be a sufficient time to assess mortality risk due to chronic diseases. Long-term health impacts of some trajectories other than the revolving door pattern may be different from those observed for two immediate years.

5.4. Strengths and public health significance

There are a number of strengths in this study. First, by studying a large and representative sample of adults with both jail incarceration and homelessness, this study contributed to expanding descriptive data and a general understanding of the magnitude and nature of the 'revolving door' problem from a public health context. In particular, the use of the combined registry records allowed for identifying various trajectories of jail incarceration/homelessness, as seen in Chapter 2. Second, by linking these trajectories with baseline characteristics and health outcomes, the study yielded more complete profiles of demographic and criminal characteristics and risk of mortality and morbidity for adults cycling through jails and homeless shelters, compared with previous cross-sectional studies. It also allowed for testing a dose-response relationship between trajectories of jail incarceration/homelessness and health outcomes where the **Temporary** (or revolving door) pattern was considered as the highest dose.

Methodologically, the main strength of this study is an innovative approach to improve construct and internal validity of administrative data. First, using sequence analysis, temporal sequences and timing of jail incarceration and homelessness events were summarized into distinct groups of individuals. Compared with commonly-used simple indicator or time-aggregated measures of each event,[9,10] this approach allowed for more explicitly capturing potential life challenges associated with experiences of incarceration/homelessness.[11] For example, the current measure

identified a group with more frequent exposure to the vulnerable time after release from jail, which might have been collapsed with those with less exposure if sequencing of events were ignored. For PLWHA, trajectory groups of incarceration/homelessness are likely to be indicative of housing disruption because of their legal right and support to obtain permanent housing in NYC. Second, this study makes an important contribution to epidemiologic research by demonstrating analytic approaches to estimate causation from administrative data, which is challenging because of non-random exposure assignment and limited data about potential confounders. Existing studies tend to report associations adjusted for a small number of demographic variables, which may be insufficient to rule out influences from bias due to other confounders, selection, and measurement errors. In this study, violation of casual assumptions and confounding due to unobserved confounding were addressed via IPTW and sensitivity analyses. Specifically, by weighting the exposure-outcome relationship by an inverse of propensity score, differences in observed baseline characteristics across trajectory groups were controlled, meeting exchangeability assumption. Additionally, IPTW was tightly distributed around 1, justifying no adjustment to meet positivity asumption.[12] The potential violation of the stable unit treatment value assumption was also addressed by adjusting the estimates by poverty levels of neighborhood residency. Regarding bias due to unobserved confounders, the study performed sensitivity analyses and quantified the extent to which observed associations might be biased from causal association.

5.5. Policy recommendations and future research directions

This study provides important evidence that structural exposure to incarceration and homelessness contributes to adverse health conditions even after controlling for individual-level

risk factors. In general, individuals with both incarceration and homelessness had higher risk of all-cause and HIV mortalities, compared with those with incarceration-only and homelessnessonly, even if sociodemographic characteristics appeared to be similar across these three populations. Furthermore, after controlling for potential confounders, mortality risk was associated with distinct trajectories of incarceration and homelessness. These study findings justify allocating more resources to target a group of individuals characterized by their experiences of incarceration and homelessness (e.g., brief versus long-term stayers) rather than individual behaviors or demographics. Currently, NYC DOC administers a wide range of jailbased public health services including substance use disorders counseling, mental health screening and therapy, and opioid maintenance treatment.[13] Similarly, shelter entrants in NYC are required to fill out a screening form, which allows NYC DHS to make an initial assessment on mental and physical health conditions and provide services or referrals to shelter users.[14] During shelter stays, various social services including employment and housing are available, while follow-up referrals are provided upon discharge from shelters. Due to excess mortality risk associated with the **Temporary** pattern, these jail- and shelter-based programs should be expanded for more proactive engagement with individuals who briefly stay in jail or shelter, aiming to promote risk of overdose death and medical treatment options during and after jail/shelter stay. In particular, given high risk of drug-related death after release, NYC DOC and DHS should continue to collaborate with community organizations to strengthen communitylinkage services such as maintaining drug counseling/therapy and providing supportive housing with drug treatment services, as these have been effective in reducing overdose risk factors at both individual and environmental levels.[13]

For PLWHA, the finding supports the importance of discharge planning[15] and housing stability for health improvement.[16] For those cycling through shelters and jails, providing medical services at various settings may not be sufficient to improve health conditions. Social services that assist activities of daily living and stable lives may also play a crucial role in promoting quality of life and health conditions, as evidenced in the previous and current studies.[5] In NYC, a wide array of medical and social services are available for PLWHA, and further efforts such as outreach activities should be made to help them connected to these essential services to reduce recidivism and improve housing stability.[4] One recent example is Transitional care coordination program targeted for incarcerated PLWHA.[15] In 2006, this program was launched in order to integrate disorganized linkage services in NYC jail and improve transition to the community. Specifically, the program developed a holistic service delivery structure that emphasizes proactively tracking clients through jail-and community-based coordinators and electronic health records. Once PLWHA were identified during the jail intake, they were contacted at the first day of incarceration for HIV treatments. After this initial contact, incarcerated PLWHA were followed up at various time points during and after release to develop discharge plans and ensure connection to medical and social services in the community.

In conclusion, the study revealed six unique groups of trajectories of jail incarceration and homelessness among 15,620 adults who stayed for at least one night in NYC jails and NYC single adult shelters in 2001-03, and each group represented unique timing and sequencing of these events and life challenges. Among these trajectory groups, sporadically experiencing brief jail incarceration and homelessness was associated with excess risk of all-cause, drug-related, and HIV deaths. For the subgroup of the study cohort living with HIV/AIDS, this pattern was

associated with lower prevalence of viral suppression, compared with a pattern of prolonged shelter-free and jail-free period. These findings provide evidence for unique contribution of structural exposure on mortality and morbidity risk in this vulnerable population. Along with behavioral interventions, efforts to modify patterns of incarceration/homelessness experiences may be equally important to reduce risk of adverse health conditions. This study calls for further research and discussion to identify more refined mechanisms that explain association between longitudinal incarceration/homelessness experiences and mortality/morbidity, which leads to practical actions and policies for system-wide changes.

Appendix I. Baseline demographic and criminal characteristics before and after inverse probability of treatment weighting by trajectory groups among 15,620 adults who were both incarcerated and sheltered during 2001-03

	Temporary	Increasingly incarcerated	Increasingly homeless	Decreasingly incarcerated	Increasingly homeless	Continuously homeless
Total	9,467	1,343	1,793	1,293	1,033	691
Age as of 6/30/2002						
18-24 years	12%	10%	9%	10%	8%	5%
25-34 years	26%	27%	21%	25%	21%	15%
35-44 years	40%	45%	40%	46%	41%	39%
45-54 years	18%	15%	24%	15%	25%	32%
55-89 years	4%	3%	6%	4%	5%	9%
Age as of 6/30/2002 (weighted)						
18-24 years	11%	11%	10%	10%	10%	10%
25-34 years	25%	25%	25%	25%	24%	24%
35-44 years	41%	41%	41%	42%	41%	41%
45-54 years	19%	19%	19%	19%	20%	19%
55-89 years	4%	4%	5%	4%	5%	6%
Sex						
Male	90%	92%	90%	91%	90%	89%
Female	10%	8%	10%	9%	10%	11%
Sex(imputed and weighted)						
Male	90%	90%	90%	91%	89%	91%
Female	10%	10%	10%	9%	11%	9%
Race/ethnicity						
Non-Hispanic white	8%	6%	6%	5%	7%	6%

Non-Hispanic black	60%	65%	64%	64%	66%	69%

Hispanic	31%	28%	29%	30%	26%	24%
Asian	0% 1%	0% 1%	0% 1%	0%	0% 1%	0%
Others/unknown				1%		1%
Race/ethnicity (imputed and weighted)	7%	6%	7%		7%	
Non-Hispanic white	62%	62%	62%	7%	62%	7%
Non-Hispanic black	30%	30%	30%	61%	30%	63%
Hispanic	0% 1%	0% 1%	0% 1%	31%	0% 1%	29%
Asian				0%		0%
Others/unknown				1%		1%
	89% 11%	91% 9%	88% 12%		88% 12%	
Nativity						
United States born	90% 10%	90% 10%	90% 10%	94% 6%	90% 10%	88%
Foreign born						12%
Nativity (imputed and weighted)				90% 10%		
United States born	2%	2%	3%		3%	89%
Foreign born	16%	16% 9%	15%		13% 9%	11%
	10% 40%	41%	10% 40%	2%	40%	
Neighborhood poverty	32%	32%	32%	16% 9%	35%	
Low (<10% below poverty)				39%		4%
Medium (10 to <20%)				33%		15%
High (20 to <30%)	4%	3%	4%		4%	8%
Very high (≥30%)	23% 14%	23% 14%	23% 15%		22% 14%	35%
Missing	59%	60%	59%	3%	59%	38%
Neighborhood poverty (imputed and weighted)				23% 15% 59%		
Low (<10% below poverty)						3%
Medium (10 to <20%)						24%
High (20 to <30%)						14%
Very high (≥30%)						59%

Types of criminal charges

Drug possession	34%	51%	35%	46%	35%	43%
Drug sales	18%	31%	19%	35%	14%	22%
Violence	30%	46%	33%	40%	30%	28%
Public administration	30%	40%	31%	36%	30%	29%
Property	37%	60%	39%	53%	40%	44%
Weapons	4%	7%	5%	5%	3%	3%
Quality of life	9%	9%	9%	7%	9%	9%
Sex crimes	2%	3%	3%	4%	3%	4%
Types of criminal charges (weighted)						
Drug possession	38%	40%	34%	41%	36%	34%
Drug sales	21%	23%	21%	23%	20%	21%
Violence	32%	34%	33%	33%	32%	34%
Public administration	31%	30%	32%	30%	31%	29%
Property	41%	44%	42%	43%	41%	41%
Weapons	4%	5%	4%	5%	4%	4%
Quality of life	9%	7%	9%	8%	9%	8%
Sex crimes	3%	3%	3%	3%	3%	3%
Substance use	37%	54%	42%	49%	39%	51%
Substance use (weighted)	41%	42%	41%	43%	41%	40%
Serious mental illness	2%	4%	6%	2%	6%	9%
Serious mental illness (weighted)	4%	3%	3%	3%	3%	4%

Appendix II. Summary of inverse probability of treatment weight

	Mean	Std	Min	Max
All-cause and drug-related mortality model	0.996	0.324	0.164	4.125
HIV model	0.997	0.302	0.246	3.818

Abbreviations: std, standard deviation.

Appendix III. Two-by-two table of actual and imputed neighborhood poverty variables among randomly selected 25% of the complete data

	Imputed neighborhood poverty (row %)				
Actual neighborhood poverty	Low	Medium	High	Very high	Total
Low (<10% below poverty)	3539 (78%)	361 (8%)	199 (4%)	463 (10%)	4562
Medium (10% to <20%)	356 (1%)	25841 (83%)	1362 (4%)	3682 (12%)	31241
High (20% to <30%)	219 (1%)	1424 (7%)	15037 (79%)	2441 (13%)	19121
Very high (≥30%)	485 (1%)	3839 (6%)	2428 (4%)	55706 (89%)	62458

Notes: Simple kappa = 0.76 (95% CI = 0.76, 0.77), weighted kappa = 0.77 (95% CI = 0.77, 0.77).

Appendix IV. Baseline demographic and criminal characteristics before and after inverse probability of treatment weighting by trajectory groups among 1,173 adults living with HIV/AIDS who were both incarcerated and sheltered during 2001-03 and had viral load reports in 2004-05

	Temporary	Increasingly incarcerated	Decreasingly incarcerated	Decreasingly homeless	Continuously homeless
Total	525	73	88	42	59
Age as of 6/30/2002					
18-24 years	29%	30%	26%	17%	25%
25-34 years	51%	51%	52%	64%	51%
35-44 years	18%	18%	17%	19%	20%
45-54 years	2%	1%	5%	0%	3%
Age as of 6/30/2002 (weighted)					
18-24 years	28%	20%	27%	24%	26%
25-34 years	52%	62%	53%	51%	52%
35-44 years	18%	16%	18%	25%	20%
45-54 years	2%	2%	2%	0%	2%
Sex					
Male	84%	84%	76%	81%	86%
Female	16%	16%	24%	19%	14%
Sex (weighted)					
Male	83%	88%	87%	81%	84%
Female	17%	12%	13%	19%	16%
Race/ethnicity					

Non-Hispanic white	4%	4%	3%	2%	2%
Non-Hispanic black	66%	74%	61%	74%	76%
Hispanic	30%	21%	33%	74%	22%
Others/unknown	0%	1%	2%	0%	0%
Race/ethnicity (weighted)					
Non-Hispanic white	4%	1%	3%	1%	3%
Non-Hispanic black	67%	70%	64%	67%	65%
Hispanic	29%	28%	32%	31%	32%
Others/unknown	0%	1%	1%	0%	0%
Nativity					
United States born	93%	95%	93%	98%	90%
Foreign born	7%	5%	7%	2%	10%
Nativity (weighted)					
United States born	93%	91%	92%	92%	94%
Foreign born	7%	9%	8%	8%	6%
Neighborhood poverty					
Low (<10% below poverty)	3%	4%	1%	2%	5%
Medium (10 to <20%)	22%	22%	19%	29%	31%
High (20 to <30%)	12%	10%	18%	17%	10%
Very high (≥30%)	63%	64%	61%	52%	54%
Neighborhood poverty (weighted)					
Low (<10% below poverty)	2%	2%	3%	3%	2%
Medium (10 to <20%)	21%	17%	21%	27%	21%
High (20 to <30%)	13%	8%	12%	13%	11%
Very high (≥30%)	63%	73%	63%	56%	65%
Types of criminal charges					

Drug possession	46%	71%	56%	43%	51%
Drug sales	26%	41%	44%	19%	27%
Violence	22%	42%	35%	24%	32%

Public administration	29%	44%	36%	29%	32%
Property	41%	62%	43%	60%	44%
Weapons	3%	7%	2%	0%	2%
Quality of life	7%	11%	6%	7%	7%
Sex crimes	2%	4%	5%	0%	3%
Types of criminal charges (weighted)					
Drug possession	50%	59%	55%	47%	51%
Drug sales	29%	35%	30%	20%	33%
Violence	27%	27%	31%	18%	31%
Public administration	31%	23%	32%	41%	29%
Property	44%	44%	47%	58%	44%
Weapons	3%	5%	1%	0%	1%
Quality of life	7%	6%	6%	9%	5%
Sex crimes	2%	6%	2%	0%	3%
Substance use	47%	73%	58%	55%	58%
Substance use (weighted)	52%	61%	57%	50%	53%
Serious mental illness	1%	0%	3%	2%	2%

Serious mental illness (weighted)	1%	0%	1%	1%	1%
Age at HIV diagnosis					
13-24 years	10%	9%	9%	2%	10%
25-49 years	84%	89%	81%	90%	86%
50+ years	5%	1%	10%	7%	3%
Age at HIV diagnosis (weighted)					
13-24 years	10%	8%	14%	8%	8%
25-49 years	84%	91%	81%	87%	87%
50+ years	6%	2%	5%	5%	5%

Stage					
Late (HIV/AIDS)	3%	1%	3%	2%	5%
Early (HIV only)	97%	99%	97%	98%	95%
Stage (weighted)					
Late (HIV/AIDS)	3%	1%	2%	1%	3%
Early (HIV only)	97%	99%	98%	99%	97%

Appendix V. Summary of inverse probability of treatment weight

	Mean	Std	Min	Max
Retention in HIV care model	0.978	0.424	0.102	4.252
Viral suppression model	0.983	0.402	0.091	3.662

Abbreviations: std, standard deviation.

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The association of individual characteristics, perceived neighborhood social cohesion, and neighborhood poverty with achievement of HIV viral suppression among persons recently diagnosed with HIV and interviewed in New York City

Introduction

More than 40,000 persons in the United States (US) are diagnosed with HIV each year, of whom more than 3,000 are in New York City (NYC).[1, 2]. Federal guidelines recommend that persons with HIV have their viral load (VL) measured as soon as they begin HIV-related medical care after diagnosis and at least every six months thereafter.[3] HIV infection typically is followed by a very high VL (e.g., >100,000 copies of HIV RNA per milliliter of blood) that eventually declines to a lower set point that varies by individual and individuals' characteristics. Further reduction of HIV VL to levels that are low or undetectable (e.g., ≤400 copies/mL) is called viral suppression. Although a small percentage of persons is able to suppress virus without treatment (i.e., elite controllers), most persons suppress by being treated with combination antiretroviral therapy (ART).[4] Provided that the virus is sensitive to the multi-drug regimen chosen and the person is adherent, ART suppresses virus quickly (within 24 weeks) and durably.[5, 6]

Viral suppression not only slows progression of HIV disease [7] but also reduces the likelihood of onward sexual transmission.[8] The US National HIV/AIDS Strategy set as a goal a 20% increase by 2015 in the proportion of persons in populations most affected by HIV (blacks, Hispanics, and gay and bisexual men) who are virally suppressed.[9] Updated national HIV treatment guidelines now recommend that all persons with HIV be offered ART, although until recently, it was recommended that persons begin ART only once immunocompromised.[3] Although retention in care and ART are the main drivers of viral suppression, more rapid achievement of suppression has also been associated with individual-level demographic characteristics, e.g., older age,[10-12] male sex,[13-15] non-black race [10, 16-20], and baseline clinical status indicators such as higher? CD4 count and lower? VL.[12, 21, 22]

Studies focusing on individual-level factors affecting viral suppression may benefit from the addition of social and structural variables, such as perceived neighborhood social cohesion and neighborhood-level socioeconomic status. Lower perceived neighborhood social cohesion has been associated with lower primary care use among older urban adults[23] as well as lower condom use and

higher sexually transmitted infection (STI) rates among urban adolescents and young adults.[24, 25] The time from HIV diagnosis to viral suppression may be influenced by care-seeking behavior because ART and VL testing are offered exclusively in the context of medical care visits. Suppression may be influenced by condom use and STI rates because STI infection can increase VL. However, the association of social cohesion with HIV outcomes has not been explored. Neighborhood social cohesion is typically measured by responses to a scale that includes several interview questions (refs?), and we had the unique opportunity to do use a validated scale? for a random sample of New Yorkers recently diagnosed with HIV. Lower neighborhood-level socioeconomic status has been associated with higher rates of diagnosis of HIV or AIDS, delayed access to treatment, and mortality, at both the individual and neighborhood level.[26-33] For example, in a US city, HIV-positive residents of higher-unemployment neighborhoods were less likely to be on ART, thus reducing their likelihood of achieving suppression.[33] Moreover, in a province of Canada, a country with universal health care and free HIV treatment, after controlling for clinical characteristics, residents of lower-SES neighborhoods (as measured by median income) were less likely than residents of higher-SES neighborhoods to be prescribed the particular ART regimen that was the standard of care.[27] Thus, neighborhood SES has been shown to have an effect on ART use in some settings; this association has not been explored to date in NYC.

Commented [HJ1]: Which city? IF this is NYC than do we know the answer already?

We investigated the effect of individual characteristics, perceived neighborhood social cohesion, and neighborhood-level poverty on achievement of viral suppression, among NYC residents who were diagnosed with HIV between 2006 and 2012 at ≥13 years of age. You need to add a sentence or two about why it matters – e.g. – if neighborhood factors play a role in ability to achieve viral suppression, then what? What is the public health significance?

Methods

Data sources

This retrospective analysis used data from the NYC HIV surveillance registry, the NYC arm of the CDC-coordinated Case Surveillance-Based Sampling project (CSBS),[34] the 2010 US Census,[35] and the 2011 American Community Survey.[36] The registry includes all persons diagnosed and reported with HIV in NYC since 2000. It gathers information by medical record review, provider report at diagnosis, and HIV-related laboratory tests, which are electronically reported to surveillance for all existing cases

receiving diagnosis and/or care in NYC. Individual-level data acquired from the registry included demographic and clinical information collected at the time of first report, ZIP code of residence at diagnosis, and HIV-related laboratory test results from January 1, 2006, to June 30, 2014. Laboratory reports contain the test type, specimen collection date, result, and submitting facility. Reports on existing cases are added to their surveillance registry record; reports that do not match to an existing case are initiated for field investigation to confirm the diagnosis and collect other registry data. All registry data were reported as of September 30, 2014.

Data from CSBS included individual-level information on household income, number of persons who depended on that income (a proxy for household size), highest educational level completed, and three questions that were aggregated to develop an index of perceived neighborhood social cohesion. CSBS data were from the interview portion of the 2012-2014 cycles of the study and reported by April 15, 2015. Finally, neighborhood data at the level of ZIP code tabulation area (ZCTA) were acquired from the 2010 US Census and the 2011 American Community Survey 5-year estimates. ZIP codes are a system of delineating areas for postal service, and most people know the ZIP code of their residence, while ZCTAs are geographic areas used by the Census and ACS as close geographic approximations of ZIP codes.[37] ZIP codes, which in NYC are typically larger than Census tracts but smaller than congressional districts and counties, were the smallest readily available geographic unit of analysis. Neighborhood data were linked to cases through the ZIP code of patient residence at time of first diagnosis?.

Commented [HJ2]: And an interview? How does this relate to the paragraph below?

Commented [HJ3]: Confused how this relates to the lab results through June 30 listed above.

Commented [HJ4]: Where did these questions come from? Has this index been used before?

Commented [HJ5]: What is this?

Commented [HJ6]: Again, how does this relate to the June 30 and September 30th dates above?

Population

NYC residents who were newly diagnosed with HIV between 2006 and 2012 at ≥18? years of age and who were interviewed for CSBS were eligible for the analysis. CSBS selected a random sample of XXX persons ≥18 years of age from the HIV surveillance registry for each of three years (2012-2014), stratified by time period of diagnosis. The 294 persons located and interviewed for CSBS in 2012-2014 were excluded if they: were not newly diagnosed with HIV between 2006 and 2012 at ≥13 years of age (n=152), did not have an NYC ZIP code of residence at diagnosis (n=9), did not have a Western blot confirmatory test within 31 days post-diagnosis *and* were not diagnosed during acute HIV infection (i.e., their true diagnosis date was uncertain; n=6), had a suppressed (≤400 copies/mL) viral load ≤31 days

Commented [HJ7]: How many people?

Commented [HJ8]: So does not include 13-17 year olds, right?

Commented [HJ9]: Year? Quarter? Month?

Commented [HJ10]: 18 or 13?

after diagnosis which therefore suggested a misclassified diagnosis date (n=11), or did not respond to all three questions about perceived neighborhood social cohesion (n=24). These exclusions yielded an analytical sample of 92 persons (see Appendix 5).

Commented [HJ11]: This is for the social cohesion analysis – but you have more data points for low SES, no?

Outcome

The outcome of interest was the first VL test after HIV diagnosis that indicated suppression (≤400 copies of HIV RNA/mL plasma). The cut-off was 400 copies/mL because this was the highest lower detectable limit of VL assays in use during the study period.[38] Censoring occurred at death or the end of the follow-up period, whichever came earlier. Follow-up time was calculated as the number of days from the date of HIV diagnosis to suppression, death, or 6/30/2014, whichever came first.

Commented [HJ12]: Ok -so make clear above how the end date of data collection occurred.

Commented [HJ13]: Was everyone followed for a minimum of 6 months? 12 months?

Although treatment guidelines recommend VL tests at certain intervals after HIV diagnosis, some persons with HIV may have infrequent or no VL tests after diagnosis, because they were never linked to HIV-related medical care, they seek care infrequently, or their physician does not test their VL at every care visit. Persons who were not known to be dead and who had no suppressed VL (including persons with infrequent or no VL tests) were presumed not to be suppressed and contributed follow-up time as long as they were alive.

Commented [HJ14]: How many people are in this category from the 92?

Covariates

Demographic characteristics (age, sex at birth, race/ethnicity, area of birth), HIV transmission risk (also referred to as transmission categories), diagnosis date, viral loads, CD4 counts, estimated poverty status, perceived neighborhood social cohesion, and ZIP code of residence at diagnosis were extracted from the NYC HIV surveillance registry and CSBS. Age at HIV diagnosis was calculated from birth date and date of diagnosis and categorized as 13-29 and 30+.[2] Sex at birth was classified as male or female. Race (white or Caucasian, black or African American, Asian or Pacific Islander, and Native American) and ethnicity (Hispanic, non-Hispanic, or unknown) were collected through two questions and combined into a single variable that was dichotomized as: black or Hispanic, and other for those of other race/ethnicity. Country of birth was collected as country of birth when available or region of birth and categorized as born in the US or a US dependency (e.g., Puerto Rico), or a foreign country. HIV transmission risk category was based on the self-reported pre-diagnosis risk behaviors of the case (e.g., injection drug use, male-male sex) and the sex, HIV status (e.g., HIV-positive), and risk (e.g., injection

Commented [HJ15]: I would clarify and start with your main exposures of interest – if they were your main exposures as described in the introduction – and talk about neighborhood social cohesion and neighrohood poverty. This section does not erally match the set up in the intro – hard to know what you are testing and what your hypotheses are.

Little unclear if you are thinking of these neighborhood factors as exposures of intereset, in which case you want to justify inclusion of individual characteristics as potential confounders – or whether you are thinking of this as a predictive model so want to see if your model fit improves when you add neighborhood level variables.

Commented [HJ16]: Country? Region?

drug use) of the pre-diagnosis heterosexual-sex partners that s/he reports (which could indicate high-risk heterosexual risk).[39] This information was combined into hierarchical, mutually exclusive categories for the case: injection drug use (IDU), men who have sex with men (MSM), heterosexual sex, and other or unknown (which included perinatal transmission),[12] and these categories were then combined into three final groups: MSM, heterosexual, or other or unknown. To be classified as a heterosexual male or female, persons must have reported pre-diagnosis sex with a partner of the other sex who was HIV-infected, had injected drugs, or had received blood products. In addition, females only could be classified as heterosexual if they had probable heterosexual transmission noted in their medical record, reported sex with a male and not have injected drugs, or had any one of several behaviors associated with heterosexual transmission: history of prostitution, multiple sex partners, sexually transmitted disease, crack/cocaine use, or sex with a bisexual male.[2] For analytic purposes, the year of diagnosis was determined from the earlier of physician diagnosis date or positive Western blot test result and grouped as 2006-2009 and 2010-2012. CD4 count (if any) at diagnosis (i.e., within 3 months of diagnosis) and year of diagnosis vis-à-vis treatment guidelines were used to estimate treatment eligibility and as a proxy for receipt of ART, on the presumption that the majority of persons reaching the federal treatment threshold would receive ART. Treatment-eligible persons included those diagnosed in 2006-2007 with CD4<200, diagnosed in 2008-2009 with CD4<350, or diagnosed in 2010-2012 with CD4<500, reflecting changing treatment guidelines that increased the CD4 count at which ART initiation was recommended.[40-42] All other persons were not known to be eligible and were classified as not eligible. Estimated poverty status was calculated based on responses in CSBS to questions about household income (which was collected as a range) and number of persons who depended on that income. These were compared with US Census Bureau weighted average poverty thresholds for 2013 by size of family unit, and then classified as below the threshold (and thus “non-poor”) or above (“poor”).[43] Perceived neighborhood social cohesion was calculated from responses to three questions about trust, closeness, and helpfulness between neighbors using a scored 1-4 Likert scale. [24, 25] Responses were summed, and these sums of 3-12 were dichotomized at a natural break that would place approximately equivalent numbers of persons in each category.[25] Specifically, the majority of sums were 6, 9, or 12 (>20% each), and 48% of persons had sums of 3-8. Lower scores indicated agreement with positive statements

Commented [HJ17]: What happened to IDU?

Commented [HJ18]: Why did you group them like this?

Commented [HJ19]: Given this distinction, not clear why 2006-7 was combined with 2008-9?

about the neighborhood; perceived neighborhood social cohesion was classified as high for persons with sums of 3-8 and low for persons with sums of 9-12.

Analyses included percent of residents in a ZIP code with incomes under the federal poverty threshold, from 2011 American Community Survey (ACS) 5-year estimates because the 2010 decennial census did not collect poverty information.[44] This poverty measure has been associated with HIV and sexually transmitted infections.[26, 27, 29, 30, 45, 46] Poverty was dichotomized as <20% (low or medium poverty) or ≥20% (high or very high poverty), based on a four-category recommendation of the NYC health department that was collapsed into two categories.[47]

Commented [HJ20]: Do you mean with risk of acquiring these infections or with management and treatment of them or both? Is this in NYC or in the US?

Statistical analysis

Descriptive statistics for selected individual and neighborhood characteristics were calculated and presented for the overall population and according to suppression status within 12 months of diagnosis. Significance of associations between each variable and achievement of suppression within 12 months was assessed using Chi-square tests. The Mann-Whitney U test was used to ascertain differences in median days to suppression by the end of follow-up.

Commented [HJ21]: You need to explain that this is one way you looked at your outcome when you describe the outcome above.

Kaplan-Meier curves showing the number of days from diagnosis to suppression were generated by key individual and neighborhood characteristics, and log-rank tests were used to indicate differences between groups.

Cox proportional hazards regressions estimated the association of individual and neighborhood factors with suppression in crude and adjusted models. Because of the small sample size, we did not account for correlations of individual outcomes within neighborhood (ZIP code).[48, 49] Unadjusted models were fitted to estimate the unadjusted hazards of viral suppression for each individual and neighborhood characteristic. In addition, a series of multivariable models were fitted, striving for parsimony given the small sample size. Our final model included age at HIV diagnosis, sex at birth, race/ethnicity, year of HIV diagnosis, and ART eligibility, for consistency with previous models of viral suppression,[12] as well as perceived neighborhood social cohesion and neighborhood-level poverty.

Commented [HJ22]: Did you look to see how correlated these two variables were? If highly correlated not sure it makes sense to put both in the same model?

All analyses were conducted using SAS 9.2 (SAS Institute, Cary, NC). Ethical approval for these analyses was provided by the Institutional Review Boards of Lehman College of the City University of New York and of the NYC Department of Health and Mental Hygiene.

Results

Descriptive statistics

Of 92 New Yorkers newly diagnosed with HIV in 2006–2012 and interviewed by CSBS, approximately three-quarters were male (72.8%), and black or Hispanic (82.6%; Table 1). More than half were ≥30 years old (66.3%), born in the US or a US dependency (68.5%), MSM (51.1%), diagnosed in 2010-2012 (54.3%), not eligible to receive treatment based on CD4 count and diagnosis year (53.3%), poor (60.9%), perceiving low neighborhood social cohesion (52.2%), and residents of high- or very-high-poverty neighborhoods (57.6%).

Sixty-five percent of the population achieved suppression within 12 months of diagnosis (Table 1). Suppression rates at 12 months were lower among persons who were younger (45.2% of persons 13-29 years old achieved suppression vs. 75.4% of persons ≥30), black or Hispanic (59.2% vs. 93.8%), born in the US or a US dependency (57.1% vs. 82.8%), and not eligible for treatment (46.9% vs. 86.0%; all *p*-values<0.05). Similarly, compared with persons who suppressed within 12 months, those who did not were more likely to be younger (53.1% were 13-29 years old), black or Hispanic (96.9%), born in the US or a US dependency (84.4%), and not eligible for treatment (81.3%).

Almost the entire population (95.7%) achieved viral suppression by 6/30/2014 (not shown), in a median of 180 days (Table 1). Suppression happened least quickly among persons who were younger (377 days), black or Hispanic (203 days), born in the US or a US dependency (218 days), not known to be eligible for treatment (372 days), or who had low perceived neighborhood social cohesion (204 days; all *p*-values <0.05). Differences were most prominent by age (164 days among persons ≥30 years old vs. 377 days among 13-29) and treatment eligibility (159 days among eligible vs. 372 days among not eligible). Kaplan-Meier survival curves demonstrated the difference in achievement of suppression between persons eligible and not eligible for treatment (p=0.0003; Figure 1a), as well as the lack of difference between persons with low and high perceived neighborhood social cohesion (p=0.9541; Figure 1b) and residents of high- or very-high-poverty vs. low- or medium-poverty neighborhoods (p=0.4552; Figure 1c).

Unadjusted and adjusted models

Table 2 presents the unadjusted and adjusted HRs for HIV viral suppression among CSBS participants newly diagnosed with HIV in NYC. The unadjusted HRs show that persons who were black or Hispanic, born in the US or a US dependency, diagnosed in 2006-2009, or not eligible for treatment were at least 42% less likely to achieve viral suppression (range 42% to 60%) than their counterparts. Perceived neighborhood social cohesion and neighborhood-level poverty were not associated with suppression.

Multivariable regression included age at HIV diagnosis, sex at birth, race/ethnicity, year of HIV diagnosis, ART eligibility, perceived neighborhood social cohesion, and neighborhood-level poverty. After adjustment, the likelihood of viral suppression was 55% lower for blacks or Hispanics (95%CI=0.23-0.86) than persons of another race/ethnicity, and 42% lower among persons not eligible for treatment (95%CI=0.35-0.96) than treatment-eligible persons. Year of diagnosis, perceived neighborhood social cohesion, and neighborhood-level poverty were not associated with suppression in the fully adjusted model but were included given our interest in these factors. Compared with a model with variables for age at HIV diagnosis, sex at birth, race/ethnicity, year of HIV diagnosis, and treatment eligibility, this model (which added cohesion and poverty variables) did not have significantly better fit (-2LL: 617.2; p=0.6044; see Appendix 5).

Discussion

Controlling for individual characteristics, neighborhood poverty, and perceived neighborhood social cohesion, persons who were black or Hispanic and who were not eligible for treatment were less likely to achieve HIV viral suppression after diagnosis. Neighborhood poverty and perceived neighborhood social cohesion did not influence the time from diagnosis to viral suppression.

Consistent with a previous study using NYC HIV surveillance data.[12], we found that black race and not being eligible for treatment were associated with delayed suppression. Treatment eligibility and suppression were associated with each other presumably because treatment-eligible persons were more likely to have been prescribed ART, the primary means of lowering viral load. However, in contrast, findings for perceived neighborhood social cohesion and neighborhood characteristics were not consistent with previous findings on their relationship with care-seeking behavior and HIV and/or STI

outcomes.[23-33] As relates to cohesion, perhaps it is not associated with condom use, STIs, and care-seeking behaviors among persons with HIV in NYC, or there may be other factors that then prevent those from influencing time to suppression. For example, the system of care and services, comparatively generous benefits, and large HIV-positive population in NYC make it a relatively attractive place for HIV-positive persons to live and receive care, and may mitigate the influence of neighborhood cohesion or poverty. While neighborhood-level socioeconomic factors have been associated with HIV diagnosis rates in NYC and elsewhere, and some care-related outcomes,[26-32] in our analysis, neighborhood poverty was not associated with time to suppression once diagnosed. Several possible explanations include: different outcomes (e.g., time from ART initiation to suppression vs. time from diagnosis to suppression); different settings (e.g., Canada vs. US, or other US areas vs. NYC); HIV care is perhaps comparably accessible and effective regardless of characteristics of the NYC neighborhood in which people live, mitigating neighborhood-level disadvantage after diagnosis; publication bias may have limited the publication of previous null findings on neighborhood characteristics and HIV outcomes, so our findings may be consistent with some previous, unpublished analyses;[50, 51] and individual characteristics are more important than neighborhood characteristics in achieving suppression after diagnosis.

Commented [HJ23]: Could it also be that your study did not have sufficient power to detect an effect?

Commented [HJ24]: Again – or you had insufficient power to really test this.

Limitations

As in any population-based analysis of HIV care, ours had VL data only when persons sought care, which was at their discretion. Persons in this analysis were not necessarily tested at regular intervals. Persons may have achieved suppression sometime before it was measured in a VL test. It is not clear whether these circumstances would have increased or decreased the hazards ratios we found. However, all persons in the analysis had at least one VL test between 8 days post-diagnosis and censoring. Among them, persons diagnosed in 2009, for example, had a median of 13 VL tests (IQR: 7-17) and the median interval between tests was 140 days (<5 months; IQR: 106-264 days), while persons diagnosed in 2012 had a median of 8 tests (IQR: 6-10) and the median interval between tests was 85 days (<3 months; IQR: 67-98 days). These statistics indicate that the majority of New Yorkers recently diagnosed with HIV and interviewed by CSBS were engaged in care at intervals that were both consistent with federal guidelines and sufficiently frequent to produce estimates of suppression.

Persons in this analysis were interviewed by CSBS, numbered fewer than 100, and nearly universally achieved suppression by the end of follow-up. That these persons could be found in NYC and were sufficiently available for an interview suggests that they may differ from other recently diagnosed and reported New Yorkers, i.e., they may be more likely to still be living in NYC, be in care, and achieve suppression, although it is unclear whether this might affect the relationship between cohesion or poverty and suppression. Similarly, analyses of persons with HIV in NYC (who were not necessarily recently diagnosed, unlike our analysis population) found that many reported to surveillance appeared to no longer live in NYC, and when those were excluded, the rates of care were higher.[52] This analysis was conducted with a small population considering the numerous factors we sought to explore in multivariable analysis. With a larger population, we may have found additional individual characteristics – specifically, younger age and earlier year of diagnosis, whose AHRs indicated >30% reduced hazards of suppression but whose confidence intervals extended modestly above 1.0 – to be associated with delayed suppression, particularly given the findings of prior analyses among newly diagnosed New Yorkers that showed these characteristics to be important.[12, 53] Specifically, a larger population would have produced narrower confidence intervals that may have been entirely below 1.0 for the aforementioned factors. However, a larger analytic population may not have changed our findings that social cohesion and poverty were not associated with suppression. There is less evidence in the literature for these relationships, particularly as relates to social cohesion and HIV outcomes, and the AHRs for these characteristics in our analysis were closer to or equal to 1.0, so it seems unlikely that there was a substantial effect that we were simply underpowered to detect. Additionally, it may be that persons certainly in NYC (in this analysis, indicated by their findability for CSBS interview) have high rates of suppression and that differences by subgroups are relatively small, offering an alternative explanation of why only a few characteristics were significantly associated with suppression. A previous study of newly diagnosed persons who, according to surveillance records, appeared never to have entered HIV care found that three times as many of these persons self-reported that they were in fact in care as the number who agreed that they were out of care.[54] With near-universal care engagement among persons completing CSBS interviews, subgroup differences in suppression may indeed be minor, supporting our findings that few factors were associated with suppression.

Commented [HJ25]: Again this makes it sound like these are your exposures of interest – needs to be reflected in the methods section

Commented [HJ26]: I would state this in another way. "For example, in a previous analysis of all of the HIV cases in NYC, we found age and year of diagnosis also to be associated…"

Commented [HJ27]: Hmm – ok but could it also be how you coded them – you dichotomized them both to low vs. high – how many of them were close to the middle of this break so not that different from each other? For social cohesion – did you try just using a single question that had a scale of 1-4? How well were the questions correclated with one another – if the majority responded as 2, 3 or 4 to all of the questions (so their score was 6, 9 or 12) then perhaps just using a single question with a score from 1-4 would be more meaningful? Or collapse the 1 and 2 together if there were so few people who said 1, to have 3 groups?

There are several steps between diagnosis and suppression in the continuum of care for HIV-positive persons.[10, 55] By design, this analysis did not elucidate the exact step(s) at which the factors measured affect suppression. This means that the associations that we found exist for the overall process from diagnosis to suppression but not necessarily for individual steps between them. For example, ART eligibility may not influence time from diagnosis to linkage of care but rather only time from linkage to suppression.

Strengths

This is the first analysis to investigate the influence of perceived neighborhood social cohesion on HIV outcomes, and among the first US analyses to use surveillance data to investigate the role of neighborhood factors on HIV outcomes. [24-27, 56, 57] The data were drawn from population surveillance in the largest HIV epidemic in the US, in a diverse US city, and included only persons confirmed (by locating them at an NYC address) to still be in the jurisdiction. The analysis combined data from multiple sources to assess the potential influence on viral suppression of factors beyond the individual. Mandatory electronic reporting of laboratory tests in NYC provided information about all measured VLs for all HIV-positive persons receiving care in NYC, as opposed to in a clinical trials environment, where findings can differ from those in a population setting.

Commented [HJ28]: As I think about it more, this really seems to be your variable of interest (more so than neighborhood poverty – which you could do with all fo the registry data (I think) rather than with this very small subsample – perhaps it makes sense to frame this paper slightly differently to explore whether perceptions of neighborhood social cohesion impact HIV VL suppression after adjusting for individual level characteristics? If you want to know about neighborhood poverty, I would think you should use the larger sample size – unless you want to consider this another item to adjust for when exploring the impact of social cohesion

Conclusions

New Yorkers recently diagnosed with HIV, confirmed to be in NYC, and available for interview have almost universally achieved viral suppression. Just as black and Hispanic race and ethnicity and ineligibility for ART were associated with non-achievement of suppression, non-black, non-Hispanic race/ethnicity and ART eligibility seem to have helped persons newly diagnosed with HIV to achieve viral suppression faster, and thus, improve their health and preventing ongoing HIV transmission. Individuals with characteristics associated with slower achievement of suppression may need more assistance after diagnosis with linkage to and retention in care or ART prescribing and adherence. For example, black and Hispanic persons need better care that permits them to receive ART and become suppressed at comparable rates as whites;[12, 14, 17-19, 58] rectifying this disparity may require more equitable prescribing behavior and/or better adherence support.[59] This disparity was not related to estimated poverty status nor neighborhood poverty. Since 2010, New York State law has required all providers to

link positive patients to care, and the United States Department of Health and Human Services now encourages antiretroviral therapy for all diagnosed persons, regardless of CD4 count, which should further the improvement in suppression rates. Future studies should explore the extent to which persons who can be located for a CSBS interview are representative of persons with HIV in NYC.

Nice paper in general. I do think you could strengthen the overall narration to be a bit more focused as, it seems like you are most interesting in answering the question – does neighborhood social cohesion matter for HIV VL suppression. I think it would be easier for the reader to follow if everything is ultimately about the social cohesion story. What was your power to detect a difference for this variable? I think, if this really is your main variable/exposure of interest, you may want to explore coding it in different ways to see If that has an effect on the results.

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Table 1. Achievement of HIV viral suppression among a stratified random sample of persons newly diagnosed with HIV in New York City in 2006-2012 who were interviewed and followed through June 2014

	Total	Not virologically suppressed within 12 months	Virologically suppressed within 12 months			Median time from diagnosis to suppression	
	Distribution (n)	Distribution (n)	Distribution (n)	Prevalence	*p*-value 1[1]	Median (IQR[2]) days	*p*-value 2[3]
Total	***100.0 (92)***	***100.0 (32)***	***100.0 (60)***	***65.2***		***180 (307)***	
Age group (years) at diagnosis					0.0040		0.0017
13 - 29	33.7 (31)	53.1 (17)	23.3 (14)	45.2		377 (600)	
≥30	66.3 (61)	46.9 (15)	76.7 (46)	75.4		164 (138)	
Sex at birth					0.8810		1.0000
Male	72.8 (67)	71.9 (23)	73.3 (44)	65.7		180 (366)	
Female	27.2 (25)	28.1 (9)	26.7 (16)	64.0		189 (323)	
Race/Ethnicity					0.0085		0.0060
Black or Hispanic	82.6 (76)	96.9 (31)	75.0 (45)	59.2		203 (390)	
Another race/ethnicity	17.4 (16)	3.1 (1)	25.0 (15)	93.8		136 (99)	
Country of birth					0.0165		0.0003
US or US dependency	68.5 (63)	84.4 (27)	60.0 (36)	57.1		218 (428)	
Foreign	31.5 (29)	15.6 (5)	40.0 (24)	82.8		135 (84)	
HIV transmission risk					0.2998		0.5434
Men who have sex with men	51.1 (47)	53.1 (17)	50.0 (30)	63.8		186 (293)	
Heterosexual	31.5 (29)	37.5 (12)	28.3 (17)	58.6		210 (352)	
Other or unknown	17.4 (16)	9.4 (3)	21.7 (13)	81.3		168 (105)	
Year of HIV diagnosis					0.0536		0.2015
2006 - 2009	45.7 (42)	59.4 (19)	38.3 (23)	54.8		200 (768)	
2010 - 2012	54.3 (50)	40.6 (13)	61.7 (37)	74.0		171 (203)	
Eligible for treatment					<0.0001		0.0057

Yes	46.7 (43)	18.8 (6)	61.7 (37)	86.0		159 (119)	
No	53.3 (49)	81.3 (26)	38.3 (23)	46.9		372 (735)	
Estimated poverty status					0.5073		0.1915
Non-poor	39.1 (36)	43.8 (14)	36.7 (22)	61.1		201 (297)	
Poor	60.9 (56)	56.3 (18)	63.3 (38)	67.9		173 (320)	
Perceived neighborhood social cohesion					0.3126		0.0194
Low cohesion	52.2 (48)	59.4 (19)	48.3 (29)	60.4		204 (435)	
High cohesion	47.8 (44)	40.6 (13)	51.7 (31)	70.5		168 (234)	
Percent of population below federal poverty threshold in past 12 months					0.2558		0.0869
Low or medium (<20%)	42.4 (39)	34.4 (11)	46.7 (28)	71.8		171 (312)	
High or very high (≥20%)	57.6 (53)	65.6 (21)	53.3 (32)	60.4		199 (308)	

[1] *p*-value 1: Chi-square or (when cells had expected counts <5) Fisher's exact test of association between each variable and achievement of suppression

[2] IQR: Interquartile range, i.e., 3rd quartile minus 1st quartile

[3] *p*-value 2: Mann-Whitney U test of differences by each variable in median days to suppression

Table 2. Proportional hazards regressions of HIV viral suppression among a stratified random sample of persons newly diagnosed with HIV in New York City in 2006-2012 who were interviewed and followed through June 2014

	HR[1] (95% CI)	AHR[2] (95% CI)
Age group (years) at diagnosis		
13 - 29	0.69 (0.44-1.08)	0.64 (0.38-1.09)
≥30	1.00	1.00
Sex at birth		
Male	0.93 (0.58-1.50)	0.95 (0.57-1.60)
Female	1.00	1.00
Race/Ethnicity		
Black or Hispanic	0.40 (0.23-0.69)	0.45 (0.23-0.86)
Another race/ethnicity	1.00	1.00
Country of birth		
US or US dependency	0.48 (0.30-0.77)	
Foreign	1.00	
HIV transmission risk		
Men who have sex with men	0.94 (0.58-1.50)	
Heterosexual	1.00	
Other or unknown	1.19 (0.63-2.24)	
Year of HIV diagnosis		
2009 - 2009	0.58 (0.37-0.91)	0.63 (0.38-1.05)
2010 - 2012	1.00	1.00
Eligible for treatment		
Yes	1.00	1.00
No	0.45 (0.29-0.70)	0.58 (0.35-0.96)
Estimated poverty status		
Non-poor	0.80 (0.52-1.24)	

Poor	1.00	
Perceived neighborhood social cohesion		
Low cohesion	1.00	1.00
High cohesion	0.99 (0.64-1.51)	0.79 (0.49-1.28)
Percent of population below federal poverty threshold in past 12 months		
Low or medium (<20%)	1.00	1.00
High or very high (≥20%)	0.61 (0.28-1.34)	1.00 (0.98-1.02)

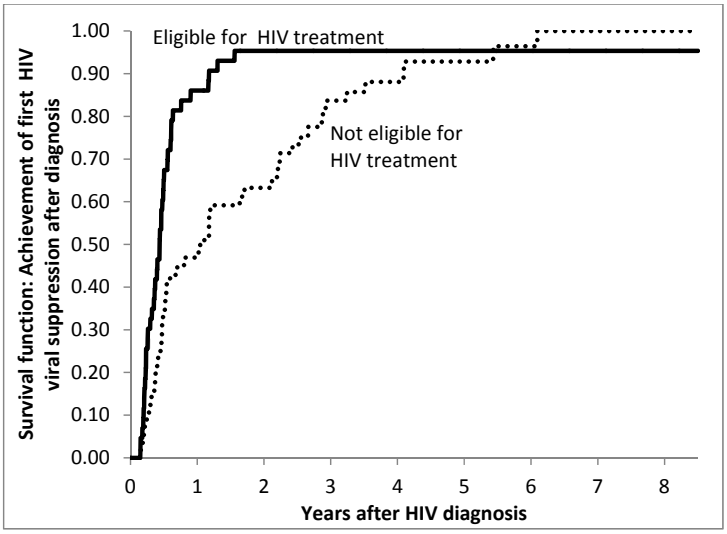
[1] HR: Hazard ratio

[2] AHR: Adjusted hazard ratio

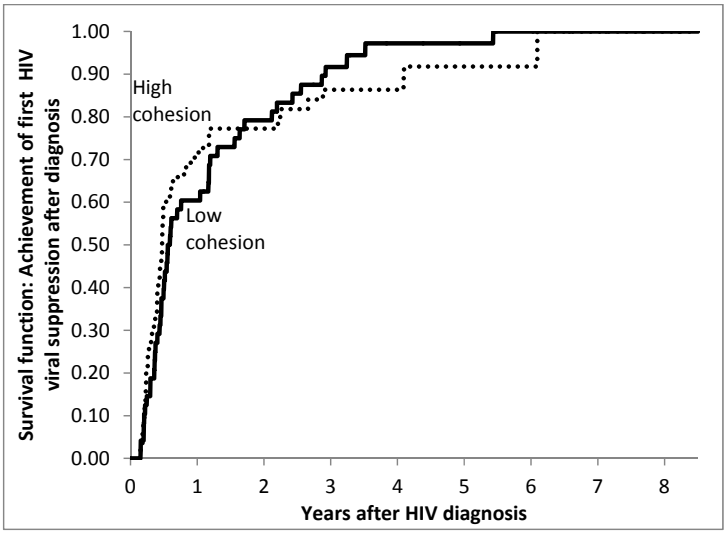
Commented [HJ29]: This is not really that close to 1 – socould be due to low power no?

Figure 1. Kaplan-Meier survival curves of time from HIV diagnosis to viral suppression among a stratified random sample of persons newly diagnosed with HIV in New York City in 2006-2012 who were interviewed and followed through June 2014

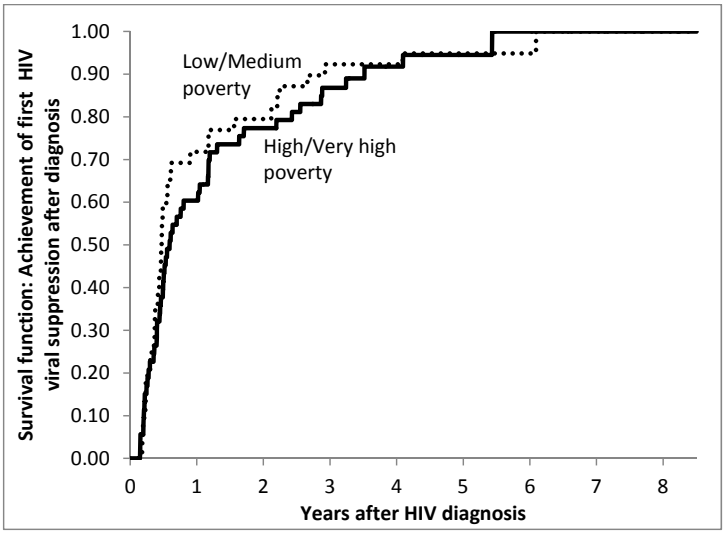
1a. By eligibility for antiretroviral therapy (ART)



1b. By perceived neighborhood social cohesion



1c. By neighborhood-level poverty



Multilevel analysis of individual, neighborhood, and health care facility characteristics associated with achievement and maintenance of HIV viral suppression among persons newly diagnosed with HIV in New York City

by

A dissertation submitted to the Graduate Faculty in Public Health in partial fulfillment of the requirements for the degree of Doctor of Public Health, The City University of New York

2016

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This manuscript has been read and accepted for the Graduate Faculty in Public Health in satisfaction of the dissertation requirement for the degree of Doctor of Public Health.

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Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK

Abstract

Multilevel analysis of individual, neighborhood, and health care facility characteristics associated with achievement and maintenance of HIV viral suppression among persons newly diagnosed with HIV in New York City

By

Adviser: Professor Luisa N. Borrell

[Abstract to be written; no word limit]

Objectives …

Methods …

Results …

Conclusions …

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Chapter 1. Introduction

HIV and viral suppression in the US and NYC

New York City (NYC) is home to more than 7% of all persons newly diagnosed with HIV in the United States (US) each year.[1, 2] It is recommended that persons newly diagnosed with HIV have their viral load (VL) measured as soon as they begin HIV-related medical care and then at least every six months.[3] Acute HIV infection typically is accompanied by very high VL (e.g., >100,000 copies of HIV ribonucleic acid, RNA, per milliliter, mL, of blood) which eventually declines to a lower set point that varies by individual. Reduction to low or undetectable levels (e.g., ≤400 copies/mL) is called viral suppression and is typically achieved by being treated with antiretroviral therapy (ART).[4] Because of improvements in ART since the mid-1990s, and recommendations that ART should be initiated before persons with HIV become immunocompromised, HIV has been transformed from an almost inevitably fatal disease to a chronic, manageable condition. In addition, because of these changes, viral suppression has become more common than virologic failure (i.e., when VL becomes detectable or reaches a high level), among persons living with HIV or acquired immunodeficiency syndrome (AIDS; PLWHA). Provided that the virus is sensitive to the multi-drug regimen chosen and the person is adherent, ART suppresses virus quickly (within 24 weeks) and durably.[5, 6] Achievement and maintenance of viral suppression, and avoidance of virologic failure, slows progression of HIV disease,[7] and reduces the likelihood of onward sexual transmission.[8] The 2015 goal of the US National HIV/AIDS Strategy is a 20% increase in the proportion of persons virally suppressed within three of the populations most affected by HIV (blacks, Hispanics, and gay and bisexual men).[9] As few as 20% of PLWHA were thought to be suppressed in the US in the early 2000s, while today most estimates exceed 50%;[10-14] in NYC, it was 59% in 2010.[14] During 2006-2009, suppression within 12 months of HIV diagnosis in NYC increased from 36% to 45%, and maintenance of suppression for 12 months (and avoidance of failure) increased over the same period from 79% to 86%.[15]

Summary of the literature and current gaps in knowledge

Epidemiologic literature has explored factors related to viral suppression and virologic failure among persons with HIV. However, studies have rarely examined VL over time or in terms of factors other than individual demographics and clinical characteristics.[15, 16] With respect to time measurement, most published population-level VL statistics, including those with the recent focus on the HIV care continuum, refer only to the most recent VL.[10, 13] A single VL may indicate neither maintenance of suppression (also referred to as sustained suppression) nor virologic failure.[16] The few population-based studies following persons' viral loads over time have found that substantial proportions of those achieving suppression do not maintain it.[15, 17-19] For example, among newly diagnosed New Yorkers achieving suppression, 18% experienced virologic failure within 12 months.[15] I measured time from HIV diagnosis to first viral suppression and time from first suppression to virologic failure, with a follow-up time of up to seven years.

More rapid achievement of suppression, longer maintenance of suppression, and lower failure rates have been associated with individual-level demographic characteristics including older age,[13, 15, 20] male sex,[15, 21-23] non-black race,[13, 15, 24-28] baseline clinical status indicators such as CD4 count and VL,[15, 29, 30], and more recent calendar year of diagnosis.[15] For example, in the CDC's Medical Monitoring Project, among persons with HIV on ART, 79% of males achieved suppression as compared with 71% of females.[13] An analysis among newly diagnosed residents of Seattle and surrounding King County found that blacks had 15% decreased odds of suppression compared with whites, while Hispanics had similar odds as whites.[25]

Studies of achievement and maintenance of suppression may further benefit from the addition of variables describing characteristics of health care facilities where people are diagnosed and receive care as well as neighborhoods where people live. For example, facility characteristics, such as type of clinical setting, accessibility including travel distance, support services offered, and physician experience have been shown to influence intermediary health outcomes among persons with HIV, including receipt of and adherence to ART, both necessary steps for maintenance of viral suppression.[31-35] Specifically, a large sample of US hospitals found lower mortality for patients in dedicated AIDS units relative to those in

hospitals without these units.[36] Studies in developing countries have found that clinic distance from patient residence influences linkage to care, an important precursor to viral suppression.[37] I am not aware of studies examining the effect of facility distance on HIV-related outcomes entirely within a large city in an industrialized nation.

Neighborhood factors such as lower area-level socioeconomic status have been associated with higher rates of diagnosis of HIV or AIDS, delayed care and treatment, and increased mortality.[31, 33, 38-43] Additionally, lower perceived neighborhood social cohesion has been associated with lower primary care use among older urban adults[44] as well as lower condom use and higher STI rates among urban adolescents and young adults[45, 46]. The latter factors (condom use and STI rates) have the potential to influence the time from HIV diagnosis to viral suppression. More broadly, public health researchers have characterized social and structural factors, such as individual- and neighborhood-level poverty, as fundamental drivers of health disparities and encouraged the inclusion of such broader factors in epidemiologic analyses.[47-50] For example, the Alameda County Study was one of the first epidemiologic studies to identify an effect of area-level factors on individual health, and it did so in a general population, not a population of persons with HIV: individual mortality risk was found to be higher among persons living in high-poverty areas than low-poverty areas, even after controlling for factors including individual income.[51] However, few studies on virologic suppression or failure have examined facility or neighborhood characteristics.[31-34] I assessed the impact of facility and neighborhood characteristics on the achievement and maintenance of viral suppression while controlling for individual characteristics.

Individual and facility characteristics associated with achievement and maintenance of viral suppression can now be measured by many HIV surveillance registries[15, 25, 52] and will become increasingly important as more persons with HIV receive ART and achieve suppression. Area-level data aggregated from individual responses to national data sources, such as the US Census and the American Community Survey (ACS), can supplement surveillance data with neighborhood-level variables, and can be matched to individual-level surveillance data by patient residence. I linked data from the US Census and ACS with data from the HIV surveillance registry to conduct these analyses.

Overview of the dissertation

Overall goals

I investigated the effect of individual, health care facility, and neighborhood characteristics on the achievement and maintenance of HIV viral suppression, among New York City residents aged 13 years and older who were diagnosed with HIV between 2006 and 2012. The results may be used to improve public health by identifying groups of persons with lower rates of achievement or maintenance of viral suppression who might benefit from interventions to improve ART initiation and adherence.

Specific aims

The following specific aims were addressed:

AIM 1: Examine the independent effects of individual-, neighborhood- and health care facility-level characteristics on HIV viral suppression, among adults and adolescents in New York City who were newly diagnosed with HIV between 2006 and 2010.

AIM 2: Examine the independent effects of individual-, neighborhood- and health care facility-level characteristics on HIV virologic failure, among adults and adolescents in New York City who were newly diagnosed with HIV between 2006 and 2010.

AIM 3 (exploratory aim): Examine the independent effect of perceived neighborhood social cohesion on HIV viral suppression, among adults in New York City who were newly diagnosed with HIV between 2006 and 2012.

Organization of the dissertation

Following this introduction, the dissertation contains four additional chapters. Chapter 2 assesses the individual, facility, and neighborhood factors associated with achievement of viral suppression after diagnosis among New Yorkers newly diagnosed with HIV in 2006-2010 (Aim 1). Chapter 3 begins with the subset of persons from the previous aim who achieved viral suppression and assesses the individual, facility, and neighborhood factors associated with maintenance of viral suppression (Aim 2). Chapter 4 assesses individual and neighborhood factors, including perceived neighborhood social cohesion,

associated with achievement of viral suppression after diagnosis, among a sample of New Yorkers newly diagnosed with HIV in 2006-2012 (Aim 3). Chapter 5 summarizes findings from aims 1-3 and discusses limitations and strengths of the analyses. Finally, I conclude with policy implications and directions for future research.

Data sources

In this dissertation, I used individual-level data from the NYC HIV surveillance registry and Case Surveillance-Based Sampling,[53] facility-level data from the registry, and Census-tract- and ZIP-code-level data from the 2010 US Census[54] and the 2011 American Community Survey.[55] The registry includes all persons diagnosed with HIV and reported in NYC since 2000 and all persons with AIDS since 1981. It gathers information by medical record review, provider report at diagnosis, and HIV-related laboratory tests, which are electronically reported to surveillance for all newly confirmed and existing cases. With respect to first HIV/AIDS diagnosis date, the concordance of surveillance data with medical records is high (84% of NYC AIDS patients identified via medical record had been reported to the surveillance registry) and with self-report somewhat high (56% of US HIV surveillance-self-report pairs had the same year of diagnosis, and 30% of self-reported dates were an earlier year).[56-58] Surveillance data are also timely, with reportable events typically confirmed and appearing in the registry within several months.[57]

The registry includes individual-level demographic and clinical information collected at the time of first report of HIV diagnosis (Aims 1 and 3) or first VL test indicating suppression (Aim 2), address of residence at diagnosis, and HIV-related laboratory test results from 2006-2012 for all New Yorkers newly diagnosed with HIV. Laboratory reports contain the test type, specimen collection date, result, and submitting provider or facility. Health care facility data from 2006-2012 were obtained from the registry and linked to cases according to the facility diagnosing the patient (Aims 1 and 3) or that conducted the first VL test indicating suppression for each case (Aim 2). Finally, neighborhood data were acquired from the 2010 US Census and the 2011 American Community Survey 5-year estimates. Neighborhood data were geocoded and linked to cases through patient residence at the Census tract level (Aims 1 and 2) or ZIP code level (Aim 3). Case Surveillance-Based Sampling was used for Aim 3, including the main questionnaire of the project and three local, scaled questions about whether people in the patient's

neighborhood of residence were trustworthy, close-knit, or willing to help neighbors. Answers to these three questions were combined to create a composite measure of perceived neighborhood social cohesion.[45]

Outcomes

The outcomes of interest were first viral suppression after diagnosis (Aims 1 and 3) and failure after first suppression (Aim 2). The cut-off for suppression in all three aims was 400 copies/mL because this was the highest (i.e., least-sensitive) lower detectable limit of all VL assays used during the study period.[59] In Aim 2, virologic failure was defined as having a VL ≥1,000 copies/mL or not having any VL test for 12 consecutive months. The 1,000-copy cutoff permitted a temporary blip that would not necessarily signal virologic failure since VL changes easily,[60] and risk of HIV transmission from a person with a VL under 1,000 copies/mL is almost nonexistent.[8, 61] Requiring VL tests every 12 months in order to be considered as maintaining suppression ensured at least minimal engagement in care and provided an endpoint for persons who dropped out of care, since care was required to detect any VL and it was unreasonable to assume that persons who dropped out of care in NYC would remain suppressed. The follow-up period for Aims 1 and 2 ended on 12/31/2012 and for Aim 3 on 6/30/2014.

Study population

Our analysis population was drawn from NYC residents who were newly diagnosed with HIV between 2006 and 2010 (Aims 1 and 2) or between 2006 and 2012 (Aim 3) and were at least 13 or 18 years of age at diagnosis (Aims 1 and 3, respectively) or at least 13 at suppression (Aim 2). Aim 2 was limited to the subset of these persons who achieved viral suppression (≤400 copies/mL) ≥31 days following diagnosis and by 12/31/2012. Aim 3 assessed viral suppression for a much smaller population (hence its exploratory nature), because it drew from a survey of persons sampled from new diagnoses through 2012. These persons' addresses were not geocoded to XY coordinates, so neighborhood-level variables were constructed at the level of ZIP code.

Persons were excluded from the analysis population if their death date appeared to precede their first diagnosis (Aims 1 and 3) or suppression date (Aim 2), their date of HIV diagnosis or viral suppression was potentially misclassified, information about address or neighborhood of residence and facility of diagnosis or suppression was missing, or their address data indicated that they were homeless or

institutionalized. These exclusions yielded an analytic sample of 12,547 persons in Aim 1, 8,927 persons in Aim 2, and 92 persons in Aim 3 (see Appendix 1 and Appendix 2).

Statistical analysis

Descriptive statistics were calculated for selected characteristics at the individual, health care facility, and neighborhood levels and presented for the overall population and according to viral suppression status (Aims 1 and 3) or virologic failure status (Aim 2) within 12 months of diagnosis. The association between each variable and virologic suppression or failure within 12 months was estimated using Chi-square statistics; differences in median days to suppression or failure were assessed using the Mann-Whitney U test.

Kaplan-Meier curves showing the number of days from diagnosis to suppression (Aims 1 and 3) or suppression to failure (Aim 2) were generated for key individual, health care facility, and neighborhood characteristics; log-rank tests were used to assess differences between groups.

Cox proportional hazards regressions estimated the association of individual, facility, and neighborhood-level factors with suppression (Aims 1 and 3) or failure (Aim 2) in crude and adjusted models. When the analytic sample was sufficiently large (Aims 1 and 2), these regressions were multilevel. Specifically, robust sandwich estimation of the standard errors was used to account for correlations of individual outcomes clustered within either facility or neighborhood (Census tract).[62, 63] After estimating unadjusted rates for suppression (Aims 1 and 3) or failure (Aim 2) for each individual, facility, and neighborhood characteristic, models were fitted to estimate the hazards of virologic suppression or failure for each characteristic, after adjustment for other characteristics.

Previous epidemiologic studies of viral suppression have often used survival analysis as their methodology.[15, 29, 64, 65] This time-to-event technique is useful for measuring the amount of time between HIV diagnosis and first achievement of viral suppression. It can also be used to measure the amount of time that suppression is maintained after it is achieved, i.e., until virologic failure. Survival analysis also permits persons to be in the analysis for only part of the study period, even if they enter it after the start date (e.g., they are newly diagnosed with HIV during the follow-up period) or leave before the end date (e.g., they are lost to follow-up before they have the outcome of interest). The multilevel models in Aims 1 and 2 permitted examination of the influence of social and structural (i.e., neighborhood

and facility) factors and of potential mechanisms by which individual factors such as race/ethnicity might be associated with suppression.

Applications of findings

The findings of these analyses may be valuable to agencies planning testing programs, medical care for individuals with HIV, and "prevention with positives" programs. They may also help strengthen existing programs, such as the NYC care coordination program and housing services, which appear to be working,[66, 67] or help explain why other programs may not be working. Findings about neighborhood characteristics associated with shorter time to suppression and longer maintenance of suppression could identify geographic groups of persons in need of additional services. They might also influence future assessments of areas that could benefit from subsidized and/or supportive housing for persons with HIV. Health care facility characteristics associated with shorter time to suppression and longer maintenance of suppression could be examined for their "best practices" and these practices considered either for scale-up across facilities or in recommendations of which types of facilities have the potential to provide the best care. Further analyses could assess how populations with long-term detectable VLs could be offered greater support via facility- and neighborhood-level changes, or how HIV care and services generally could be structured to maximize (a) the linkage of persons with HIV to facilities that have successfully helped patients like them achieve and maintain suppression and (b) the housing of persons with HIV in neighborhoods or other communities with suppression-supporting characteristics.

Ethical considerations

Ethical approval for these analyses was provided by the Institutional Review Boards of Lehman College of the City University of New York and of the New York City Department of Health and Mental Hygiene. Maintenance of confidentiality and privacy of person-level information was a top priority throughout the research process. Among other protections, all person-level data were maintained on computer servers of the New York City Department of Health and Mental Hygiene and analyzed in the Department's HIV Epidemiology and Field Services Program, which conducts HIV surveillance and has numerous facility, technical, electronic, and procedural safeguards to promote security and minimize opportunities for breaches. The doctoral student underwent confidentiality training at the Department,

passed the Basic Course for social and behavioral research with human subjects via the Collaborative Institutional Training Initiative (CITI), and had over 10 years of professional experience working with data in the HIV Epidemiology and Field Services Program, which conducts HIV surveillance.

Chapter 2. Multilevel analysis of individual, health care facility, and neighborhood characteristics associated with achievement of HIV viral suppression among persons newly diagnosed with HIV in New York City

Introduction

New York City (NYC) is home to more than 7% of all persons newly diagnosed with HIV in the United States (US) each year.[1, 2]. It is recommended that persons newly diagnosed with HIV have their viral load (VL) measured as soon as they begin HIV-related medical care and then at least every six months.[3] HIV infection typically is followed by a very high VL (e.g., >100,000 copies of HIV RNA per milliliter of blood) which eventually declines to lower levels that vary by individual. Further reduction of HIV VL to low or undetectable levels (e.g., ≤400 copies/mL) is referred to as viral suppression. Although a small percentage of persons (i.e., “elite controllers") is able to achieve suppression without treatment, most persons achieve suppression by being treated with antiretroviral therapy (ART).[4] Provided that the virus is sensitive to the multi-drug regimen chosen and the person is adherent, ART helps a person achieve suppression quickly (within 24 weeks) and durably.[5, 6]

Viral suppression not only slows progression of HIV disease [7] but also reduces the likelihood of onward sexual transmission.[8] As few as 20% of PLWHA were thought to be suppressed in the US in the early 2000s, while today most estimates exceed 50%;[10-14] in NYC, it was 59% in 2010.[14] In 2010, the US National HIV/AIDS Strategy set as a goal a 20% increase by 2015 in the proportion of persons in populations most affected by HIV (blacks, Hispanics, and gay and bisexual men) who are virally suppressed.[9]

Although retention in care and ART are the main drivers of viral suppression, more rapid achievement of suppression has also been associated with individual-level demographic characteristics (e.g., older age,[13, 15, 20] male sex,[21-23] and non-black racial/ethnic category [13, 24-28]), and baseline clinical status indicators (e.g, CD4 count and VL[15, 29, 30]).

Studies focusing on individual-level factors affecting viral suppression may benefit from the addition of variables describing characteristics of health care facilities in which people are diagnosed, as these characteristics have been shown to influence intermediary health outcomes among persons with HIV.[31-33] For example, facility-level characteristics have been associated with linkage to care after

diagnosis,[35] receipt of ART,[33, 34] and adherence to treatment, all necessary steps toward viral suppression.[32] The type of clinical setting and accessibility of a medical facility including travel distance for patients, as well as the support it offers its patients, can affect adherence.[32] Few studies on viral suppression, however, have included these facility characteristics.[31-33]

Similarly, the relationship between neighborhood-level socioeconomic characteristics and viral suppression has rarely been studied. Lower socioeconomic status has been associated with higher rates of diagnosis of HIV or AIDS, delayed access to treatment, and mortality.[31, 33, 38-43] For example, in a US city, HIV-positive residents of higher-unemployment neighborhoods were less likely to be on ART.[43] Even in a province of Canada, a country with universal health care and free HIV treatment, after controlling for clinical characteristics, it was found that residents of lower-SES neighborhoods (as measured by median income) were less likely than residents of higher-SES neighborhoods to be prescribed the ART regimen that was the standard of care.[33] We therefore investigated the effect of individual, health care facility, and neighborhood characteristics on achievement of viral suppression, among NYC residents ≥13 years of age who were diagnosed with HIV between 2006 and 2010, before and after controlling for selected characteristics.

Methods

Data sources

This retrospective analysis used data from the NYC HIV surveillance registry, the 2010 US Census,[54] and the 2011 American Community Survey.[55] The registry includes all persons diagnosed and reported with HIV in NYC since 2000. It gathers information by medical record review, provider report at diagnosis, and HIV-related laboratory tests, which are electronically reported to surveillance for all existing cases receiving diagnosis and/or care in NYC.

Individual-level data acquired from the registry included demographic and clinical information collected at the time of first report, address of residence at diagnosis, and HIV-related laboratory test results from 2006-2012 for all New Yorkers diagnosed with HIV. Laboratory reports contain the test type, specimen collection date, result, and submitting provider or facility. Reports on existing cases are added to their surveillance registry record; reports not matching an existing case are sent out for field investigation to confirm the diagnosis and collect other registry data. Health care facility data from 2006-

2012 were obtained from the registry and linked to cases according to the facility diagnosing each case with HIV. All registry data were reported as of September 30, 2013. Finally, neighborhood data at the Census tract level were acquired from the 2010 US Census and the 2011 American Community Survey 5-year estimates. Neighborhood data were linked to cases through the Census tract of patient residence, which was geocoded from address of residence to the 2010 Census tract. The process of creating an analytic dataset with individual, facility, and neighborhood data is described in Appendix 3.

Population

NYC residents who were newly diagnosed with HIV between 2006 and 2010 and at least 13 years of age at diagnosis (N=17,825 persons) were excluded if their address could not be geocoded to Census tract (n=2,560), if their facility- or neighborhood-level characteristics were unknown (n=206), if their address of residence and of facility of diagnosis were equivalent, possibly indicating a homeless or institutionalized person (n=471), if they were diagnosed at a correctional facility (n=252), or if they did not survive at least 31 days following diagnosis (n=220). We further excluded 1,569 persons with neither a Western blot confirmatory test within 31 days of diagnosis nor a diagnosis of acute HIV infection (n=716); persons with a detectable (>50 copies/mL) viral load >31 days prior to diagnosis (n=1); and persons with a suppressed (<400 copies/mL) viral load <31 days following diagnosis, values that indicate either elite controllers or previous use of ART (n=852). These exclusions yielded an analytical sample of 12,547 persons (see Appendix 1).

Outcome

The outcome of interest was the first suppressed VL (≤400 copies of HIV RNA/mL plasma) after HIV diagnosis. The cut-off was 400 copies/mL because this was the highest lower detectable limit of all VL assays in use during the study period.[59] Persons were censored at death or the end of the follow-up period, whichever came earlier. Follow-up time was calculated as the number of days from the date of HIV diagnosis to suppression, death, or 12/31/2012, whichever came first.

Treatment guidelines evolved during the analysis period but recommended VL tests between 2-4 times per year after HIV diagnosis. However, some persons with HIV may have had infrequent or no VL tests after diagnosis, because they were never linked to HIV-related medical care, they sought care infrequently, or their physician did not test their VL at every care visit. Persons who were not known to be

dead and who had no suppressed VL (including persons with infrequent or no VL tests) were presumed not to be suppressed and contributed follow-up time as long as they were alive.

Covariates

Individual-level variables

Demographic characteristics (age, sex at birth, race/ethnicity, area of birth), HIV transmission risk (also referred to as transmission categories), diagnosis date, viral loads, CD4 counts, and address of residence at diagnosis were extracted from the NYC HIV surveillance registry. Age at HIV diagnosis was calculated from birth date and date of diagnosis and categorized as 13-19, 20-29, 30-39, 40-49, 50-59, and 60+.[2] Sex at birth was classified as male or female. Race was collected as white or Caucasian, black or African American, Asian or Pacific Islander, and Native American. Ethnicity was collected as Hispanic, non-Hispanic, or unknown. Race and ethnicity were combined into a single variable in which all persons of Hispanic ethnicity were classified as Hispanic, and non-Hispanics were classified as black, white, or other non-Hispanic race (which included Asians and Pacific Islanders, Native Americans, and multiracial persons).[15] Area of birth was collected as country of birth when available or region of birth and categorized as born in the US, US dependency (e.g., Puerto Rico), foreign country, or unknown place of birth.[68] HIV transmission risk category was based on the self-reported pre-diagnosis risk behaviors of the case (e.g., injection drug use, male-male sex) and the sex, HIV status (e.g., HIV-positive), and risk (e.g., injection drug use) of the pre-diagnosis heterosexual-sex partners that s/he reports (which could indicate high-risk heterosexual risk).[69] This information was combined into hierarchical, mutually exclusive categories for the case: injection drug use (IDU), men who have sex with men (MSM), heterosexual sex, and other or unknown (which included perinatal transmission).[15] To be classified as a heterosexual male or female, persons must have reported pre-diagnosis sex with a partner of the other sex who was HIV-infected, had injected drugs, or had received blood products. In addition, females only could be classified as heterosexual if they had probable heterosexual transmission noted in their medical record, reported sex with a male and no history of drug injection, or had any one of several behaviors associated with heterosexual transmission: history of prostitution, multiple sex partners, sexually transmitted disease, crack/cocaine use, or sex with a bisexual male.[2] For analytic purposes, the year of diagnosis was determined from the earlier of physician diagnosis date or positive Western blot test result (2006, 2007, 2008, 2009, 2010). CD4 count (if any) at diagnosis (i.e., within 3 months of diagnosis) and

year of diagnosis vis-à-vis treatment guidelines were used to estimate treatment eligibility and as a proxy for receipt of ART, on the presumption that the majority of persons reaching the federal treatment threshold would be offered and receiving ART. Treatment-eligible persons included those diagnosed in 2006-2007 and with CD4<200, diagnosed in 2008-2009 and with CD4<350, or diagnosed in 2010 and with CD4<500, reflecting changing treatment guidelines that increased the CD4 count at which ART initiation was recommended.[70-72] All other persons, including those with no reported CD4 counts, were not known to be eligible and were classified as not eligible.

Health care facility-level variables

Facility-level characteristics include annual HIV patient volume, facility type, and patient-facility distance. HIV patient volume was collected as number of new HIV diagnoses made annually, based on diagnoses attributed by surveillance to that facility in the year of the patient's diagnosis, and categorized as <10, 10-24, 25-49, 50-74, and ≥75 diagnoses per year.[33, 73] Facility type was categorized as inpatient/hospital, private provider, other outpatient facility, screening/diagnosis/referral facility, and other or unknown (<10 persons had a known facility but unknown type), as potential indicators of the availability of colocated care (at the first three facility types) [35] and ancillary services (at the first and third types) [32]. Patient-facility distance was calculated as the distance in miles along NYC streets from patient residence to the facility of diagnosis (based on the XY coordinates of each) using Network Analyst in ArcMap 10.0 (ESRI, Redmonds, CA) (see Appendix 4). This distance was categorized as <1 mile, 1-<5 miles, 5-<10 miles, and ≥10 miles.

Neighborhood-level variables

Analyses included two Census tract-level SES measures from 2011 American Community Survey (ACS) 5-year estimates, which is the recommended source for such statistics because the 2010 decennial census did not collect them.[74] These measures, which previously have been associated with HIV or sexually transmitted infections or HIV outcomes, were percent of residents with incomes under federal poverty threshold,[31, 33, 39, 40, 47, 75] and percent unemployed among residents 16+,[31, 39, 41, 75] Census 2010 provided data on percent of non-Hispanic black residents, as it is the recommended data source for population race/ethnicity statistics. [74] The values for percent unemployed and percent black were divided by 10 and entered into a proportional hazards regression as continuous variables; measures of association would therefore be for 10-percentage-point differences. Poverty was

categorized as 0 to <10% (low-poverty), 10 to <20% (medium-poverty), 20 to <30% (high-poverty), and 30 to 100% (very-high-poverty), based on recommendations of the NYC health department.[76] This particular set of three neighborhood-level variables (poverty, unemployment, and percent black) has been used previously.[43]

Statistical analysis

Descriptive statistics were calculated for selected characteristics at the individual, health care facility, and neighborhood levels and presented for the overall population and according to suppression status within 12 months (365 days) of diagnosis. The association between each variable and achievement of suppression within 12 months was measured using Chi-square tests. The Mann-Whitney U test was used to ascertain differences in median days to suppression by the end of the follow-up period.

Kaplan-Meier curves showing the number of days from diagnosis to suppression were generated by key individual and health care facility characteristics, and log-rank tests were used to indicate differences between groups.

We used Cox proportional hazards regressions to estimate the association of individual, facility, and neighborhood-level factors with suppression in crude and adjusted models. Robust sandwich estimation of the standard errors was used to account for correlations of individual outcomes clustered within either facility of diagnosis or neighborhood (Census tract).[62, 63] Unadjusted models were fitted to estimate the unadjusted hazards of viral suppression for each individual, facility, and neighborhood characteristic. In addition, several models were fitted. First, hazards of viral suppression for each individual characteristic were estimated after adjustment for all other individual characteristics. Second, models were fitted to estimate the hazards for each facility and each neighborhood characteristic, after controlling for individual characteristics. Finally, two models were fitted to estimate the adjusted hazards for 1) all individual and facility characteristics and 2) all individual and neighborhood characteristics.

All analyses were conducted using SAS 9.2 (SAS Institute, Cary, NC). Ethical approval for these analyses was provided by the Institutional Review Boards of Lehman College of the City University of New York and of the NYC Department of Health and Mental Hygiene.

Results

Descriptive statistics

Of 12,547 New Yorkers newly diagnosed with HIV in 2006–2010, approximately three-quarters were 20-49 years old (78.7%), male (74.2%), and black or Hispanic (81.5%; Table 2.1). In addition, approximately half were US-born (53.5%) and MSM (44.5%), and about one-third were eligible to receive treatment based on CD4 and diagnosis year (30.6%). Forty-four percent of the population achieved suppression within 12 months of diagnosis. Those who did not suppress within 12 months were more likely to be younger, black, US-born, MSM or IDU, diagnosed in earlier years, and not eligible for treatment.

Almost three-quarters of the population (72.8%) achieved viral suppression by 12/31/2012 (not shown), in a median of 245 days (Table 2.1). Suppression happened least quickly among persons who were younger, diagnosed in earlier years, and not known to be eligible for treatment; differences were most prominent by treatment eligibility (127 days among eligible vs. 415 days among not eligible), differences also demonstrated in Kaplan-Meier survival curves (p<0.0001; Figure 2.1a).

Approximately half of the population was diagnosed in facilities that diagnosed 10-74 persons (45.0%), were hospitals (42.7%), and were 1 to <5 miles from their home (51.0%; Table 2.2); and lived in neighborhoods where ≥20% of the population was below the poverty threshold (i.e., high or very high poverty; 58.0%). Neighborhoods where people lived had a mean unemployment rate of 10.8%, and black persons comprised a mean of 34.3% of the population.

When compared to persons achieving suppression within 12 months of diagnosis, those who did not achieve it were more likely to be diagnosed at facilities that diagnosed fewer persons with HIV, were screening or outpatient facilities, and were ≥10 miles from the patient's residence (Table 2.2); differences in suppression by the first two characteristics were also visible in Kaplan-Meier survival curves (Figures 2.1b and 2.1c). Suppression happened least quickly among persons diagnosed at non-hospital facilities and facilities farther from the patient's residence.

Modelling individual characteristics

Table 2.3 presents the unadjusted and adjusted HRs for individual characteristics on HIV viral suppression among persons newly diagnosed with HIV in NYC. The unadjusted HRs show that persons who were younger, male, black, US-born or MSM were at least 7% less likely to achieve viral suppression

(range 7% to 43%). The same decrement applied to those diagnosed before 2010 and those who were not treatment-eligible.

After adjusting for individual characteristics, the likelihood of viral suppression was 16-29% lower for persons 13-49 years old relative to those 60 and older (e.g., 20-29 years old, 24%[95%CI=0.67-0.86]) and 10% (95%CI=0.83-0.97) lower among men than women. Blacks and Hispanics were 19% (95%CI=0.76-0.86) and 12% (95%CI=0.82-0.94) less likely to suppress than their white counterparts. US-born persons were 8% (95%CI=0.87-0.97) less likely to suppression than foreign-born, and persons diagnosed in 2006 and 2008 were at least 11% (e.g., 2006, 11%[95%CI=0.83-0.96]) less likely to suppress than persons diagnosed in 2010. Compared with heterosexuals, MSM went from being less likely (in crude models) to as or more likely (in models adjusting for other individual characteristics) to suppress (AHR[95%CI]=1.08[1.00-1.17]). Finally, persons not eligible for treatment were 65% less likely than treatment-eligible persons to suppress, presumably because treatment-eligible persons were more likely to have been prescribed ART, almost the exclusive means of lowering viral load. These findings remained nearly identical when adjusting for either facility or neighborhood characteristics (AHRs 2 and 3 in Table 2.3).

Modelling facility and neighborhood characteristics

Table 2.4 presents the unadjusted and adjusted HRs for facility and neighborhood characteristics on HIV viral suppression among persons newly diagnosed with HIV in NYC. The unadjusted HRs show that persons diagnosed at facilities diagnosing <10 patients per year or that were a type other than a hospital were at least 10% less likely to achieve viral suppression (range 10% to 38%; e.g., outpatient facilities, 25% [95%CI=0.71-0.79]). At facilities 1 to <5 miles from the patient vs. <1 mile, 8% more likely (95%CI=1.02-1.14). Although marginally significant, each 10% increase in the proportion of neighborhood residents that was unemployed or black was associated with, respectively, a 5% (95%CI=0.92-0.99) and 1% (95%CI=0.98-0.99) lower likelihood of suppression.

After adjusting for individual characteristics alone, and then individual characteristics as well as either facility or neighborhood characteristics, facility-related findings remained similar as in the bivariate models, with the exception of persons diagnosed at private physicians becoming more likely to achieve suppression (when controlling for both individual and facility characteristics, AHR[95%CI]=1.08[0.95-1.22]). The model with all individual- and facility-level variables had the best fit (-2LL: 158,585; p<0.0001

vs. the model with all individual-level variables only; see Appendix 5). Neighborhood characteristics were no longer associated with suppression in models adjusted for individual characteristics.

Discussion

Controlling for individual and facility characteristics, persons who were younger, male, non-white, US-born, non-MSM, diagnosed in earlier years, and not eligible for treatment took longer to achieve HIV viral suppression after diagnosis. Persons diagnosed at facilities that diagnosed relatively few patients or that were screening, diagnosis, and referral sites also took longer to suppress. Neighborhood-level characteristics did not influence the time from diagnosis to viral suppression.

Our findings about individual and facility characteristics were consistent with the literature. Individual-level factors associated with suppression were similar to a previous study using NYC HIV surveillance data.[15] After adjustment for other individual characteristics, MSM went from having slower suppression than heterosexuals to as quickly or quicker. One possible explanation is that newly diagnosed MSM were younger, healthier, and less likely to be eligible for ART than heterosexuals, but compared with heterosexuals, MSM had equivalent or better treatment access generally and/or adherence once on ART. However, our findings provided unique information about teenagers, who have been included in few prior analyses of viral suppression. Our analysis found teenagers to have, relative to persons ≥60 years old, similarly reduced rates of suppression as persons in their 20s. Teenagers are known to face challenges linking to care after diagnosis, being retained in care, and adhering to ART to achieve suppression;[77, 78] these age-related disparities are not entirely attributable to teenagers being in an earlier stage of disease than older persons. Persons diagnosed at facilities that diagnosed fewer patients or that only screened, diagnosed, and referred patients had lower rates of suppression than persons diagnosed elsewhere. It is possible that these facilities were less likely to provide on-site HIV-related medical care or services for retention, adherence, and case management, which have been shown to facilitate linkage after diagnosis[35] and retention in care;[79, 80] or because their providers are less likely to adhere to HIV-related care recommendations.[81]

Findings about neighborhood characteristics were not consistent with the scant literature on their relationship with HIV outcomes. While neighborhood-level socioeconomic factors have been associated with HIV diagnosis rates in NYC and elsewhere, and some care-related outcomes,[31, 33, 38-42] in our

analysis, neighborhood characteristics were not associated with time to suppression once diagnosed. Several possible explanations include different outcomes (e.g., time from ART initiation to suppression vs. time from diagnosis to suppression) and different settings (e.g., Canada vs. US, or other US areas vs. NYC). Accessible, effective HIV care is perhaps available regardless of characteristics of the NYC neighborhood in which people live, mitigating neighborhood-level disadvantage after diagnosis. Finally, publication bias may have limited the publication of previous null findings on neighborhood characteristics and HIV outcomes.[82, 83]

Being diagnosed at a facility 1 to <5 miles from one's residence was also associated with quicker suppression relative to ≥10 miles away, suggesting that proximity may be important, although interestingly persons diagnosed at facilities within one mile of their residences did not share this advantage. These were not known to be institutionalized persons, who were excluded from the analysis because their outcomes might be influenced by neighborhood and facility differently than non-institutionalized persons. Rather, perhaps facilities <1 mile from persons' residences were disproportionately (a) offices of their regular (i.e., pre-HIV-infection) primary care physicians and/or (b) selected for convenience. In either case, staff may have had less expertise in managing HIV or making effective linkages to HIV specialty care. This hypothesis is feasible if these factors are independent from patient volume and facility type, which were controlled for. Unfortunately, we did not know the mode of transportation nor time required to get to the facility, which may at least partially explain why persons <1 mile from their facilities did not experience quickest suppression. An analysis on correlates of the distance that persons with HIV in another Northeast US city, Philadelphia, travel for care found that greater patient distance from the nearest care site was associated with non-achievement of viral suppression, among persons who had been retained.[84] However, distance was not associated with progression along other parts of the continuum of HIV-related medical care, from diagnosis to retention.[10, 13, 84] That difference in the analyses (where ours followed persons from diagnosis to suppression and theirs from retention to suppression) may account for the different findings.

Limitations

As in any population-based analysis of HIV care, ours had VL data only when persons sought care, which was at their discretion. Persons in this analysis were not necessarily tested at regular intervals and may have achieved suppression sometime before it was measured in a VL test. It is not

clear whether these circumstances would have over- or underestimated our hazard ratios. However, most persons in the analysis (88%) had at least one VL test between 8 days post-diagnosis and death (Appendix 6). Among that 88%, persons diagnosed in 2006, with the most follow-up, had a median of 17 VL tests (IQR: 10-23) and the median interval between tests was 120 days (4 months; IQR: 95-182 days), while persons diagnosed in 2010 had a median of 8 tests (IQR: 5-10) and the median interval between tests was 101 days (3 months; IQR: 85-139 days). These estimates indicate that the majority of New Yorkers newly diagnosed with HIV between 2006 and 2010 were engaged in care at intervals that were both consistent with federal guidelines and sufficiently frequent to produce population-level estimates of suppression.

Persons not in care in NYC were presumed to be present and unsuppressed, although they may have moved out of NYC and become suppressed elsewhere. Non-ascertainment of outmigration is a typical limitation of local HIV surveillance data. An analysis of mobility among NYC AIDS cases who died found that males, whites, MSM, and younger persons were more likely to have left the city;[85] it is possible that the same demographic and risk groups are more likely to leave NYC shortly after HIV diagnosis and thus have undetected suppression. All of these circumstances increase the apparent time to suppression overall, and higher outmigration in some groups could result in differential underascertainment of suppression. This may have overestimated the male-female disparity in suppression rates (i.e., made the HR for males lower) but underestimated disparities by race/ethnicity and risk (i.e., decreased the HRs for white and MSM), since whites and MSM were most likely, in multivariable models, to achieve suppression.

We note that a newly diagnosed person who is in NYC but not in care and not getting blood drawn for viral load tests cannot receive ART by prescription and therefore is unlikely to be suppressed; as such, there is likely little underascertainment of suppression among persons actually in NYC. Additionally, newly diagnosed persons were known to be in NYC as recently as their diagnoses, if not at later points of care, and thus have had relatively little time to leave NYC. Further, the system of care and services, comparatively generous benefits, and large HIV-positive population in NYC make it a relatively attractive place for HIV-positive persons to live and receive care.

There are several steps between diagnosis and suppression in the continuum of care for HIV-positive persons.[10, 13] By design, this analysis did not elucidate the exact step(s) at which facility-level factors affect suppression. Other analyses have investigated the role of facility or health care services in intermediate steps in the continuum, such as time from diagnosis to linkage,[35, 86] continuous care or retention in care,[79, 80, 87] and ART use and suppression among persons in care.[88]

Characteristics measured at one level may have acted at another level. For example, poverty was measured at the neighborhood level only and was found not to be significantly associated with suppression. It is possible that there is no association between individual-level poverty, which we could not measure, and suppression, or alternatively, that individual-level poverty would in fact have been associated with suppression. This limitation is not unique to our analysis but rather is a characteristic shortcoming of multilevel analyses.[89, 90]

Strengths

This is among the first analyses in the US to investigate the influence of facility and neighborhood on HIV outcomes using surveillance data. [31, 33, 35, 87] The data were drawn from population surveillance in the largest HIV epidemic in the US, in a diverse US city. It combined data from multiple sources to assess the potential influence on viral suppression of factors beyond the individual. Mandatory electronic reporting of laboratory tests in NYC provided information about all measured VLs for all HIV-positive persons receiving care in NYC, as opposed to in a clinical trials environment, where findings can differ from those in a population setting. We filled a gap in the literature by including teenagers, who are subject to the same treatment guidelines as adults but whose young age may have contributed to slower suppression than among older persons.[78] To assign area-based characteristics to individuals, we used patient address geocoded to the Census tract, which is the gold standard for detection of public health disparities;[47] other geographic analyses of HIV care outcomes have used only counties and ZIP codes, which are much larger than Census tracts.

Conclusions

We have identified individual and facility characteristics that seem to help persons newly diagnosed with HIV to achieve viral suppression, thus improving their health and preventing ongoing HIV transmission. Those persons or health care facilities with characteristics associated with slower achievement of suppression may need more assistance after diagnosis with linkage to and retention in

care or ART prescribing and adherence. For example, black persons may benefit from more-frequent medical care and prescription of ART that permits them to become suppressed at comparable rates as whites;[15, 22, 25-27, 91] rectifying this disparity may require more equitable prescribing behavior and/or better adherence support.[92] NYC can continue to encourage HIV testing at large facilities, including hospitals, where patients have the greatest likelihood of reaching suppression quickly. We can also increase the capacity of facilities that make fewer diagnoses annually, or that are neither hospitals nor private physicians' offices, to move their patients along the continuum of care from diagnosis to suppression, even if this means ensuring effective linkage to care at another site that has cared for more HIV-positive patients. Since 2010, New York State law has required all providers to link positive patients to care, and the United States Department of Health and Human Services now encourages antiretroviral therapy for all diagnosed persons, regardless of CD4 count, which should further the improvement in suppression rates. Future studies should monitor whether facility-level disparities in suppression decrease over time, as more facilities presumably adhere to the law.

Table 2.1. Achievement of HIV viral suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012, by individual-level characteristics

	Total	Not virologically suppressed within 12 months	Virologically suppressed within 12 months			Median time from diagnosis to suppression	
	Distribution (n)	Distribution (n)	Distribution (n)	Prevalence	*p*-value[1]	Median (IQR[2]) days	*p*-value[3]
Total	***100.0 (12,547)***	***100.0 (7,031)***	***100.0 (5,516)***	***44.0***		***245 (532)***	
Age group (years) at diagnosis					<0.0001		<0.0001
13 – 19	4.7 (590)	5.8 (405)	3.4 (185)	31.4		436 (772)	
20 – 29	27.9 (3,497)	30.9 (2,172)	24.0 (1,325)	37.9		339 (633)	
30 – 39	26.2 (3,290)	26.6 (1,868)	25.8 (1,422)	43.2		255 (551)	
40 – 49	24.6 (3,087)	23.1 (1,627)	26.5 (1,460)	47.3		210 (453)	
50 – 59	12.0 (1,502)	10.0 (701)	14.5 (801)	53.3		178 (334)	
≥60	4.6 (581)	3.7 (258)	5.9 (323)	55.6		150 (228)	
Sex at birth					0.0009		<0.0001
Male	74.2 (9,309)	75.3 (5,297)	72.7 (4,012)	43.1		263 (550)	
Female	25.8 (3,238)	24.7 (1,734)	27.3 (1,504)	46.4		206 (463)	
Race/Ethnicity					0.0009		0.0003
Black	49.1 (6,162)	50.5 (3,552)	47.3 (2,610)	42.4		236 (533)	
Hispanic	32.3 (4,058)	31.6 (2,223)	33.3 (1,835)	45.2		248 (515)	
White	15.2 (1,912)	14.9 (1,049)	15.6 (863)	45.1		285 (568)	
Other	3.3 (415)	2.9 (207)	3.8 (208)	50.1		186 (367)	
Country of birth					<0.0001		<0.0001
US	53.5 (6,713)	56.9 (4,002)	49.1 (2,711)	40.4		291 (592)	
US Dependency	4.5 (565)	4.4 (312)	4.6 (253)	44.8		234 (475)	
Foreign	31.5 (3,951)	27.7 (1,947)	36.3 (2,004)	50.7		194 (401)	
Unknown	10.5 (1,318)	11.0 (770)	9.9 (548)	41.6		263 (566)	

HIV transmission risk					<0.0001		<0.0001
Men who have sex with men	44.5 (5,580)	46.0 (3,236)	42.5 (2,344)	42.0		304 (606)	
Injection drug use history	5.2 (653)	5.4 (380)	4.9 (273)	41.8		273 (524)	
Heterosexual	25.5 (3,198)	23.8 (1,672)	27.7 (1,526)	47.7		206 (461)	
Other or unknown	24.8 (3,116)	24.8 (1,743)	24.9 (1,373)	44.1		202 (440)	
Year of HIV diagnosis					<0.0001		<0.0001
2006	20.5 (2,570)	22.6 (1,587)	17.8 (983)	38.2		363 (935)	
2007	20.5 (2,569)	22.2 (1,559)	18.3 (1,010)	39.3		326 (661)	
2008	21.0 (2,641)	21.3 (1,496)	20.8 (1,145)	43.4		245 (550)	
2009	19.8 (2,486)	18.8 (1,320)	21.1 (1,166)	46.9		211 (380)	
2010	18.2 (2,281)	15.2 (1,069)	22.0 (1,212)	53.1		170 (255)	
Eligible for treatment					<0.0001		<0.0001
Yes	30.6 (3,834)	14.5 (1,016)	51.1 (2,818)	73.5		127 (141)	
No	69.4 (8,713)	85.5 (6,015)	48.9 (2,698)	31.0		415 (708)	

[1] *p*-value: Chi-square test of association between each variable and achievement of suppression

[2] IQR: Interquartile range, i.e., 3rd quartile minus 1st quartile

[3] *p*-value: Mann-Whitney U test of differences by each variable in median days to suppression

Table 2.2. Achievement of HIV viral suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012, by characteristics of the health care facility at which persons were diagnosed and the neighborhood (Census tract) persons were living in at diagnosis

	Total	Not virologically suppressed within 12 months	Virologically suppressed within 12 months			Median time from diagnosis to suppression	
	Distribution (n) or Mean (SD)	Distribution (n)	Distribution (n)	Prevalence	*p*-value[1]	Median (IQR[2]) days	*p*-value[3]
Total	***100.0 (12,547)***	***100.0 (7,031)***	***100.0 (5,516)***	***44.0***		***245 (532)***	
Facility-level variables							
Number of HIV diagnoses made annually by health care facility that diagnosed patient					0.0007		0.1165
<10	33.2 (4,169)	34.1 (2,396)	32.1 (1,773)	42.5		256 (566)	
10 to 24	13.9 (1,741)	13.9 (974)	13.9 (767)	44.1		235 (454)	
25 to 49	16.5 (2,073)	17.2 (1,208)	15.7 (865)	41.7		265 (582)	
50 to 74	14.6 (1,828)	14.3 (1,004)	14.9 (824)	45.1		219 (486)	
≥75	21.8 (2,736)	20.6 (1,449)	23.3 (1,287)	47.0		245 (507)	
Type of facility that diagnosed patient					<0.0001		<0.0001
Hospital	42.7 (5,358)	37.9 (2,668)	48.8 (2,690)	50.2		195 (405)	
Outpatient	22.8 (2,865)	25.2 (1,769)	19.9 (1,096)	38.3		315 (606)	
Private physician	18.6 (2,332)	18.2 (1,283)	19.0 (1,049)	45.0		261 (567)	
Screening/diagnosis/referral	13.9 (1,743)	16.3 (1,148)	10.8 (595)	34.1		350 (636)	
Other or unknown	2.0 (249)	2.3 (163)	1.6 (86)	34.5		253 (573)	
Distance between patient and facility					<0.0001		0.0002
<1 mile	21.4 (2,683)	22.3 (1,569)	20.2 (1,114)	41.5		266 (579)	

1 to <5 miles	51.0 (6,398)	49.1 (3,452)	53.4 (2,946)	46.0		225 (495)	
5 to <10 miles	20.0 (2,509)	20.3 (1,428)	19.6 (1,081)	43.1		273 (524)	
≥10 miles	7.6 (957)	8.3 (582)	6.8 (375)	39.2		280 (568)	
Neighborhood-level variables							
Percent of population below federal poverty threshold in past 12 months					0.0304		0.1715
Low (<10%)	15.9 (1,992)	15.4 (1,081)	16.5 (911)	45.7		228 (482)	
Medium (10 to <20%)	26.1 (3,280)	25.9 (1,821)	26.5 (1,459)	44.5		245 (517)	
High (20 to <30%)	25.1 (3,153)	24.8 (1,745)	25.5 (1,408)	44.7		234 (515)	
Very high (≥30%)	32.9 (4,122)	33.9 (2,384)	31.5 (1,738)	42.2		267 (571)	
Unemployment rate among population 16 years and over	10.8 (5.6)	-	-	-	N/A	-	N/A
Percent of population that is black or African American only (non-Hispanic)	34.3 (29.2)	-	-	-	N/A	-	N/A

[1] *p*-value: Chi-square test of association between each variable and achievement of suppression

[2] IQR: Interquartile range, i.e., 3rd quartile minus 1st quartile

[3] *p*-value: Mann-Whitney U test of differences by each variable in median days to suppression

Table 2.3. Proportional hazards regressions of HIV viral suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012, by individual-level characteristics

	HR (95% CI)[1]	AHR 1 (95% CI)[1,2]	AHR 2 (95% CI)[1,3]	AHR 3 (95% CI)[1,4]
Age group (years) at diagnosis				
13 - 19	0.57 (0.49-0.65)	0.71 (0.61-0.83)	0.75 (0.64-0.86)	0.71 (0.61-0.83)
20 - 29	0.64 (0.57-0.72)	0.76 (0.67-0.86)	0.79 (0.69-0.90)	0.76 (0.67-0.86)
30 - 39	0.69 (0.61-0.77)	0.78 (0.69-0.88)	0.80 (0.71-0.90)	0.78 (0.69-0.88)
40 - 49	0.76 (0.67-0.85)	0.84 (0.74-0.94)	0.85 (0.76-0.95)	0.84 (0.74-0.94)
50 - 59	0.88 (0.78-1.00)	0.94 (0.83-1.06)	0.95 (0.84-1.08)	0.94 (0.83-1.06)
≥60	1.00	1.00	1.00	1.00
Sex at birth				
Male	0.93 (0.89-0.97)	0.90 (0.83-0.97)	0.90 (0.83-0.97)	0.89 (0.83-0.97)
Female	1.00	1.00	1.00	1.00
Race/Ethnicity				
Black	0.83 (0.78-0.88)	0.81 (0.76-0.86)	0.84 (0.79-0.90)	0.81 (0.75-0.87)
Hispanic	0.94 (0.88-1.00)	0.88 (0.82-0.94)	0.91 (0.85-0.98)	0.87 (0.81-0.94)
White	1.00	1.00	1.00	1.00
Other	1.03 (0.90-1.18)	0.89 (0.77-1.03)	0.91 (0.79-1.05)	0.89 (0.77-1.03)
Country of birth				
US	0.84 (0.81-0.88)	0.92 (0.87-0.97)	0.92 (0.87-0.98)	0.92 (0.87-0.97)
US Dependency	0.95 (0.86-1.06)	0.98 (0.88-1.10)	0.99 (0.88-1.10)	0.98 (0.88-1.10)
Foreign	1.00	1.00	1.00	1.00
Unknown	0.80 (0.74-0.86)	0.88 (0.81-0.95)	0.87 (0.79-0.95)	0.88 (0.81-0.95)
HIV transmission risk				
Men who have sex with men	0.93 (0.88-0.97)	1.08 (1.00-1.17)	1.11 (1.02-1.19)	1.09 (1.00-1.18)
Injection drug use history	0.87 (0.79-0.96)	0.92 (0.82-1.02)	0.93 (0.84-1.04)	0.92 (0.82-1.02)
Heterosexual	1.00	1.00	1.00	1.00
Other or unknown	0.83 (0.78-0.88)	0.86 (0.79-0.93)	0.86 (0.79-0.93)	0.86 (0.79-0.93)

Year of HIV diagnosis				
2006	0.67 (0.63-0.72)	0.89 (0.83-0.96)	0.87 (0.81-0.95)	0.89 (0.83-0.95)
2007	0.71 (0.67-0.76)	0.94 (0.87-1.01)	0.92 (0.85-1.00)	0.94 (0.87-1.01)
2008	0.74 (0.70-0.80)	0.87 (0.81-0.93)	0.86 (0.79-0.93)	0.87 (0.81-0.93)
2009	0.84 (0.79-0.90)	1.02 (0.95-1.10)	1.02 (0.95-1.10)	1.02 (0.95-1.10)
2010	1.00	1.00	1.00	1.00
Eligible for treatment				
Yes	1.00	1.00	1.00	1.00
No	0.34 (0.32-0.36)	0.35 (0.33-0.37)	0.36 (0.34-0.38)	0.35 (0.33-0.37)

[1] Hazard ratios and confidence intervals for models with only individual- or neighborhood-level variables account for clustering by Census tract, and those with facility-level variables account for clustering by facility of diagnosis. Hazard ratios (HR) are unadjusted unless indicated as "AHR."

[2] Adjusted hazard ratio 1: For each individual-level variable, adjusting for all other individual-level variables

[3] Adjusted hazard ratio 2: For all individual-level variables, adjusting for all facility-level variables

[4] Adjusted hazard ratio 3: For all individual-level variables, adjusting for all neighborhood-level variables

Table 2.4. Proportional hazards regressions of HIV viral suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012, by characteristics of the health care facility at which persons were diagnosed and the neighborhood (Census tract) persons were living in at diagnosis

	HR (95% CI)[1]	AHR 1 (95% CI)[1,2]	AHR 2 (95% CI)[1,3]	AHR 3 (95% CI)[1,4]
Facility-level variables				
Number of HIV diagnoses made annually by health care facility that diagnosed patient				
<10	0.85 (0.80-0.90)	0.93 (0.85-1.01)	0.90 (0.81-1.01)	
10 to 24	0.82 (0.77-0.88)	0.85 (0.76-0.95)	0.87 (0.79-0.95)	
25 to 49	0.83 (0.78-0.89)	0.85 (0.77-0.93)	0.85 (0.78-0.92)	
50 to 74	0.87 (0.81-0.93)	0.88 (0.81-0.95)	0.87 (0.80-0.94)	
≥75	1.00	1.00	1.00	
Type of facility that diagnosed patient				
Hospital	1.00	1.00	1.00	
Outpatient	0.75 (0.71-0.79)	0.91 (0.86-0.96)	0.93 (0.84-1.02)	
Private physician	0.90 (0.85-0.95)	1.05 (0.99-1.11)	1.08 (0.95-1.22)	
Screening/diagnosis/referral	0.65 (0.61-0.70)	0.84 (0.78-0.90)	0.86 (0.80-0.92)	
Other or unknown	0.62 (0.53-0.73)	0.78 (0.66-0.92)	0.80 (0.62-1.02)	
Distance between patient and facility				
<1 mile	1.00	1.00	1.00	
1 to <5 miles	1.08 (1.02-1.14)	1.08 (1.03-1.14)	1.09 (1.03-1.15)	
5 to <10 miles	1.01 (0.95-1.08)	1.04 (0.98-1.11)	1.04 (0.96-1.12)	
≥10 miles	0.93 (0.85-1.01)	0.99 (0.90-1.08)	0.99 (0.90-1.10)	
Neighborhood-level variables[5]				
Percent of population below federal poverty threshold in past 12 months				
Low (<10%)	1.00	1.00		1.00
Medium (10 to <20%)	0.98 (0.92-1.04)	0.98 (0.92-1.06)		0.99 (0.92-1.06)
High (20 to <30%)	1.00 (0.94-1.07)	1.03 (0.95-1.11)		1.03 (0.95-1.11)

Very high (≥30%)	0.95 (0.89-1.01)	1.01 (0.94-1.09)	1.01 (0.93-1.10)
Unemployment rate among population 16 years and over	0.95 (0.92-0.99)	1.00 (0.96-1.05)	1.00 (0.95-1.05)
Percent of population that is black or African American only (non-Hispanic)	0.99 (0.98-0.99)	1.00 (0.99-1.01)	1.00 (0.99-1.01)

[1] Hazard ratios and confidence intervals for facility-level variables account for clustering by facility of diagnosis, and those for neighborhood-level variables account for clustering by Census tract. Hazard ratios (HR) are unadjusted unless indicated as "AHR."

[2] Adjusted hazard ratio 1: For each facility- or neighborhood-level variable, adjusting for all individual-level variables

[3] Adjusted hazard ratio 2: For all facility-level variables, adjusting for all individual-level variables

[4] Adjusted hazard ratio 3: For all neighborhood-level variables, adjusting for all individual-level variables

[5] Hazard ratios presented for continuous variables (percent unemployed and percent black) represent the risk per 10-percentage-point increase in the variable.

Figure 2.1. Kaplan-Meier survival curves of time from HIV diagnosis to viral suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012

Figure 2.1a. By eligibility for antiretroviral therapy (ART) at diagnosis (p<0.01)

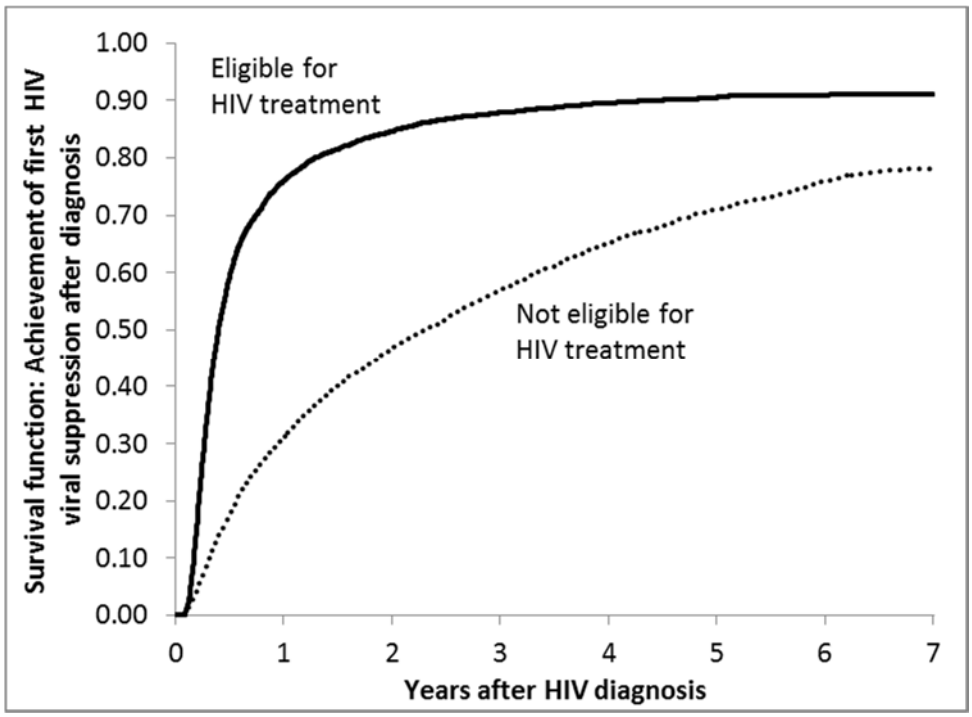


Figure 2.1b. By patient volume (the number of HIV diagnoses made annually by the health care facility that diagnosed the patient) (p<0.01)

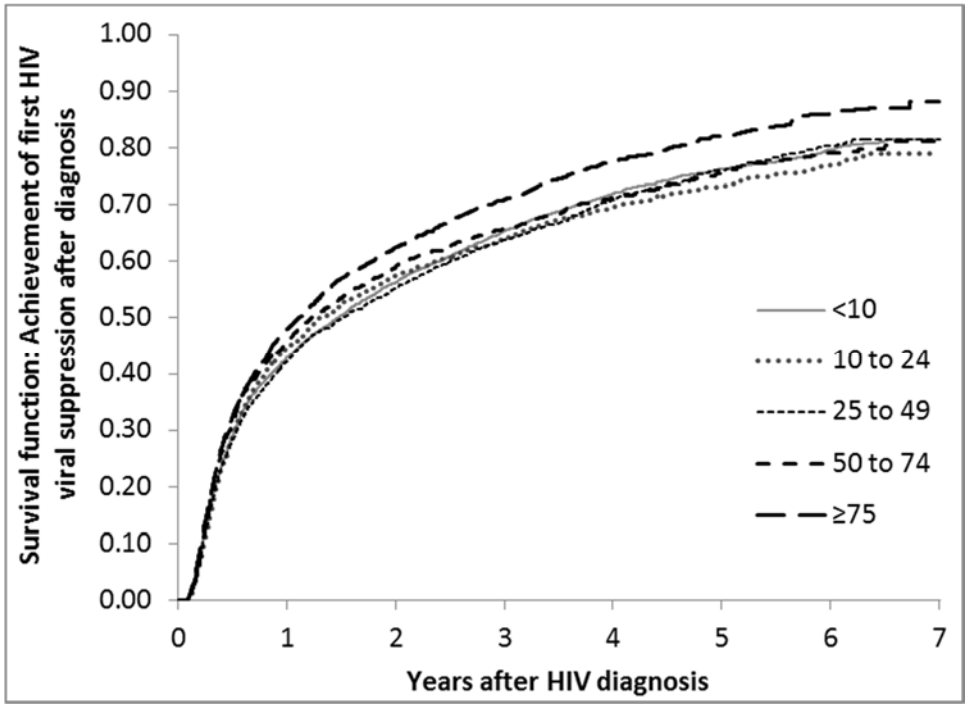
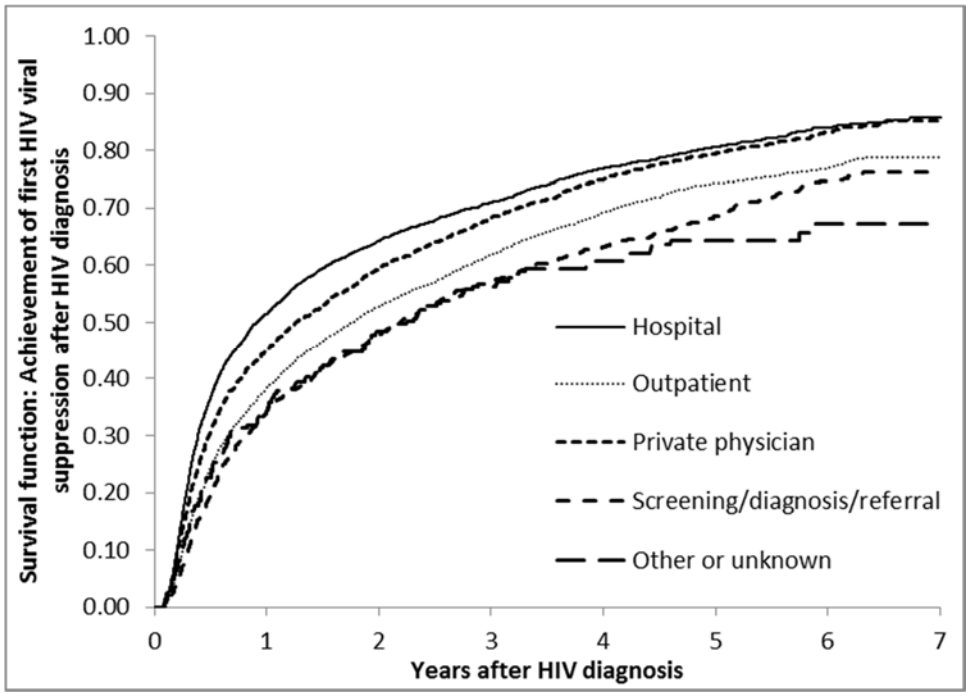


Figure 2.1c. By type of facility that diagnosed the patient (p<0.01)



Chapter 3. Multilevel analysis of individual, health care facility, and neighborhood characteristics associated with HIV virologic failure after suppression among persons newly diagnosed with HIV in New York City

Introduction

New York City (NYC) is home to more than 7% of all persons newly diagnosed with HIV in the United States (US) each year.[1, 2] Reduction of each person's HIV viral load (VL) to low or undetectable levels (e.g., ≤400 copies/mL) is called viral suppression and is typically achieved by antiretroviral therapy (ART) treatment.[4] Viral suppression slows progression of HIV disease [7] and reduces the likelihood of onward sexual transmission.[8] As few as 20% of PLWHA were thought to be suppressed in the US in the early 2000s, while today most estimates exceed 50%;[10-14] in NYC, it was 59% in 2010.[14] The US National HIV/AIDS Strategy's 2015 goal is a 20% increase in the proportion of persons virally suppressed, within several populations most affected by HIV (blacks, Hispanics, and gay and bisexual men).[9]

Epidemiologic studies have rarely examined VL over time or in terms of factors other than individual demographics and clinical characteristics. Most published population-level viral suppression estimates, including those in the HIV care continuum literature, refer only to the most recent VL measure.[10, 13] A single VL measure may not indicate maintenance of suppression (also referred to as sustained suppression).[16] The few population-based studies following individuals' viral loads over time have found that a substantial proportion do not maintain suppression long; for example, 18% of New Yorkers newly diagnosed in 2006-2009 experienced virologic failure (loss after achievement of suppression) within 12 months of suppression.[15, 17-19] While the main driver of virologic failure is poor adherence to ART, a study using NYC data found that more rapid failure after suppression was also associated with individual-level demographic characteristics, e.g., black race, younger age, female sex at birth, baseline clinical status indicators such as CD4 count and VL, and earlier calendar year of diagnosis (i.e., failure rates have declined over time).[15] Further, some of these characteristics are known mediators of adherence. Studies of virologic failure may benefit from the addition of variables describing more macro-level or structural factors, such as the characteristics of the health care facilities where people receive care and the neighborhoods where they live. For example, facility characteristics, such as

type of clinical setting, accessibility (including travel distance for patients), the support offered to patients, and physician experience have been shown to influence intermediary outcomes such as receipt of and adherence to ART, both necessary steps for achievement and maintenance of suppression.[31-34] Moreover, neighborhood factors such as lower area-level socioeconomic status have been associated with delayed initiation of treatment and excess mortality.[31, 33, 39, 43, 93] However, few studies on virologic failure have included facility or neighborhood characteristics.

Information about the characteristics associated with virologic failure is now included in many HIV surveillance registries [15, 25, 52], and these characteristics will become increasingly important to identify as more persons with HIV receive ART and achieve suppression. Thus, to examine these factors, we investigated the effect of individual, health care facility, and neighborhood characteristics on HIV virologic failure among New York City residents aged 13 years and older who were diagnosed with HIV between 2006 and 2010 and had achieved viral suppression. The results of this analysis may be used to improve public health by identifying groups of persons who, because of individual or structural factors, are vulnerable to virologic failure and who might benefit from interventions accounting for these factors to improve ART adherence.

Methods

Data sources

This retrospective analysis used data from the NYC HIV surveillance registry reported by September 30, 2013, the 2010 US Census,[54] and the 2011 American Community Survey.[55] The registry includes all persons diagnosed and reported with HIV in NYC since 2000. It gathers information by medical record review, provider report at diagnosis, and HIV-related laboratory tests, which are electronically reported to surveillance for all existing cases diagnosed and/or receiving care in NYC.

The registry included individual-level demographic and clinical information collected at the time of first report of HIV diagnosis or first VL test indicating suppression, address of residence at diagnosis, and HIV-related laboratory test results from 2006-2012 for all New Yorkers newly diagnosed with HIV and achieving viral suppression. Laboratory reports contain the test type, specimen collection date, result, and submitting provider or facility. Health care facility data from 2006-2012 were obtained from the registry and linked to cases according to the facility that conducted the first VL test indicating suppression

for each case. Finally, neighborhood data were acquired from the 2010 US Census and the 2011 American Community Survey 5-year estimates. Patient address of residence at diagnosis, obtained from the registry, was geocoded to the Census tract to link tract-level neighborhood data from the US Census and American Community Survey to individuals. Although the baseline time point for this analysis was first viral suppression, residence at diagnosis rather than at first suppression was used because Census tract-level residence data at first suppression were not available.

Population

Our analysis population was drawn from NYC residents who were newly diagnosed with HIV between 2006 and 2010, were at least 13 years of age at diagnosis, and achieved viral suppression (≤400 copies/mL) ≥31 days following diagnosis and by 12/31/2012 (N=10,232 persons). The cut-off for suppression was 400 copies/mL because this was the highest lower detectable limit of all VL assays being used during the study period.[59] Persons were then excluded from the analysis population if their death date appeared to precede their first suppression date (n=6), they had an HIV diagnosis date that was potentially misclassified (n=653; e.g., they had neither a Western blot confirmatory test within 31 days of diagnosis nor a diagnosis of acute HIV infection), the name of the facility of diagnosis or suppression was missing (n=15), their address of residence and of facility of diagnosis or suppression were equivalent, possibly indicating a homeless or institutionalized person, for whom characteristics of the neighborhood of residence might influence health outcomes differently (n=415), they were diagnosed or suppressed at a correctional facility or suppressed at a screening/diagnostic facility, possibly indicating an institutionalized person or a misclassified care facility type (n=205), or their neighborhood-level characteristics were unknown (n=11). These exclusions yielded an analytical sample of 8,927 persons (see Appendix 1).

Outcome

The outcome of interest was virologic failure, defined as having a VL ≥1,000 copies/mL or not having any VL test for 12 consecutive months. The 1,000-copy cutoff permitted a modest increase in VL above 400 that would not necessarily signal virologic failure but rather perhaps just a "blip."[60] Additionally, risk of HIV transmission from a person with VL up to 1000 is low.[8, 61] Requiring VL tests every 12 months in order to be classified as maintaining suppression ensured at least minimal engagement in care, as quarterly testing is recommended for most persons with HIV.[70] The 12-month

requirement also provided an endpoint for persons who dropped out of care, since care is required to detect any VL, and it was not reasonable to assume that persons who dropped out of care in NYC would remain suppressed. Censoring occurred at whichever came earlier: death or the end of the follow-up period. Follow-up time was calculated as the number of days from the date of first viral suppression after HIV diagnosis to the earliest of these dates: virologic failure, death, or 12/31/2012.

Covariates

Individual-level variables

Most of the demographic characteristics in our analyses were shown in previous analyses to be associated with virologic failure among newly diagnosed New Yorkers who had achieved viral suppression.[15] Demographic characteristics (age, sex at birth, race/ethnicity, area of birth), HIV transmission risk (also referred to as transmission categories), viral suppression date, viral loads, CD4 counts, and address of residence at diagnosis were acquired from the NYC HIV surveillance registry.

Age at viral suppression was calculated from birth date to date of first suppression and categorized as 13-19, 20-29, 30-39, 40-49, 50-59, and 60+.[2] Sex at birth was specified as collected, male or female. Race was collected as white or Caucasian, black or African American, Asian or Pacific Islander, and Native American. Ethnicity was collected as Hispanic, non-Hispanic, or unknown. Race and ethnicity were combined into a single variable in which all persons of Hispanic ethnicity were classified as Hispanic, and non-Hispanics were classified as black, white, or other non-Hispanic race (which included Asians and Pacific Islanders, Native Americans, and multiracial persons).[15] Area of birth was collected as country of birth when available or region of birth and categorized as born in the US, US dependency (e.g., Puerto Rico), foreign country, or unknown place of birth.[68]

HIV transmission risk category was based on pre-diagnosis risk behaviors documented in the medical record and/or self-reported at the time of diagnosis (e.g., injection drug use, male-male sex) and the sex, HIV status (e.g., HIV-positive), and risk (e.g., injection drug use) of the pre-diagnosis heterosexual-sex partners reported by the case.[69] This information was combined into hierarchical categories: injection drug use, men who have sex with men, heterosexual sex, and other or unknown (which included perinatal transmission).[15] To be classified as most likely having acquired HIV through heterosexual sex, persons must have reported pre-diagnosis sex with a partner of the other sex who was

HIV-infected, had injected drugs, or had received blood products. In addition, females could be classified as heterosexual if they had probable heterosexual transmission noted in their medical record, reported sex with a male and no history of drug injection, or had any one of several behaviors associated with heterosexual transmission (history of prostitution, multiple sex partners, sexually transmitted disease, crack/cocaine use, or sex with a bisexual male).[2]

CD4 count (if any) at suppression was based on the first CD4 count within 31 days before or after suppression and categorized as 0-199, 200-349, 350-499, and ≥500 cells/mL.

Health care facility-level variables

Characteristics of the facility of first suppression include annual HIV patient volume, type, and patient-to-provider distance, all of which could be ascertained or calculated based on information in the NYC HIV surveillance registry. HIV patient volume was collected as number of HIV-positive patients cared for annually, based on persons receiving a VL or CD4 test (as reported to surveillance) at that facility in the year of the patient's viral suppression, and categorized as <250, 250-999, 1,000-1,999, and ≥2,000 patients per year.[33, 73] Facility type was categorized as hospital, private physician (also referred to as private practice), other outpatient facility, and other or unknown (<10 persons had a known facility but unknown type), as potential indicators of the availability of ancillary services (at the first and third types) [32]. These two variables of HIV patient volume and facility type were further combined (see Appendix 7), with patient volume dichotomized as <1,000 (small) and ≥1,000 (large), to better capture underlying concepts. Patient-provider distance was calculated as the distance in miles using the most direct street route from patient residence to the facility where suppression was first detected (based on the XY coordinates of each) using Network Analyst in ArcMap 10.0 (ESRI, Redmonds, CA) and a network dataset of NYC streets that is used within the NYC Department of Health and Mental Hygiene (see Appendix 4). This distance was categorized as <1 mile, 1-<5 miles, 5-<10 miles, and ≥10 miles.

Neighborhood-level variables

Analyses included two Census tract-level SES measures from 2011 American Community Survey (ACS) 5-year estimates; this is the recommended source for such statistics because the 2010 decennial census did not collect them.[74] These measures have previously been associated with HIV or sexually transmitted infections or HIV outcomes and include percent of residents with incomes under the federal

poverty threshold[31, 33, 39, 40, 47, 75] and percent unemployed among residents aged 16 years and older.[31, 39, 41, 75] Census 2010 provided data on percent of non-Hispanic black residents.[74] The values for percent unemployed and percent black were divided by 10 and entered into a proportional hazards regression as continuous variables with every unit representing a 10-percentage-point difference. Poverty was categorized as 0 to <10% (low-poverty), 10 to <20% (medium-poverty), 20 to <30% (high-poverty), and 30 to 100% (very-high-poverty), based on recommendations of the NYC health department.[76] These particular neighborhood-level variables (poverty, unemployment, and black race) have been used together previously.[43]

Statistical analysis

Descriptive statistics were calculated for selected characteristics at the individual, facility, and neighborhood levels and presented for the overall population and according to virologic failure status within 12 months (365 days) of suppression. Association between each variable and virologic failure within 12 months was measured using Chi-squared tests. Differences in median days to failure by the end of the follow-up period were determined using Mann-Whitney U test.

Kaplan-Meier curves showing the number of days from suppression to failure were generated by key individual, health care facility, and neighborhood characteristics. Log-rank tests were used to indicate differences between groups.

Cox proportional hazards regressions estimated the association of individual, facility, and neighborhood-level factors with failure in crude and adjusted models. Robust sandwich estimation of the standard errors was used to account for correlations of individual outcomes within either facility of suppression or neighborhood (Census tract).[62, 63] We fit several models after estimating unadjusted rates for virologic failure for each individual, facility, and neighborhood characteristic. We began by estimated hazards of virologic failure for each individual characteristic after adjustment for all other individual characteristics (i.e., without any facility or neighborhood characteristics). Next, we fit models to estimate the hazards for each facility and each neighborhood characteristic, after controlling for individual characteristics. Specifically, because we were exploring the role of structural or macro-level variables in virologic failure, each variable at the facility or neighborhood level was entered, one at a time, into a model with all individual characteristics. Finally, two models were fitted to estimate the adjusted hazards for 1) all individual and facility characteristics and 2) all individual and neighborhood characteristics.

Model fit was compared with a X^2 test according to difference in -2LL and degrees of freedom (see Appendix 7).

All analyses were conducted using SAS 9.2 (SAS Institute, Cary, NC). Ethical approval for the analysis was granted by the Institutional Review Boards of Lehman College of the City University of New York and of the New York City Department of Health and Mental Hygiene.

Results

Descriptive statistics

Of 8,927 New Yorkers newly diagnosed with HIV in 2006–2010 and achieving viral suppression, approximately three-quarters were 20-49 years old (78.9%), male (74.2%), and black or Hispanic (79.9%; Table 3.1). Approximately half were US-born (52.7%), were men who have sex with men (46.8%), and had CD4 counts ≥350 at suppression (49.6%). Almost one-fifth (18.2%) of the population experienced failure within 12 months of suppression (Table 3.1). Compared to persons who did not experience failure within 12 months of suppression, those who did were more likely to be younger, female, black or Hispanic, born in a US dependency, and injection drug user or heterosexual (all *p*-values <0.001).

Virologic failure occurred at a median of 728 days, i.e., approximately 2 years after achievement of suppression (Table 3.1). Failure happened most quickly among persons who were younger vs. older, black or Hispanic vs. white, born in the US or a US dependency vs. foreign-born, or injection drug user vs. other risk categories. Failure was also quicker among persons who had suppressed in later vs. earlier calendar years (but likely, in part, as an artifact of the shorter follow-up time for those suppressing in later years), had higher vs. lower CD4 counts at suppression, or first achieved suppression in large outpatient facilities or large private practices vs. smaller or other facility types. Differences in time to failure were most prominent by CD4 count (827 days among persons with CD4 0-199 vs. 599 among 500+). These differences were confirmed by the Kaplan-Meier survival curves (by CD4 count, *p*=0.0074; Figure 3.1a).

Approximately half of the population first achieved suppression in facilities that cared for ≥1,000 HIV-positive persons (52.7%), were hospitals (54.7%), and were 1 to <5 miles from their home (52.5%; Table 3.2); and lived in neighborhoods where ≥20% of the population was below the poverty threshold (i.e., high or very high poverty; 58.0%). Among persons in the analysis population, the mean

neighborhood-level unemployment rate was 10.7% (for reference, in comparison, the citywide rate was 9.5%[55]), and the mean neighborhood-level percent black was 33.3% (the citywide rate was 22.8%[94]).

When compared to persons who maintained suppression, those who experienced failure within 12 months of first suppression were most likely to have been first suppressed at large hospitals or small outpatient facilities and to be residents of higher-poverty neighborhoods (Table 3.2). Differences in failure by facility type and patient volume as well as by neighborhood poverty level were clearly apparent in Kaplan-Meier survival curves (all $p<0.0001$; facility type and patient volume and neighborhood poverty shown in Figures 3.1b-3.1c).

Modelling individual characteristics

Table 3.3 presents the unadjusted and adjusted HRs for individual characteristics on HIV virologic failure among persons newly diagnosed with HIV and achieving viral suppression in NYC. The unadjusted HRs show that persons who were younger, female, black or Hispanic, born in the US or a US dependency, not men who have sex with men, and who had a CD4 count ≥500 cells/mL experienced rates of failure that were elevated at least 10% (range 11% to 95%).

After adjustment for individual characteristics only, the rate of virologic failure remained higher among younger persons, blacks and Hispanics, US- and US-dependency born persons, heterosexuals and injection drug users, and persons with CD4 counts ≥500 cells/mL at suppression, compared with others. For example, rates were between 21 and 101% higher for persons 13-49 years old relative to those 60 and older (e.g., 20-29 years old, 56%[95%CI=1.32-1.85]). These findings remained nearly identical when adjusting for either facility or neighborhood characteristics (adjusted hazard ratios [AHRs] 2 and 3 in Table 3.3).

Modelling facility and neighborhood characteristics

Table 3.4 presents the unadjusted and adjusted HRs for facility and neighborhood characteristics on HIV virologic failure among persons newly diagnosed and achieving suppression with HIV in NYC. The unadjusted HRs show higher failure rates among persons suppressed at hospitals and small outpatient facilities, and among residents of neighborhoods with higher proportions of residents who were poor, unemployed, or black, compared with others.

Most facility-related findings remained the same after adjustment for individual characteristics alone, and then individual characteristics as well as either all facility or all neighborhood characteristics.

However, persons suppressed at small private practices or at small facilities other than hospitals, outpatient facilities, or private practices, became as likely as persons in large hospitals to experience failure (when controlling for all individual and facility characteristics, AHR[95%CI]=0.94[0.81-1.08]). The model with all individual- and facility-level variables had the best fit (-2LL: 64,069; p<0.0001 vs. the model with all individual-level variables only; see Appendix 7). Among neighborhood characteristics, only high or very high poverty remained associated with failure in models adjusted for individual characteristics (e.g., AHR=1.19[95% CI=1.06-1.34] for very-high vs. low poverty).

Discussion

Virologic failure after suppression was experienced more quickly among persons who were younger, black or Hispanic, US- or US-dependency-born, non-MSM, and diagnosed in earlier years, and among persons with higher CD4 counts at suppression, after controlling for facility or neighborhood characteristics. Similarly, persons receiving care at facilities that were not large outpatient facilities or large private practices, and residents of higher-poverty neighborhoods, had higher failure rates than others, after controlling for individual and other facility or neighborhood characteristics.

Our findings about individual, facility, and neighborhood characteristics associated with failure were largely consistent with the literature [15, 31-34, 39] and also provided unique information about teenagers. Several studies have examined the influence of age on suppression and failure among persons 18 or 21 years of age and older.[15, 95, 96] However, few studies of virologic failure have included younger teens. In our analysis, persons in the 13-19-year age group (28% of whom were under 18; see Appendix 7) had the highest rate of failure. Teenagers have been found to have lower rates of retention in care and ART adherence.[77, 78] Higher failure rates among persons in care at facilities other than large outpatient facilities or large private practices possibly may be because those facilities were less likely to provide services supporting retention, adherence, and case management (in some cases, due to their smaller size), which have been shown to facilitate retention in care;[79, 80] their providers were less likely to adhere to HIV-related care recommendations;[81] or the patients had clinical, behavioral, or socioeconomic characteristics not captured in our models, such as addiction, other mental illness, or individual poverty, that left them less able to maintain high adherence even if they were able to see a physician, obtain ART, and achieve suppression. The potential explanations of individual poverty

or of mental illness (if so disabling as to qualify someone for public health insurance) would be consistent with previous findings that persons with private insurance were more likely to sustain viral suppression than persons insured by Medicaid or Medicare, or who were uninsured.[20] Our analysis was unable to identify which of these factors might account for the higher failure rates among persons achieving suppression even at large hospitals, many of which are Designated AIDS Centers. Our findings about neighborhood-level poverty being associated with failure were consistent with previous studies on neighborhood-level socioeconomic factors and care-related outcomes[31, 33, 38-42]. However, percentages of neighborhood residents who were black or unemployed were not associated with failure after controlling for neighborhood-level poverty. This is consistent with previous findings that neighborhood-level poverty, rather than other factors such as neighborhood-level racial/ethnic makeup or unemployment rates, was the socioeconomic indicator most predictive of health disparities.[47] This also suggests that the many resources available for low-income PLWHA in NYC to receive care, medication, and other forms of support, may not entirely eliminate the effects of poverty on HIV-related health outcomes.

Prior literature found that shorter distance to the nearest HIV care site was associated with achievement of viral suppression among persons retained in care.[84] However, we found no association between distance from a person's residence to the facility at which s/he was first suppressed (i.e., where s/he was receiving care) and time from first viral suppression to failure. The extensiveness of NYC's systems of HIV care and public transit,[97] coupled with New York State's generous benefits and services for persons with HIV,[98] may have helped render patient-provider distance irrelevant to virologic failure – even as a relationship between neighborhood-level poverty and failure persisted.

In summary, adding facility and neighborhood variables to population-level models of virologic failure after suppression did not change the individual characteristics associated with failure but did permit the identification of several structural (i.e., facility and neighborhood) factors also associated with failure. These structural factors may be useful targets for interventions aiming to increase maintenance of suppression among persons with HIV, or may be used to indicate persons who would benefit from additional support to maintain suppression, thereby improving their health and reducing transmissibility.

Limitations

Our analysis was subject to limitations typical of population-based, multilevel, geographic, or surveillance-based analyses. Namely, some people's VL was measured only at irregular intervals, and outmigration could not be directly ascertained. Data on several factors that may influence maintenance of suppression were not available in the HIV surveillance registry. Additionally, it was difficult to identify the level at which certain characteristics influenced the outcome. Finally, findings may have been sensitive to the geographic level of aggregation, i.e., Census tract, or to residential moves between diagnosis and suppression. These factors may have caused over- or underestimation of hazard ratios.

Our analysis had VL data only when persons sought care, which was at their discretion and not necessarily at regular intervals. Persons may have experienced virologic failure sometime before it was measured in a VL test or after dropping out of care. Persons not in care in NYC for up to 12 months after a suppressed VL were presumed to be present and suppressed, although prior to the 12-month mark they may have experienced failure or moved out of NYC and maintained suppression elsewhere. It is not clear whether irregular testing and unascertained outmigration would have increased or decreased our hazard ratios. However, the majority of New Yorkers newly diagnosed with HIV between 2006 and 2010 were engaged in care at intervals that were both consistent with federal guidelines and sufficiently frequent to produce population-level estimates of suppression. Specifically, among newly diagnosed persons with at least one VL test between diagnosis and death, persons diagnosed in 2006, with the most follow-up, had a median of 17 VL tests (IQR: 10-23) and the median interval between tests was 120 days (4 months; IQR: 95-182 days), while persons diagnosed in 2010 had a median of 8 tests (IQR: 5-10) and the median interval between tests was 101 days (3 months; IQR: 85-139 days). Additionally, there is likely to be little under-ascertainment of failure among persons in NYC, for several reasons. First, a recently diagnosed and virally suppressed person with no subsequent blood draw for VL tests cannot receive ART by prescription and therefore is unlikely to maintain suppression.[72] Second, a newly suppressed person was in NYC as recently as his/her suppression date, and thus, had relatively little time to leave NYC. Third, the system of care and services, generous benefits, and large HIV-positive population in NYC have long made it a relatively attractive place for HIV-positive persons to live and receive care; this likely promotes retention and suppression.

Because the HIV surveillance system provided the individual-level data in our analysis, information about several individual factors that may influence the maintenance of suppression were not available. Specifically, mental illness and addiction that are not well-controlled may affect a person's ability to adhere to ART, potentially triggering failure after suppression, but mental health and substance use (other than injection drug use) are not necessarily well-documented in the medical record at the facility diagnosing HIV nor well-ascertained by surveillance. Further, information about ART adherence, the primary driver of maintenance of suppression, was not available.

Characteristics measured at one level in our models may have acted at another level. For example, poverty was measured at the neighborhood level only and was found to be significantly associated with virologic failure. It is possible that this association was present only because there is an association between neighborhood- and individual-level poverty, which was not measured, and failure (and individual- and neighborhood-level poverty are correlated), or alternatively, that individual-level poverty would not in fact have been associated with failure. This limitation is not unique to our analysis but rather is characteristic of multilevel analyses.[89, 90]

As in any geographic analysis, our findings may have been subject to the modifiable areal unit problem, meaning they were sensitive to the geographic level (Census tract) at which patient residence and facility location were measured.[99-101] Analyses at other levels would have grouped people differently, e.g., in smaller or larger areas, or with different geographic boundaries that would have resulted in different aggregations of people, and may have produced different findings. Further, because of the edge effect, adjacent or nearby Census tracts may have had cross-boundary similarities and influences, largely due to the movement of people across multiple Census tracts.[102, 103] This could dilute the effect of differences across neighborhoods.

Because Census tract-level residence information at first viral suppression was not available, we assumed that the neighborhood characteristics of a person's residence at diagnosis were comparable to those at first suppression. However, more than 21% of persons in our analysis may have changed Census tract of residence between diagnosis and suppression. Studies have shown that persons who move typically go to similar neighborhoods.[104] However, in the population in our analyses, many of the 21% who moved went to Census tracts with different characteristics, e.g., poverty level, than the Census

tracts they were living in at diagnosis. It is not possible to determine whether this misclassification of persons' neighborhood-level variables was differential or non-differential (see Appendix 7).

Strengths

This is among the first analyses in the US to investigate the influence of facility and neighborhood on HIV outcomes using surveillance data. [31, 33, 35, 87] The data were drawn from population surveillance in the largest HIV epidemic in the US, in a diverse US city. The analysis combined data from multiple sources to assess the potential influence on virologic failure of factors beyond the individual. Mandatory electronic reporting of laboratory tests in NYC provided information about all measured VLs for all HIV-positive persons receiving care in NYC, as opposed to in a clinical trials environment, where findings can differ from those in a population setting. To assign area-based characteristics to individuals, we used patient address geocoded to the Census tract, which is the gold standard for detection of public health disparities;[47] other geographic analyses of HIV care outcomes have used only counties and ZIP codes, which are much larger than Census tracts. Due to NYC's heterogeneity, the smaller geographic unit (tract) was preferable. We filled a gap in the literature by including teenagers, who are subject to the same treatment guidelines as adults but whose age may have contributed to quicker virologic failure than among older persons.[78] The survival analysis method permitted the analysis of VL data over a long period of time and did not require multiple VL tests as an inclusion criterion.

Conclusions

Our findings suggest that persons with HIV who are younger, black or Hispanic, US- or US-dependency-born, non-MSM, or have higher CD4 counts at suppression; or who seek care at facilities other than large outpatient facilities or large private practices; or who live in high- or very-high-poverty neighborhoods; were more likely to experience virologic failure. These populations may need more assistance after viral suppression in the areas of retention in care or ART adherence. These facility- and neighborhood-level effects were found even in NYC, the setting for this analysis, i.e., a large, densely populated city with extensive systems of high-quality HIV care, social services, and public transportation. It is possible that the effects would have been even larger in a setting other than NYC that may not have been as well-resourced vis-à-vis medical facilities and transportation systems. It is possible that residents of poorer neighborhoods in NYC might benefit from even better care that permitted them to maintain suppression at comparable rates as residents of wealthier neighborhoods; rectifying this disparity may

require targeted adherence support services or additional general poverty alleviation. Further investigation is needed to understand why lower rates of failure were seen among patients at large outpatient facilities and large private providers, which serve a minority of New Yorkers with HIV. Additional investigation would also be valuable to suggest how large hospitals – many of which are Designated AIDS Centers, and which detected the first viral suppression for 43% of newly diagnosed New Yorkers – can better support their patients in maintaining suppression.

Table 3.1. HIV virologic failure[1] within 12 months after first viral suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012, by individual-level characteristics

	Total	No virologic failure* within 12 months of suppression	Virologic failure[1] within 12 months of suppression			Median time from suppression to failure	
	Distribution (n)	Distribution (n)	Distribution (n)	Prevalence	*p*-value[2]	Median (IQR[3]) days	*p*-value[4]
Total	***100.0 (8,927)***	***100.0 (7,300)***	***100.0 (1,627)***	***18.2***		***728 (864)***	
Age group (years)					<0.0001		<0.0001
13 - 19	2.2 (196)	1.8 (134)	3.8 (62)	31.6		571 (746)	
20 - 29	26.4 (2,360)	25.8 (1,887)	29.1 (473)	20.0		653 (748)	
30 - 39	27.0 (2,409)	27.5 (2,009)	24.6 (400)	16.6		770 (887)	
40 - 49	25.5 (2,274)	25.6 (1,866)	25.1 (408)	17.9		741 (904)	
50 - 59	13.8 (1,235)	14.2 (1,036)	12.2 (199)	16.1		801 (940)	
≥60	5.1 (453)	5.0 (368)	5.2 (85)	18.8		796 (989)	
Sex at birth					<0.0001		0.0564
Male	74.2 (6,623)	75.6 (5,518)	67.9 (1,105)	16.7		742 (841)	
Female	25.8 (2,304)	24.4 (1,782)	32.1 (522)	22.7		708 (930)	
Race/Ethnicity					<0.0001		<0.0001
Black	46.7 (4,167)	45.6 (3,330)	51.4 (837)	20.1		685 (865)	
Hispanic	33.2 (2,964)	32.4 (2,362)	37.0 (602)	20.3		732 (918)	
White	16.7 (1,489)	18.4 (1,341)	9.1 (148)	9.9		807 (749)	
Other	3.4 (307)	3.7 (267)	2.5 (40)	13.0		908 (870)	
Country of birth					0.0004		<0.0001
US	52.7 (4,703)	52.5 (3,829)	53.7 (874)	18.6		689 (823)	
US Dependency	4.5 (404)	4.1 (302)	6.3 (102)	25.2		685 (959)	
Foreign	32.6 (2,906)	32.9 (2,402)	31.0 (504)	17.3		791 (913)	
Unknown	10.2 (914)	10.5 (767)	9.0 (147)	16.1		818 (981)	
HIV transmission risk					<0.0001		<0.0001

Men who have sex with men	46.8 (4,181)	48.8 (3,561)	38.1 (620)	14.8		753 (808)	
Injection drug use history	4.7 (423)	4.2 (307)	7.1 (116)	27.4		550 (975)	
Heterosexual	26.1 (2,328)	24.9 (1,815)	31.5 (513)	22.0		711 (900)	
Other or unknown	22.3 (1,995)	22.2 (1,617)	23.2 (378)	18.9		748 (946)	
Year of suppression					<0.0001		<0.0001
2006	6.1 (549)	6.0 (441)	6.6 (108)	19.7		1,077 (1,869)	
2007	12.7 (1,131)	12.2 (894)	14.6 (237)	21.0		1,255 (1,577)	
2008	16.6 (1,478)	16.4 (1,195)	17.4 (283)	19.1		1,241 (1,225)	
2009	20.2 (1,803)	20.1 (1,468)	20.6 (335)	18.6		1,138 (836)	
2010	22.7 (2,030)	23.3 (1,699)	20.3 (331)	16.3		809 (451)	
2011	14.5 (1,291)	14.1 (1,029)	16.1 (262)	20.3		516 (264)	
2012	7.2 (645)	7.9 (574)	4.4 (71)	11.0		194 (188)	
CD4 count at suppression					0.4633		<0.0001
0-199	19.3 (1,722)	19.0 (1,390)	20.4 (332)	19.3		827 (1,089)	
200-349	22.5 (2,006)	22.5 (1,641)	22.4 (365)	18.2		816 (941)	
350-499	22.5 (2,012)	22.8 (1,664)	21.4 (348)	17.3		768 (836)	
500+	27.1 (2,415)	26.9 (1,964)	27.7 (451)	18.7		599 (674)	
No CD4 count	8.6 (772)	8.8 (641)	8.1 (131)	17.0		718 (922)	

[1] Virologic failure was defined as first viral load of ≥1,000/mL or 12 months without a viral load test.

[2] *p*-value: Chi-square test of association between each variable and virologic failure

[3] IQR: Interquartile range, i.e., 3rd quartile minus 1st quartile

[4] *p*-value: Mann-Whitney U test of differences by each variable in median days to failure

Table 3.2. HIV virologic failure[1] after suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012, by characteristics of the health care facility at which persons were diagnosed and the neighborhood (Census tract) persons were living in at diagnosis

	Total	No virologic failure* within 12 months of suppression	Virologic failure[1] within 12 months of suppression			Median time from suppression to failure	
	Distribution (n) or Mean (SD)	Distribution (n)	Distribution (n)	Prevalence	*p*-value[2]	Median (IQR[3]) days	*p*-value[4]
Total	***100.0 (8,927)***	***100.0 (7,300)***	***100.0 (1,627)***	***18.2***		***728 (864)***	
Facility-level variables							
Number of HIV-positive patients cared for annually by health care facility where patient suppressed (patient volume)					0.1007		0.2227
<250	21.9 (1,951)	21.9 (1,596)	21.8 (355)	18.2		711 (831)	
250 to 999	25.4 (2,267)	25.7 (1,874)	24.2 (393)	17.3		731 (833)	
1,000 to 1,999	26.2 (2,342)	25.7 (1,877)	28.6 (465)	19.9		742 (931)	
≥2,000	26.5 (2,367)	26.8 (1,953)	25.4 (414)	17.5		748 (857)	
Type of facility where patient suppressed					<0.0001		<0.0001
Hospital	54.7 (4,879)	53.5 (3,904)	59.9 (975)	20.0		741 (925)	
Outpatient	25.7 (2,298)	25.5 (1,864)	26.7 (434)	18.9		678 (789)	
Private physician	17.5 (1,564)	19.0 (1,386)	10.9 (178)	11.4		815 (817)	
Other or unknown	2.1 (186)	2.0 (146)	2.5 (40)	21.5		578 (746)	
Facility type by patient					<0.0001		<0.0001

volume							
Hospital, ≥1,000	43.3 (3,865)	42.1 (3,074)	48.6 (791)	20.5		732 (936)	
Hospital, <1,000	11.4 (1,014)	11.4 (830)	11.3 (184)	18.1		761 (887)	
Outpatient, ≥1,000	8.3 (738)	9.0 (655)	5.1 (83)	11.2		739 (691)	
Outpatient, <1,000	17.5 (1,560)	16.6 (1,209)	21.6 (351)	22.5		645 (824)	
Private physician, ≥1,000	1.2 (106)	1.4 (101)	0.3 (5)	4.7		977 (714)	
Private physician, <1,000	16.3 (1,458)	17.6 (1,285)	10.6 (173)	11.9		794 (814)	
Other or unknown, <1,000	2.1 (186)	2.0 (146)	2.5 (40)	21.5		578 (746)	
Distance between patient and facility					0.0925		0.1522
<1 mile	15.8 (1,409)	15.5 (1,134)	16.9 (275)	19.5		724 (881)	
1 to <5 miles	52.5 (4,684)	52.5 (3,830)	52.5 (854)	18.2		740 (869)	
5 to <10 miles	22.7 (2,024)	23.1 (1,687)	20.7 (337)	16.7		741 (839)	
≥10 miles	9.1 (810)	8.9 (649)	9.9 (161)	19.9		684 (857)	
Neighborhood-level variables							
Percent of population below federal poverty threshold in past 12 months					<0.0001		<0.0001
Low (<10%)	15.9 (1,420)	17.0 (1,238)	11.2 (182)	12.8		832 (850)	
Medium (10 to <20%)	26.1 (2,328)	26.8 (1,956)	22.9 (372)	16.0		750 (827)	
High (20 to <30%)	25.5 (2,278)	25.4 (1,854)	26.1 (424)	18.6		726 (850)	
Very high (≥30%)	32.5 (2,901)	30.8 (2,252)	39.9 (649)	22.4		658 (913)	
Percent of population 16 years and over that was unemployed in past week	10.7 (5.6)	-	-	-	N/A	-	N/A
Percent of population that is black or African American only (non-	33.3 (29.0)	-	-	-	N/A	-	N/A

Hispanic)
[1] Virologic failure was defined as first viral load of ≥1,000/mL or 12 months without a viral load test. [2] *p*-value: Chi-square test of association between each variable and virologic failure [3] IQR: Interquartile range, i.e., 3rd quartile minus 1st quartile [4] *p*-value: Mann-Whitney U test of differences by each variable in median days to failure

Table 3.3. Proportional hazards regressions of HIV virologic failure[1] after suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012 (N=8,927), by individual-level characteristics

	HR (95% CI)[1]	AHR 1 (95% CI)[1,2]	AHR 2 (95% CI)[1,3]	AHR 3 (95% CI)[1,4]
Age group (years)				
13 - 19	1.95 (1.52-2.49)	2.01 (1.57-2.57)	2.00 (1.53-2.62)	1.97 (1.53-2.52)
20 - 29	1.35 (1.14-1.59)	1.56 (1.32-1.85)	1.61 (1.33-1.93)	1.54 (1.31-1.82)
30 - 39	1.10 (0.93-1.29)	1.27 (1.08-1.50)	1.32 (1.10-1.58)	1.26 (1.07-1.49)
40 - 49	1.11 (0.93-1.31)	1.21 (1.02-1.43)	1.24 (1.04-1.47)	1.20 (1.02-1.42)
50 - 59	0.97 (0.81-1.16)	0.98 (0.82-1.17)	0.99 (0.83-1.17)	0.97 (0.81-1.17)
≥60	1.00	1.00	1.00	1.00
Sex at birth				
Male	0.82 (0.76-0.89)	1.06 (0.95-1.19)	1.07 (0.98-1.17)	1.08 (0.96-1.20)
Female	1.00	1.00	1.00	1.00
Race/Ethnicity				
Black	1.54 (1.41-1.69)	1.39 (1.26-1.53)	1.31 (1.16-1.47)	1.27 (1.14-1.43)
Hispanic	1.35 (1.22-1.49)	1.24 (1.11-1.39)	1.17 (1.02-1.35)	1.17 (1.04-1.31)
White	1.00	1.00	1.00	1.00
Other	0.89 (0.72-1.10)	0.92 (0.74-1.15)	0.87 (0.65-1.18)	0.90 (0.72-1.12)
Country of birth				
US	1.19 (1.10-1.28)	1.18 (1.09-1.28)	1.19 (1.10-1.28)	1.17 (1.08-1.27)
US Dependency	1.38 (1.19-1.60)	1.40 (1.20-1.65)	1.39 (1.19-1.64)	1.36 (1.16-1.60)
Foreign	1.00	1.00	1.00	1.00
Unknown	0.95 (0.84-1.06)	1.01 (0.90-1.15)	1.01 (0.88-1.16)	1.02 (0.90-1.15)
HIV transmission risk				
Men who have sex with men	0.75 (0.69-0.81)	0.72 (0.64-0.81)	0.75 (0.67-0.84)	0.73 (0.65-0.83)
Injection drug use history	1.22 (1.05-1.42)	1.23 (1.05-1.46)	1.23 (1.06-1.41)	1.23 (1.04-1.45)
Heterosexual	1.00	1.00	1.00	1.00

Other or unknown	0.87 (0.79-0.95)	0.89 (0.80-0.99)	0.90 (0.81-1.00)	0.89 (0.80-0.99)
Year of suppression				
2006	1.17 (0.90-1.51)	1.21 (0.93-1.57)	1.21 (0.94-1.56)	1.22 (0.94-1.58)
2007	1.16 (0.91-1.49)	1.21 (0.94-1.55)	1.20 (0.93-1.54)	1.21 (0.94-1.56)
2008	1.10 (0.86-1.40)	1.15 (0.90-1.46)	1.14 (0.89-1.46)	1.16 (0.91-1.47)
2009	0.98 (0.77-1.25)	1.01 (0.79-1.29)	1.00 (0.80-1.26)	1.02 (0.80-1.30)
2010	0.94 (0.74-1.20)	0.98 (0.77-1.25)	0.98 (0.77-1.26)	0.99 (0.78-1.27)
2011	1.00 (0.78-1.29)	1.05 (0.81-1.34)	1.05 (0.83-1.34)	1.05 (0.82-1.35)
2012	1.00	1.00	1.00	1.00
CD4 count at suppression				
0-199	1.00	1.00	1.00	1.00
200-349	0.97 (0.88-1.07)	0.99 (0.89-1.09)	1.00 (0.89-1.11)	0.99 (0.89-1.09)
350-499	0.94 (0.85-1.04)	0.97 (0.88-1.08)	0.99 (0.86-1.14)	0.98 (0.88-1.08)
500+	1.11 (1.01-1.22)	1.15 (1.04-1.27)	1.17 (1.05-1.30)	1.15 (1.04-1.27)
No CD4 count	0.99 (0.87-1.13)	0.98 (0.86-1.12)	0.98 (0.88-1.10)	0.98 (0.86-1.12)

[1] Virologic failure was defined as first viral load of ≥1,000/mL or 12 months without a viral load test. Hazard ratios and confidence intervals for models with only individual- or neighborhood-level variables account for clustering by Census tract, and those with facility-level variables account for clustering by facility where suppression was achieved. Hazard ratios (HR) are unadjusted unless indicated as "AHR."

[2] Adjusted hazard ratio 1: For each individual-level variable, adjusting for all other individual-level variables

[3] Adjusted hazard ratio 2: For all individual-level variables, adjusting for all facility-level variables

[4] Adjusted hazard ratio 3: For all individual-level variables, adjusting for all neighborhood-level variables

Table 3.4. Proportional hazards regressions of HIV virologic failure[1] after suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012 (N=8,927), by characteristics of the health care facility at which persons were diagnosed and the neighborhood (Census tract) persons were living in at diagnosis

	HR (95% CI)[1]	AHR 1 (95% CI)[1,2]	AHR 2 (95% CI)[1,3]	AHR 3 (95% CI)[1,4]
Facility-level variables				
Facility type by patient volume				
Hospital, ≥1,000	1.00	1.00	1.00	
Hospital, <1,000	0.97 (0.87-1.08)	0.98 (0.87-1.11)	0.98 (0.87-1.11)	
Outpatient, ≥1,000	0.56 (0.48-0.65)	0.62 (0.52-0.74)	0.63 (0.53-0.75)	
Outpatient, <1,000	1.17 (1.07-1.28)	1.17 (1.03-1.34)	1.17 (1.03-1.33)	
Private physician, ≥1,000	0.66 (0.50-0.88)	0.84 (0.75-0.94)	0.84 (0.75-0.94)	
Private physician, <1,000	0.81 (0.73-0.89)	0.94 (0.81-1.08)	0.94 (0.81-1.08)	
Other or unknown, <1,000	1.16 (0.92-1.45)	1.26 (1.00-1.59)	1.28 (1.01-1.62)	
Distance between patient and facility				
<1 mile	1.00	1.00	1.00	
1 to <5 miles	0.99 (0.92-1.07)	0.96 (0.89-1.05)	0.98 (0.90-1.07)	
5 to <10 miles	0.91 (0.80-1.02)	0.90 (0.80-1.01)	0.94 (0.85-1.04)	
≥10 miles	1.01 (0.86-1.18)	0.94 (0.80-1.10)	0.96 (0.83-1.11)	
Neighborhood-level variables				
Percent of population below federal poverty threshold in past 12 months				
Low (<10%)	1.00	1.00		1.00
Medium (10 to <20%)	1.17 (1.05-1.30)	1.12 (1.00-1.24)		1.11 (0.99-1.23)
High (20 to <30%)	1.35 (1.21-1.50)	1.19 (1.07-1.33)		1.17 (1.04-1.31)
Very high (≥30%)	1.49 (1.34-1.64)	1.23 (1.11-1.37)		1.19 (1.06-1.34)
Percent of population 16 years and over that was unemployed in past week[5]	1.22 (1.15-1.30)	1.09 (1.02-1.17)		1.04 (0.96-1.12)

Percent of population that is black or African American only (non-Hispanic)[5]	1.04 (1.03-1.05)	1.01 (1.00-1.02)	1.01 (1.00-1.02)

[1] Virologic failure was defined as first viral load of ≥1,000/mL or 12 months without a viral load test. Hazard ratios and confidence intervals for facility-level variables account for clustering by facility where suppression was achieved, and those for neighborhood-level variables account for clustering by Census tract. Hazard ratios (HR) are unadjusted unless indicated as "AHR."

[2] Adjusted hazard ratio 1: For each facility- or neighborhood-level variable, adjusting for all individual-level variables

[3] Adjusted hazard ratio 2: For all facility-level variables, adjusting for all individual-level and all other facility-level variables

[4] Adjusted hazard ratio 3: For all neighborhood-level variables, adjusting for all individual-level and all other neighborhood-level variables

[5] Hazard ratios presented for continuous variables (percent unemployed and percent black) represent the risk per 10-percentage-point increase in the variable.

Figure 3.1. Kaplan-Meier survival curves of maintenance of HIV viral suppression after first viral suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012

Figure 3.1a. By CD4 count (cells/mL) at suppression (*p*<0.01)

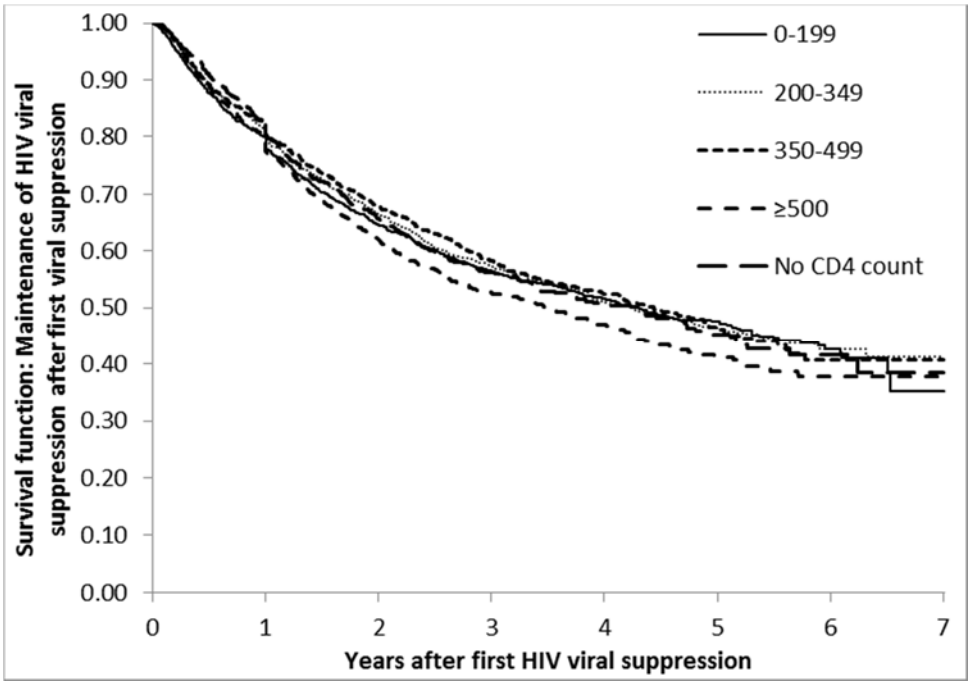


Figure 3.1b. By facility type and annual patient volume (number of HIV-positive persons seen by facility where first HIV viral suppression occurred, in year of person's first suppression) (p<0.01)

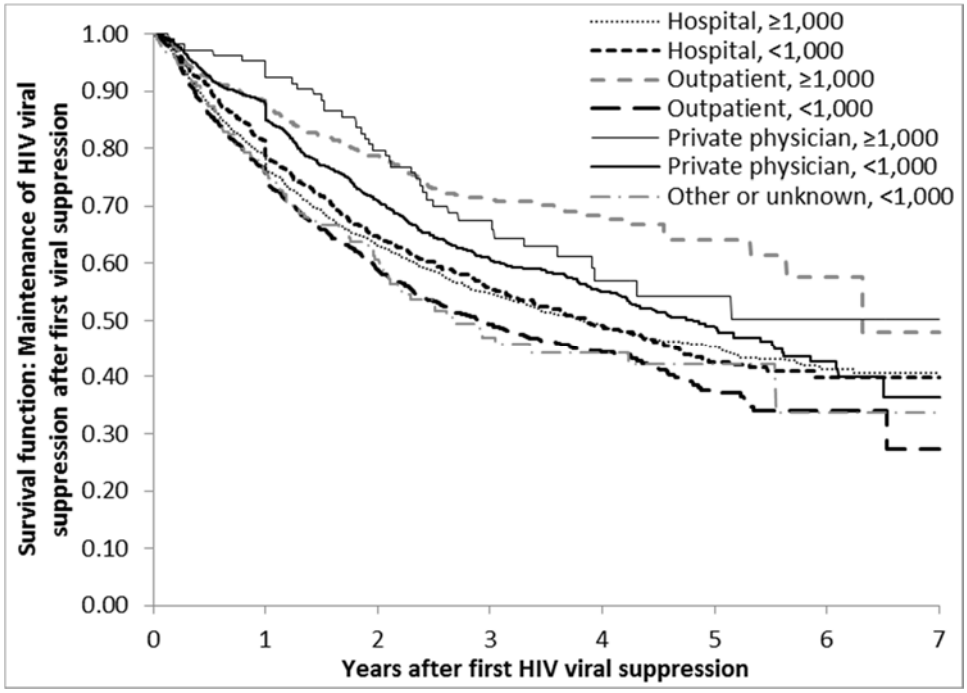
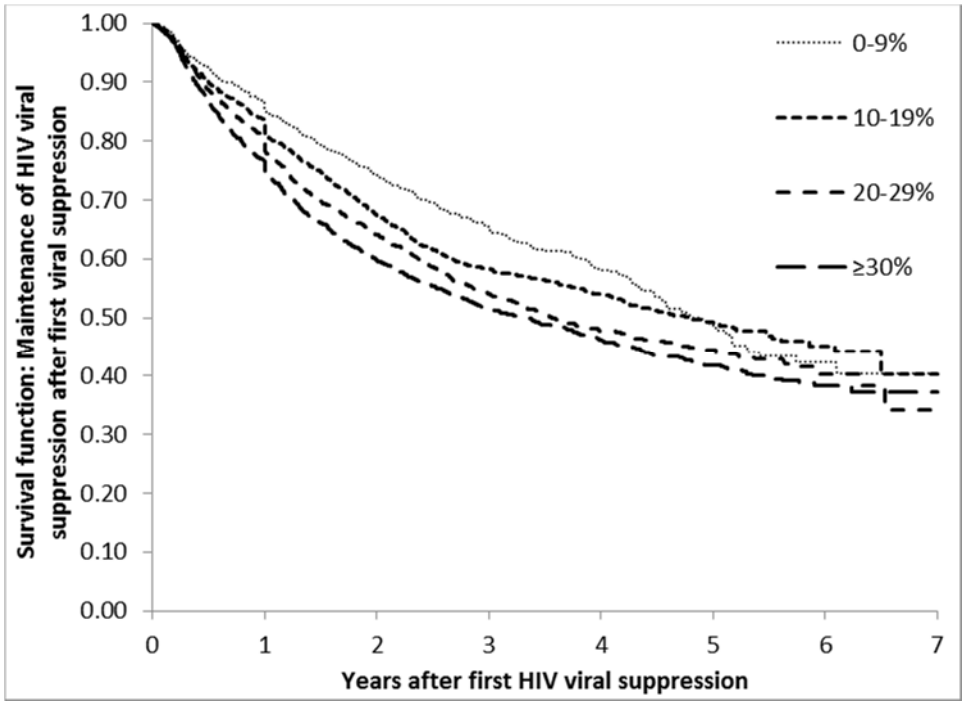


Figure 3.1c. By neighborhood poverty (percent of residents with incomes under the federal poverty threshold) (p<0.01)



Chapter 4. The association of perceived neighborhood social cohesion with achievement of HIV viral suppression among persons recently diagnosed with HIV and interviewed in New York City

Introduction

New York City (NYC) is home to more than 7% of all persons newly diagnosed with HIV in the United States (US) each year.[1, 2]. It is recommended that persons newly diagnosed with HIV have their viral load (VL) measured as soon as they begin HIV-related medical care and then at least every six months.[3] HIV infection typically is followed by a very high VL (e.g., >100,000 copies of HIV RNA per milliliter of blood) that eventually declines to lower levels that vary by individual. Further reduction of HIV VL to low or undetectable levels (e.g., ≤400 copies/mL) is referred to as viral suppression. Although a small percentage of persons (i.e., "elite controllers") is able to achieve suppression without treatment, most persons achieve suppression by being treated with antiretroviral therapy (ART).[4] Provided that the virus is sensitive to the multi-drug regimen chosen and the person is adherent, ART helps a person achieve suppression quickly (within 24 weeks) and durably.[5, 6]

Viral suppression not only slows progression of HIV disease [7] but also reduces the likelihood of onward sexual transmission.[8] As few as 20% of PLWHA were thought to be suppressed in the US in the early 2000s, while today most estimates exceed 50%;[10-14] in NYC, it was 59% in 2010.[14] In 2010, the US National HIV/AIDS Strategy set as a goal a 20% increase by 2015 in the proportion of persons in populations most affected by HIV (blacks, Hispanics, and gay and bisexual men) who are virally suppressed.[9] Updated national HIV treatment guidelines now recommend that all persons with HIV be offered ART.[3] However, until recently, it was recommended that persons begin ART only once immunocompromised, making immune status at diagnosis a key driver of treatment decisions. Although retention in care and ART are the main drivers of viral suppression, more rapid achievement of suppression has also been associated with individual-level demographic characteristics (e.g., older age,[13, 15, 20] male sex,[21-23] and non-black racial/ethnic category [13, 24-28]), and baseline clinical status indicators (e.g, CD4 count and VL[15, 29, 30]).

Studies focusing on individual-level factors affecting viral suppression may benefit from the addition of social and structural variables that have previously been associated with health and health-

seeking behavior, such as perceived neighborhood social cohesion. Lower perceived neighborhood social cohesion has been associated with lower primary care use among older urban adults.[44] Lower care use may, in turn, influence the time from HIV diagnosis to viral suppression because ART and VL testing are offered exclusively in the context of medical care visits. Low cohesion has also been associated with lower condom use and higher sexually transmitted infection (STI) rates among urban adolescents and young adults.[45, 46] Because STI can increase VL, social cohesion may affect viral suppression through condom use and STI rates. However, the association of social cohesion with HIV outcomes has not been examined. The availability of data on social cohesion for a sample of New Yorkers recently diagnosed with HIV allows the investigation of the effect of perceived neighborhood social cohesion on achievement of viral suppression among NYC residents who were diagnosed with HIV between 2006 and 2012 at ≥13 years of age. Findings could potentially be helpful in the development of interventions to increase suppression rates by accounting for a person's perception of neighborhood social cohesion and determining which persons may need additional support to achieve suppression.

Methods

Data sources

This retrospective analysis used data from the NYC HIV surveillance registry, the NYC arm of the CDC-coordinated Case Surveillance-Based Sampling project (CSBS),[53] and the 2007-2011 American Community Surveys.[55] The registry includes all persons diagnosed and reported with HIV in NYC since 2000 and all persons with AIDS since 1981. It gathers information by medical record review, provider report at diagnosis, and HIV-related laboratory tests, which are electronically reported to surveillance for all existing cases receiving diagnosis and/or care in NYC. Individual-level data acquired from the registry included demographic and clinical information collected at the time of first report, ZIP code of residence at diagnosis, and HIV-related laboratory test results from January 1, 2006, to June 30, 2014. Laboratory reports contain the test type, specimen collection date, result, and submitting provider or facility. Reports on existing cases are added to their surveillance registry record; reports not matching an existing case are sent out for field investigation to confirm the diagnosis and collect other registry data. All registry data were reported as of September 30, 2014, allowing a three-month reporting lag for laboratory tests performed through June 30, 2014.

CSBS is a surveillance activity that involves conducting in-person interviews and medical record reviews for a stratified random sample of persons from the registry. CSBS data are stored outside of the registry. Data from CSBS used for this analysis included individual-level information on household income, number of persons who depended on that income (a proxy for family size), highest educational level completed, and three questions aggregated to develop an index of perceived neighborhood social cohesion, as has been done previously.[45, 46] These CSBS variables were obtained from the interview portion of the 2012-2014 cycles of the study and recorded in the CSBS database by April 15, 2015.

Finally, neighborhood poverty statistics at the level of ZIP code tabulation area (ZCTA) were acquired from the 2011 American Community Survey 5-year estimates based on the 2007-2011 surveys. ZIP codes are a system of delineating areas for postal service, and most people know the ZIP code of their residence, while ZCTAs are geographic areas used by the American Community Survey as close geographic approximations of ZIP codes.[105] ZIP codes, which in NYC are typically larger than Census tracts but smaller than congressional districts and counties, were the smallest readily available geographic unit of analysis. Neighborhood poverty statistics were linked to cases through the ZIP code of patient residence at diagnosis.

Population

CSBS sampled 800 persons from the HIV surveillance registry across three annual sample cycles (200 persons in the 2012 cycle, 300 in 2013, and 300 in 2014). Each cycle's sample was stratified by diagnosis year to oversample persons diagnosed in more recent years and limited to persons ≥18 years of age as of the sample date. NYC residents who were interviewed for CSBS in 2012-2014, newly diagnosed with HIV between 2006 and 2012, and ≥13 years of age at diagnosis (which was potentially several years prior to the sample date) were eligible for the analysis. However, among the 294 persons located and interviewed for CSBS in 2012-2014, many were excluded: those who were not newly diagnosed with HIV between 2006 and 2012 and ≥13 years of age at diagnosis (n=152), did not have an NYC ZIP code of residence at diagnosis (n=9), died within 31 days after diagnosis (n=0), did not have a Western blot confirmatory test within 31 days post-diagnosis *and* were not diagnosed during acute HIV infection (i.e., their true diagnosis date was uncertain; n=6), had a suppressed (≤400 copies/mL) viral load ≤31 days after diagnosis (which suggests a misclassified diagnosis date; n=11), or did not respond to all

three questions about perceived neighborhood social cohesion (n=24). These exclusions yielded an analytical sample of 92 persons (see Appendix 2).

Outcome

The outcome of interest was the first suppressed VL (≤400 copies of HIV RNA/mL plasma) after HIV diagnosis. The cut-off was 400 copies/mL because this was the highest lower detectable limit of all VL assays in use during the study period.[59] Persons were censored at death or the end of the follow-up period, whichever came earlier. Follow-up time was calculated as the number of days from the date of HIV diagnosis to suppression, death, or 6/30/2014, whichever came first. There was no minimum required follow-up time. In addition to measuring this outcome as time-to-event, it was also measured dichotomously as having or not having achieved suppression within 12 months of diagnosis.

Treatment guidelines evolved during the analysis period but recommended that VL tests were conducted 2-4 times per year after HIV diagnosis. However, some persons with HIV may have had infrequent or no VL tests after diagnosis, because they were never linked to HIV-related medical care, they sought care infrequently, or their physician did not test their VL at every care visit. Any persons not known to be dead and with no suppressed VL (including persons with infrequent or no VL tests) were presumed not to be suppressed and contributed follow-up time as long as they were alive.

Independent variable

Perceived neighborhood social cohesion was calculated from participant agreement with three statements in the CSBS interview about trust, closeness, and helpfulness between neighbors, using a scored 1-4 Likert scale (see Appendix 8). [45, 46] Responses were summed to yield a score ranging from 3 to 12. Scores were dichotomized near the median, a natural break, placing approximately equivalent numbers of persons in each category.[46] The majority of scores were 6, 9, or 12 (>20% each), and 48% of persons had scores of 3-8 (see Appendix 8 for additional details, including results of our analyses were cohesion to have been classified as a three-level variable). Perceived neighborhood social cohesion was classified as low for persons with scores of 9-12 and high for persons with scores of 3-8; lower scores indicated agreement with positive statements about the neighborhood.

Covariates

Individual characteristics and neighborhood poverty were treated as potential confounders based on previous studies.[15, 31, 33] Demographic characteristics (age, sex at birth, race/ethnicity, country of

birth), HIV transmission risk (also referred to as transmission category), diagnosis date, viral loads, CD4 counts, and ZIP code of residence at diagnosis for calculation of neighborhood-level poverty were extracted from the NYC HIV surveillance registry. Estimated poverty status (at the individual/family level, based on household income) was calculated from CSBS data.

Age at HIV diagnosis was calculated from birth date and date of diagnosis and dichotomized as 13-29 years old and 30+.[2] Sex at birth was classified as male or female. Race (white or Caucasian, black or African American, Asian or Pacific Islander, and Native American) and ethnicity (Hispanic, non-Hispanic, or unknown) were collected through two questions and combined into a single variable that was dichotomized as: black or Hispanic, and other for those of other race/ethnicity. Country of birth was collected as country of birth when available or region of birth and categorized as born in the US or a US dependency (e.g., Puerto Rico), or a foreign country.

HIV transmission risk category was based on the self-reported pre-diagnosis risk behaviors of the case (e.g., injection drug use, male-male sex) and the sex, HIV status (e.g., HIV-positive), and risk (e.g., injection drug use) of the pre-diagnosis heterosexual sex partners reported by the person (which could indicate high-risk heterosexual risk).[69] This information was combined into hierarchical, mutually exclusive categories for the case: injection drug use (IDU), men who have sex with men (MSM), heterosexual sex, and other or unknown (which included perinatal transmission),[15] and these categories were then combined into three final groups: MSM, heterosexual, or other or unknown (which included injection drug users). To be classified as a heterosexual male or female, persons must have reported pre-diagnosis sex with a partner of the other sex who was HIV-infected, had injected drugs, or had received blood products. In addition, females only could be classified as heterosexual if they had probable heterosexual transmission noted in their medical record, reported sex with a male and no history of drug injection, or had any one of several behaviors associated with heterosexual transmission: history of prostitution, multiple sex partners, sexually transmitted disease, crack/cocaine use, or sex with a bisexual male.[2]

For analytic purposes, the year of diagnosis was determined from the earlier of physician diagnosis date or positive Western blot test result and grouped as 2006-2009 and 2010-2012. These were two approximately equal groups of years divided at a point when suppression became more likely

for everyone because of new HIV drug approvals and updated guidelines that encouraged earlier treatment initiation; also, few CSBS participants (n=6) were diagnosed in 2006 or 2007. CD4 count (if any) at diagnosis (i.e., within 3 months of diagnosis) and year of diagnosis vis-à-vis treatment guidelines were used to estimate treatment eligibility and as a proxy for receipt of ART, on the presumption that the majority of persons reaching the federal treatment threshold would receive ART. Treatment-eligible persons included those diagnosed in 2006-2007 with CD4<200, diagnosed in 2008-2009 with CD4<350, or diagnosed in 2010-2012 with CD4<500, reflecting changing treatment guidelines that increased the CD4 count at which ART initiation was recommended.[70-72] All other persons, including those with no reported CD4 counts, were not known to be eligible and were classified as not eligible.

Analyses included neighborhood-level poverty, defined as percent of residents in a ZIP code with incomes under the federal poverty threshold, from 2011 American Community Survey 5-year estimates.[74] We used this source because the 2010 decennial census did not collect poverty information, and because ZIP code of residence was collected (by the surveillance registry) at diagnosis. For those reasons, the 2011 American Community Survey 5-year estimates had the largest overlap with the diagnosis period (2006-2012). Because lower neighborhood-level socioeconomic status (SES) may be associated with both perceived neighborhood social cohesion and viral suppression, it was controlled for when exploring the relationship between perceived neighborhood social cohesion and suppression. The neighborhood poverty measure that we used has been associated with HIV and STI incidence and prevalence and HIV outcomes in the US and Canada.[31, 33, 39, 40, 47, 75] Neighborhood poverty was specified as <20% (i.e., <20% of residents had incomes below the federal poverty threshold; these were low- or medium-poverty neighborhoods) or ≥20% (high- or very-high-poverty), based on the four-category classification used by the NYC health department that this analysis collapsed into two categories.[76]

Estimated poverty status (at the individual/family level) was calculated based on responses in CSBS to questions about household income (which was collected in intervals) and number of persons who depended on that income. These were compared with US Census Bureau weighted average poverty thresholds for 2013 by size of family unit, and then classified as below the poverty threshold (and thus “poor”) or above (“non-poor”) (see Appendix 9 for details).[106]

Statistical analysis

Descriptive statistics for selected individual and neighborhood characteristics were calculated and presented for the overall population and according to suppression status within 12 months of diagnosis. Significance of associations between each variable and achievement of suppression within 12 months was assessed using Chi-square tests. The Mann-Whitney U test was used to ascertain differences in median days to suppression by the end of the follow-up period. The Spearman correlation coefficient was obtained to assess whether the dichotomized variable of perceived neighborhood social cohesion and neighborhood-level poverty were too correlated (i.e., $r>0.5$) to be in the same model.

Kaplan-Meier curves showing the number of days from diagnosis to suppression were generated by key individual and neighborhood characteristics, and log-rank tests were used to measure differences between groups.

We used Cox proportional hazards regressions to estimate the association of individual and neighborhood factors with suppression in crude and adjusted models. Because of the small sample size, we did not account for correlations of individual outcomes within neighborhood (ZIP code).[62, 63] Unadjusted models were fitted to estimate the unadjusted hazards of viral suppression for each individual and neighborhood characteristic. In addition, several multivariable models were fitted, striving for parsimony given the small sample size. Our final model included age at HIV diagnosis, sex at birth, race/ethnicity, year of HIV diagnosis, and ART eligibility, for consistency with previous models of viral suppression,[15] as well as perceived neighborhood social cohesion and neighborhood-level poverty.

All analyses were conducted using SAS 9.2 (SAS Institute, Cary, NC). Ethical approval for these analyses was provided by the Institutional Review Boards of Lehman College of the City University of New York and of the NYC Department of Health and Mental Hygiene.

Results

Descriptive statistics

Of 92 New Yorkers newly diagnosed with HIV in 2006–2012 and interviewed by CSBS, approximately three-quarters were male (72.8%), and black or Hispanic (82.6%; Table 4.1). More than half were ≥30 years old (66.3%), born in the US or a US dependency (68.5%), MSM (51.1%), diagnosed in 2010-2012 (54.3%), not eligible to receive treatment based on CD4 count and diagnosis year (53.3%),

poor (60.9%), perceiving low neighborhood social cohesion (52.2%), and residents of high- or very-high-poverty neighborhoods (57.6%).

Sixty-five percent of the population achieved suppression within 12 months of diagnosis (Table 4.1). Suppression rates at 12 months were lower among persons who were younger (45.2% of persons 13-29 years old achieved suppression vs. 75.4% of persons ≥30), black or Hispanic (59.2% vs. 93.8%), born in the US or a US dependency (57.1% vs. 82.8%), and not eligible for treatment (46.9% vs. 86.0%; all *p*-values<0.05). Differences in suppression at 12 months between persons reporting low cohesion (60.4%) and high cohesion (70.5%) were not significant (p=0.31).

Almost the entire population (95.7%) achieved viral suppression by 6/30/2014 (not shown), in a median of 180 days (Table 4.1). Suppression happened least quickly among persons who were younger (median=377 days), black or Hispanic (203 days), born in the US or a US dependency (218 days), not known to be eligible for treatment (372 days), or who had low perceived neighborhood social cohesion (204 days; all *p*-values <0.05). Differences were most prominent by age (median=164 days among persons ≥30 years old vs. 377 days among 13-29) and treatment eligibility (159 days among eligible vs. 372 days among not eligible). Kaplan-Meier survival curves demonstrated the lack of difference in achievement of suppression between persons with low and high perceived neighborhood social cohesion (p=0.95; Figure 4.1a), the difference between persons eligible and not eligible for treatment (p<0.01; Figure 4.1b), and the lack of difference between residents of high- or very-high-poverty vs. low- or medium-poverty neighborhoods (p=0.46; Figure 4.1c).

The Spearman correlation coefficient between perceived neighborhood social cohesion and neighborhood-level poverty was 0.24 (analysis not shown in tables), indicating a low correlation, and thus, suggesting that they capture independent constructs.

Unadjusted and adjusted models

Table 4.2 presents the unadjusted and adjusted HRs for HIV viral suppression among CSBS participants newly diagnosed with HIV in NYC. The unadjusted HRs show that perceived neighborhood social cohesion was not associated with suppression. Persons who were black or Hispanic, born in the US or a US dependency, diagnosed in 2006-2009, or not eligible for treatment were at least 42% less likely to achieve viral suppression (range 42% to 60%) than others.

Multivariable regression included perceived neighborhood social cohesion, age at HIV diagnosis, sex at birth, race/ethnicity, year of HIV diagnosis, ART eligibility, and neighborhood-level poverty. Perceived neighborhood social cohesion was not associated with suppression in the fully adjusted model, nor were year of diagnosis or neighborhood-level poverty, which were among the potential confounders included. The likelihood of viral suppression was 55% lower for blacks or Hispanics (95%CI=0.23-0.86) than persons of another race/ethnicity, and 42% lower among persons not eligible for treatment (95%CI=0.35-0.96) than treatment-eligible persons, after adjustment. Compared with a model with variables for age at HIV diagnosis, sex at birth, race/ethnicity, year of HIV diagnosis, treatment eligibility, and neighborhood-level poverty, this model which added cohesion did not have significantly better fit (-2LL: 618.149; p=0.3372; see Appendix 10).

It is worth noting that these adjusted results for social cohesion remained similar when using a three-level rather than dichotomous variable (see Appendix 8).

Discussion

Controlling for individual characteristics and neighborhood poverty, perceived neighborhood social cohesion did not influence the time from HIV diagnosis to viral suppression. However, persons who were black or Hispanic and who were not eligible for treatment were less likely to achieve HIV viral suppression after diagnosis.

Our findings were not consistent with previous studies that have found a relationship between perceived neighborhood social cohesion and care-seeking behavior or STI outcomes.[44-46] Our study may have been underpowered to detect an effect of cohesion on suppression. However, it is also possible that cohesion is not associated with condom use, STIs, and care-seeking behaviors among persons with HIV in NYC, or that other factors may prevent social cohesion from influencing time to suppression. For example, the system of care and services, benefits, and large HIV-positive population in NYC make it a relatively attractive place for HIV-positive persons to live and receive care. These factors may affect the time to suppression regardless of neighborhood cohesion.

Findings about race/ethnicity and treatment eligibility were consistent with a previous study using NYC HIV surveillance data.[15] Treatment eligibility and suppression were associated with each other presumably because treatment-eligible persons were more likely to have been prescribed ART, almost

the exclusive means of lowering viral load. However, our findings on poverty were not consistent with previous studies; neighborhood-level socioeconomic factors have been associated with HIV diagnosis rates and some care-related outcomes in NYC and elsewhere.[31, 33, 38-42] Possible explanations for this inconsistency include: different outcomes (e.g., time from ART initiation to suppression vs. time from diagnosis to suppression); different settings (e.g., Canada vs. US, or other US areas vs. NYC); HIV care is perhaps comparably accessible and effective regardless of characteristics of the NYC neighborhood in which people live, mitigating neighborhood-level disadvantage after diagnosis; and publication bias may have limited the publication of previous null findings on neighborhood characteristics and HIV outcomes.[82, 83]

Limitations

As in any population-based analysis of HIV care, ours had VL data only when persons sought care, which was at their discretion. Persons in this analysis were not necessarily tested at regular intervals. Persons may have achieved suppression sometime before it was measured in a VL test. It is not clear whether these circumstances would have biased our hazard ratios. However, all persons in the analysis had at least one VL test between 8 days post-diagnosis and censoring. Persons diagnosed in 2009, for example, had a median of 13 VL tests (IQR: 7-17), and the median interval between tests was 140 days (<5 months; IQR: 106-264 days). Persons diagnosed in 2012 had a median of 8 tests (IQR: 6-10) and the median interval between tests was 85 days (<3 months; IQR: 67-98 days). These statistics indicate that the majority of New Yorkers recently diagnosed with HIV and interviewed by CSBS were engaged in care at intervals that were both consistent with federal guidelines and sufficiently frequent to produce estimates of suppression. Thus, it is unlikely that the lack of regular testing would have influenced our results.

Persons in this analysis were interviewed by CSBS, numbered fewer than 100 (n=92), and nearly universally achieved suppression by the end of the follow-up period. That these persons could be found in NYC and were sufficiently available for an interview suggests that they may differ from other recently diagnosed and reported New Yorkers, i.e., they may be more likely to still be living in NYC, be in care, and achieve suppression, although it is unclear whether this might affect the relationship between cohesion and suppression. Similarly, analyses of persons with HIV in NYC (who were not necessarily

recently diagnosed, unlike our analysis population) found that many reported to surveillance appeared to no longer live in NYC, and when those were excluded, the rates of care were higher.[14]

This analysis was conducted with a small population considering the numerous factors we sought to control for in multivariable analysis, and the study may have been underpowered. A post-hoc power calculation found that this study had only a 17% chance of rejecting the null hypothesis (i.e., no difference in suppression by perceived neighborhood social cohesion level).[107] It may also be that persons certainly in NYC (in this analysis, indicated by having been interviewed by CSBS) have high rates of suppression and that differences by subgroups are relatively small, offering an alternative explanation of why only a few characteristics were significantly associated with suppression. A previous study of newly diagnosed persons who, according to surveillance records, appeared never to have entered HIV care found that three times as many of these persons reported that they were in fact in care as the number who agreed that they were out of care.[108] With near-universal care engagement among persons completing CSBS interviews, subgroup differences in suppression may indeed be minor, supporting our findings that few factors measured by surveillance or the CSBS interview instrument were associated with suppression.

There are several steps between diagnosis and suppression in the continuum of care for HIV-positive persons.[10, 13] By design, this analysis did not elucidate the exact step(s) at which the factors measured affect suppression. This means that the associations that we found exist for the overall process from diagnosis to suppression but not necessarily for individual steps between them. For example, cohesion may not influence time from diagnosis to linkage of care but rather only time from linkage to suppression.

Strengths

This is the first analysis to investigate the influence of perceived neighborhood social cohesion on HIV outcomes, and among the first US analyses to use surveillance data to investigate the role of neighborhood factors on HIV outcomes. [31, 33, 35, 45, 46, 87] The data were drawn from the population-based HIV surveillance system of the city with largest HIV epidemic in the US, including only persons confirmed (by locating them at an NYC address) to still be in the jurisdiction. Data from multiple sources were used to assess the potential influence on viral suppression of factors beyond the individual. Mandatory electronic reporting of laboratory tests in NYC provided information about all measured VLs for

all HIV-positive persons receiving care in NYC, as opposed to in a clinical trials environment, where findings can differ from those in a population setting.

Conclusions

New Yorkers recently diagnosed with HIV, confirmed to be in NYC, and available for interview have almost universally achieved viral suppression. Being non-black or non-Hispanic and eligible for ART was associated with faster viral suppression after diagnosis, presumably leading to improved health and preventing ongoing HIV transmission. In contrast, individuals with characteristics associated with slower achievement of suppression may need more assistance after diagnosis with linkage to and retention in care or acquiring and adhering to ART. For example, black and Hispanic persons may benefit from more-frequent medical care and prescription of ART, including equitable prescribing behavior and/or better adherence support.[92] These changes may have the potential to raise suppression rates among blacks and Hispanics to levels that are comparable to those among whites.[15, 22, 25-27, 91] The racial/ethnic disparity in viral suppression was not related to estimated poverty status nor neighborhood poverty. Since 2010, New York State law has required all providers to link positive patients to care, and the United States Department of Health and Human Services now encourages antiretroviral therapy for all diagnosed persons, regardless of CD4 count, which should further the improvement in suppression rates. Future studies should explore the extent to which persons who can be located for a CSBS interview are representative of persons with HIV in NYC.

Table 4.1. Achievement of HIV viral suppression among a stratified random sample of persons newly diagnosed with HIV in New York City in 2006-2012 who were interviewed and followed through June 2014

	Total	Not virologically suppressed within 12 months	Virologically suppressed within 12 months			Median time from diagnosis to suppression	
	Distribution (n)	Distribution (n)	Distribution (n)	Prevalence	*p*-value[1]	Median (IQR[2]) days	*p*-value[3]
Total	***100.0 (92)***	***100.0 (32)***	***100.0 (60)***	***65.2***		***180 (307)***	
Perceived neighborhood social cohesion					0.3126		0.0194
Low cohesion	52.2 (48)	59.4 (19)	48.3 (29)	60.4		204 (435)	
High cohesion	47.8 (44)	40.6 (13)	51.7 (31)	70.5		168 (234)	
Age group (years) at diagnosis					0.0040		0.0017
13 - 29	33.7 (31)	53.1 (17)	23.3 (14)	45.2		377 (600)	
≥30	66.3 (61)	46.9 (15)	76.7 (46)	75.4		164 (138)	
Sex at birth					0.8810		1.0000
Male	72.8 (67)	71.9 (23)	73.3 (44)	65.7		180 (366)	
Female	27.2 (25)	28.1 (9)	26.7 (16)	64.0		189 (323)	
Race/Ethnicity					0.0085		0.0060
Black or Hispanic	82.6 (76)	96.9 (31)	75.0 (45)	59.2		203 (390)	
Another race/ethnicity	17.4 (16)	3.1 (1)	25.0 (15)	93.8		136 (99)	
Country of birth					0.0165		0.0003
US or US dependency	68.5 (63)	84.4 (27)	60.0 (36)	57.1		218 (428)	
Foreign	31.5 (29)	15.6 (5)	40.0 (24)	82.8		135 (84)	
HIV transmission risk					0.2998		0.5434
Men who have sex with men	51.1 (47)	53.1 (17)	50.0 (30)	63.8		186 (293)	
Heterosexual	31.5 (29)	37.5 (12)	28.3 (17)	58.6		210 (352)	

Other or unknown	17.4 (16)	9.4 (3)	21.7 (13)	81.3		168 (105)	
Year of HIV diagnosis					0.0536		0.2015
2006 – 2009	45.7 (42)	59.4 (19)	38.3 (23)	54.8		200 (768)	
2010 – 2012	54.3 (50)	40.6 (13)	61.7 (37)	74.0		171 (203)	
Eligible for treatment					<0.0001		0.0057
Yes	46.7 (43)	18.8 (6)	61.7 (37)	86.0		159 (119)	
No	53.3 (49)	81.3 (26)	38.3 (23)	46.9		372 (735)	
Estimated poverty status					0.5073		0.1915
Non-poor	39.1 (36)	43.8 (14)	36.7 (22)	61.1		201 (297)	
Poor	60.9 (56)	56.3 (18)	63.3 (38)	67.9		173 (320)	
Percent of population below federal poverty threshold in past 12 months					0.2558		0.0869
Low or medium (<20%)	42.4 (39)	34.4 (11)	46.7 (28)	71.8		171 (312)	
High or very high (≥20%)	57.6 (53)	65.6 (21)	53.3 (32)	60.4		199 (308)	

[1] *p*-value: Chi-square or (when cells had expected counts <5) Fisher's exact test of association between each variable and achievement of suppression

[2] IQR: Interquartile range, i.e., 3rd quartile minus 1st quartile

[3] *p*-value: Mann-Whitney U test of differences by each variable in median days to suppression

Table 4.2. Proportional hazards regressions of HIV viral suppression among a stratified random sample of persons newly diagnosed with HIV in New York City in 2006-2012 who were interviewed and followed through June 2014

	HR[1] (95% CI)	AHR[2] (95% CI)
Perceived neighborhood social cohesion		
Low cohesion	1.00	1.00
High cohesion	0.99 (0.64-1.51)	0.79 (0.49-1.28)
Age group (years) at diagnosis		
13 - 29	0.69 (0.44-1.08)	0.64 (0.38-1.09)
≥30	1.00	1.00
Sex at birth		
Male	0.93 (0.58-1.50)	0.95 (0.57-1.60)
Female	1.00	1.00
Race/Ethnicity		
Black or Hispanic	0.40 (0.23-0.69)	0.45 (0.23-0.86)
Another race/ethnicity	1.00	1.00
Country of birth		
US or US dependency	0.48 (0.30-0.77)	
Foreign	1.00	
HIV transmission risk		
Men who have sex with men	0.94 (0.58-1.50)	
Heterosexual	1.00	
Other or unknown	1.19 (0.63-2.24)	
Year of HIV diagnosis		
2009 - 2009	0.58 (0.37-0.91)	0.63 (0.38-1.05)
2010 - 2012	1.00	1.00
Eligible for treatment		

Yes	1.00	1.00
No	0.45 (0.29-0.70)	0.58 (0.35-0.96)
Estimated poverty status		
Non-poor	0.80 (0.52-1.24)	
Poor	1.00	
Percent of population below federal poverty threshold in past 12 months		
Low or medium (<20%)	1.00	1.00
High or very high (≥20%)	0.61 (0.28-1.34)	1.00 (0.98-1.02)

[1] HR: Hazard ratio; CI: confidence interval

[2] AHR: Adjusted hazard ratio

Figure 4.1. Kaplan-Meier survival curves of time from HIV diagnosis to viral suppression among a stratified random sample of persons newly diagnosed with HIV in New York City in 2006-2012 who were interviewed and followed through June 2014

Figure 4.1a. By perceived neighborhood social cohesion (*p*=0.95)

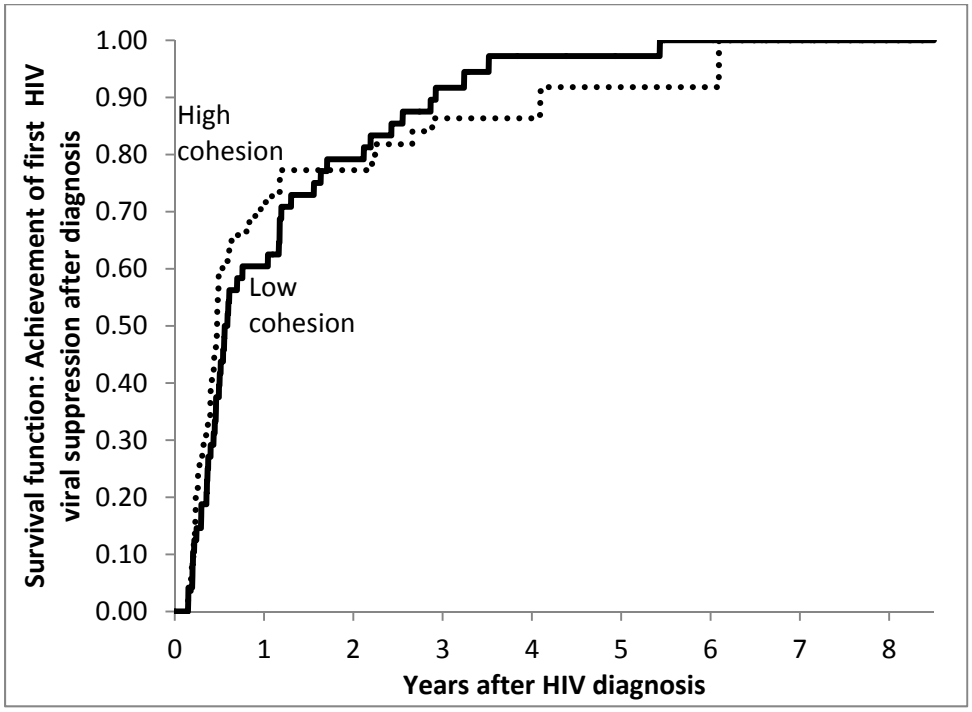


Figure 4.1b. By eligibility for antiretroviral therapy (ART) at diagnosis (p<0.01)

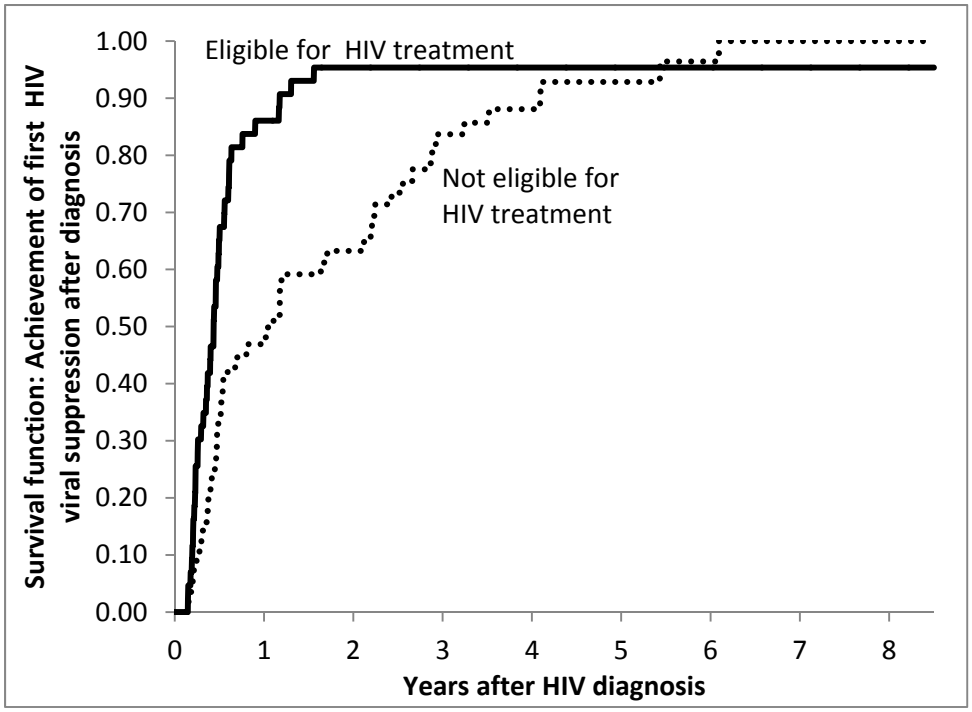
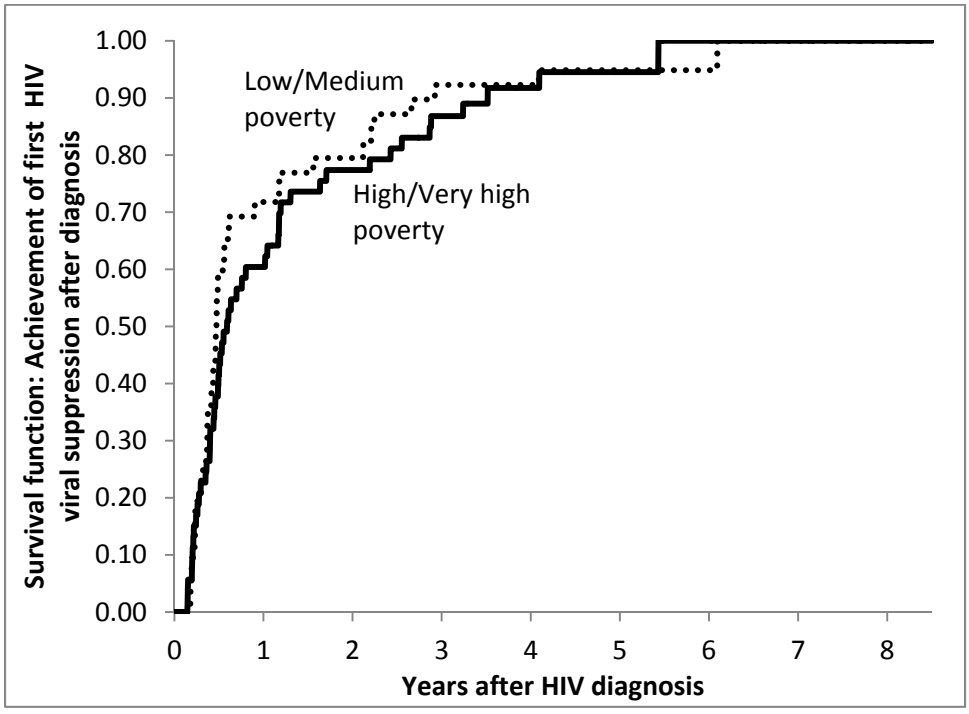


Figure 4.1c. By neighborhood-level poverty (p=0.46)



Chapter 5. Discussion

Overview

We measured the association of individual, facility, and neighborhood characteristics with the achievement and maintenance of HIV viral suppression among NYC residents diagnosed with HIV between 2006 and 2012. The dates of HIV diagnosis, viral suppression, and virologic failure were assessed using the NYC HIV surveillance registry, which included all persons diagnosed or receiving care in NYC as well as electronic reports of all of their subsequent viral load tests in NYC. Facility-level characteristics were obtained from the registry and based on facility of diagnosis or of first suppression. Finally, neighborhood-level characteristics were acquired from the US Census and American Community Survey based on Census tract or ZIP code of residence. The association of perceived neighborhood social cohesion with suppression was assessed for recently diagnosed New Yorkers interviewed by CSBS. For each analysis, the distribution of characteristics in the analytic population, the proportion achieving the outcome of interest within 12 months, and the median time to the outcome were presented. Kaplan-Meier curves were generated and log-rank tests performed to test for differences between subgroups in the likelihood of suppression. Then multivariable proportional hazards regressions were fitted to assess the likelihood of suppression or failure by individual, facility, and neighborhood characteristics, accounting for clustering of outcomes by facility or neighborhood whenever the sample size allowed it. Main findings and interpretations are reviewed in the following section.

Summary of findings

Chapter 2

This chapter assessed the association of individual, facility, and neighborhood factors associated with achievement of viral suppression after diagnosis among New Yorkers newly diagnosed with HIV in 2006-2010 (Aim 1). Of 12,547 New Yorkers newly diagnosed with HIV in 2006–2010, approximately three-quarters were 20-49 years old (78.7%), male (74.2%), and black or Hispanic (81.5%); and almost one-third were eligible to receive treatment based on CD4 and diagnosis year (30.6%). Forty-four percent of the population achieved suppression within 12 months of diagnosis, with a median time to suppression of 245 days. Suppression was achieved most slowly among persons who were younger,

diagnosed in earlier years, not known to be eligible for treatment, and diagnosed at non-hospital facilities and facilities farther from the patient's residence.

In proportional hazards models adjusting for individual and facility or neighborhood characteristics, we observed that persons 13-49 years old, men, blacks and Hispanics, US-born, heterosexuals, persons diagnosed in 2006 and 2008 were less likely to achieve suppression than those 60 and older, women, whites, foreign-born, MSM, and persons diagnosed in 2010, respectively. This was also observed for persons not eligible for treatment vs. treatment-eligible persons, and persons diagnosed at facilities that diagnosed 10-74 patients per year vs. facilities that diagnosed ≥75 patients per year, that were screening/diagnosis/referral sites vs. hospitals, or that were <1 mile from the patient vs. 1 to <5 miles. Neighborhood-level poverty, unemployment, and percent black residents were not associated with suppression.

Chapter 3

This chapter used the subset of persons from the previous aim's analytical sample who achieved viral suppression to assess the individual, facility, and neighborhood factors associated with maintenance of viral suppression (Aim 2). Of 8,927 New Yorkers newly diagnosed with HIV in 2006–2010 who achieved viral suppression, almost one-fifth (18.2%) experienced failure within 12 months of suppression with an overall median time to failure of 728 days, i.e., about two years after first suppression.

Adjusting for individual and facility or neighborhood characteristics, proportional hazards models show the following groups to be the least likely to maintain suppression: younger persons (<50 years old vs. ≥60), blacks and Hispanics, US- and US-dependency born persons, heterosexuals and injection drug users, persons with CD4 counts ≥500 cells/mL at suppression, persons receiving care at facilities that were not large outpatient facilities or large private practices, and residents of high- or very-high-poverty neighborhoods.

Chapter 4

This chapter assessed individual and neighborhood factors, particularly perceived neighborhood social cohesion, associated with achievement of viral suppression after diagnosis, among a sample of New Yorkers newly diagnosed with HIV in 2006-2012 (Aim 3). Out of 92 New Yorkers newly diagnosed with HIV in 2006–2012 and interviewed by CSBS, 65% achieved suppression within 12 months of diagnosis. Almost the entire population (95.7%) achieved viral suppression by the end of the follow-up

period on June 30, 2014, with a median of 180 days. Kaplan-Meier curves indicated no difference in time to suppression by perceived neighborhood social cohesion. In regression adjusting for age at HIV diagnosis, sex at birth, race/ethnicity, year of HIV diagnosis, ART eligibility, and neighborhood poverty, perceived neighborhood social cohesion was not associated with suppression.

Limitations

As in any population-based analyses of HIV care, ours had VL data only when persons sought care, which was at their discretion. Persons in our analyses were not necessarily tested at regular intervals. Thus, they may have achieved suppression or failure sometime before it was measured in a VL test. It is not clear whether these circumstances would have biased our hazard ratios. However, the majority of New Yorkers newly diagnosed with HIV between 2006 and 2012 were in fact engaged in care as frequently as was recommended by federal guidelines.

Persons not receiving care in NYC were presumed to be present and unsuppressed (in the analyses of time to suppression) or maintaining suppression for 12 months (in the analysis of time to failure), although they may have moved out of NYC and become suppressed or experienced failure elsewhere. Non-ascertainment of outmigration is a typical limitation of local HIV surveillance data and may be differential across subgroups. For example, if outmigration happened more frequently among men, which has been reported previously,[85] this could exacerbate the male-female disparity in suppression rates.

For the Aim 3 analysis, the analytical sample was fewer than 100 and with higher suppression rates than newly diagnosed persons citywide. We were underpowered to detect a difference in suppression between persons perceiving low vs. high neighborhood social cohesion. That these persons could be found and interviewed suggests that they may have higher rates of care than other newly diagnosed New Yorkers.[14] However, they may not necessarily have different predictors of suppression otherwise. A previous analysis of all NYC residents newly diagnosed with HIV found younger age and earlier year of diagnosis to be associated with delayed suppression.[15, 109] Alternatively, it may be that persons certainly in NYC (such as CSBS participants) have high rates of suppression and that differences between subgroups are relatively small.

There are several steps between diagnosis and suppression in the "care continuum" for HIV-positive persons.[10, 13] By design, our analyses did not elucidate the exact step(s) of the continuum – diagnosis, linkage to care, retention in care, provision of ART, or viral suppression – at which the characteristics studied affect suppression.

Strengths and public health significance

These are among the first analyses in the US to investigate the influence of facility and neighborhood, and the first to assess the influence of perceived neighborhood cohesion, on HIV outcomes using surveillance data,[31, 33, 35, 45, 46, 87] The data were drawn from population surveillance in a diverse city with the largest HIV epidemic in the US. Analyses combined data from multiple sources to assess the potential influence on the achievement and maintenance of viral suppression of factors beyond the individual. Mandatory electronic reporting of laboratory tests in NYC provided information about all measured VLs for all HIV-positive persons receiving care in NYC, as opposed to in a clinical trials environment, where findings can differ from those in a population setting. This makes our results generalizable to the population of NYC residents with HIV. To assign area-based characteristics to individuals, we used, whenever available, patient address geocoded to the Census tract, which is the gold standard for detection of public health disparities.[47] Aim 3 data included only persons confirmed (by locating them at an NYC address) to still be in the jurisdiction. This ensures that factors found to be associated with suppression are truly that, and not simply proxies for continued residence in NYC.

Policy recommendations and future research directions

We have identified individual, facility, and neighborhood characteristics that seem to help persons newly diagnosed with HIV to achieve and maintain viral suppression, and thus, improve their health and prevent ongoing HIV transmission. These individuals, health care facilities, or neighborhoods with characteristics associated with slower achievement of suppression may need more assistance with post-diagnosis linkage to and retention in care, ART prescribing, or adherence. Such supports might include care coordination, case management, behavioral counseling, strategic planning about the locations of facilities, or additional training for physicians. Below we describe the implications of our findings in each of these arenas in more detail as well as revisit the issue of study design and interviews of persons with

HIV. Our findings may be valuable to agencies planning testing programs, medical care for individuals with HIV, and "prevention with positives" programs. The agencies may wish to evaluate their effectiveness with these populations and/or expand their scope to reach most-affected groups or neighborhoods. Our findings may also help strengthen existing programs that appear to be working, such as the NYC care coordination program and housing services,[66, 67] or help explain why others may not work. For example, they may wish to place additional focus on individuals, facilities, or neighborhoods with characteristics associated with poorer achievement or maintenance of suppression; or review programs that help patients achieve relatively high rates of good outcomes in spite of challenges (i.e., serving persons who typically have poorer outcomes), as potential examples of best practices.

Individual characteristics

Several individual characteristics had previously been found to be associated with the achievement and maintenance of suppression,[15, 20, 21] and our adjusted analyses confirmed these associations. For example, persons who were older, white, foreign-born, diagnosed in later years, MSM, and eligible for ART were more likely to achieve and maintain suppression. Changing treatment guidelines favoring universal consideration of ART initiation will likely minimize the association of CD4 count (and somewhat, by extension, age) with suppression, but disparities by stage of illness and other factors, such as demographics, may remain. For example, black persons need better HIV-related care and/or support that permits them to receive optimal ART regimens and achieve and maintain suppression at comparable rates as whites;[15, 22, 25-27, 91] rectifying this disparity, which Chapter 4 suggested was related to individual race/ethnicity and not individual poverty status, neighborhood poverty, or neighborhood racial composition, may require more equitable prescribing behavior and/or better adherence support.[92]

Health care facility characteristics

We found a few associations between distance from a person's residence to their health care facility and achievement and maintenance of suppression. The extensiveness of NYC's systems of HIV care and public transportation,[97] coupled with New York State's generous benefits and services for

persons with HIV,[98] may have helped minimize the impact of patient-provider distance on virologic suppression failure.

NYC can continue to encourage HIV testing at large facilities, including hospitals, where patients have the greatest likelihood of reaching suppression quickly. We can also increase the technical capacity of certain types of facilities, namely those that make fewer diagnoses annually, or that are neither hospitals nor private physicians' offices. These types of facilities need to do a better job at moving their patients along the continuum of care from diagnosis to suppression. An alternative solution may be ensuring effective linkage to care at a different type of site, such as one that has cared for more HIV-positive patients. Health care facilities where patients have better achievement and maintenance of suppression could be examined for their "best practices" and these practices considered either for scale-up across facilities or as recommendations of which types of facilities have the potential to provide the best care.

Several developments are encouraging all New Yorkers diagnosed with HIV to move along the continuum of care. Since 2010, New York State law has required all providers to link HIV-positive patients to care.[110] The United States Department of Health and Human Services now encourages antiretroviral therapy for all diagnosed persons, regardless of CD4 count.[3] Both sets of guidelines should further the improvement in suppression rates. Future studies should monitor whether facility-level disparities in suppression decrease over time, as more facilities presumably adhere to the law.

Neighborhood characteristics

We found that neighborhood-level poverty influences maintenance of suppression but not achievement of suppression. This suggests that the many resources available for low-income PLWHA in NYC to receive care, medication, and other forms of support may reduce but not entirely eliminate the negative effects of poverty on HIV-related health outcomes. It is possible that the effects of neighborhood-level poverty would have been even larger in a setting other than NYC that may not have been as well-resourced vis-à-vis medical facilities and transportation system. Still, rectifying the disparity in maintenance of suppression between residents of poorer and wealthier neighborhoods may require

targeted adherence support services or additional general poverty alleviation, including increased units of subsidized and/or supportive housing.

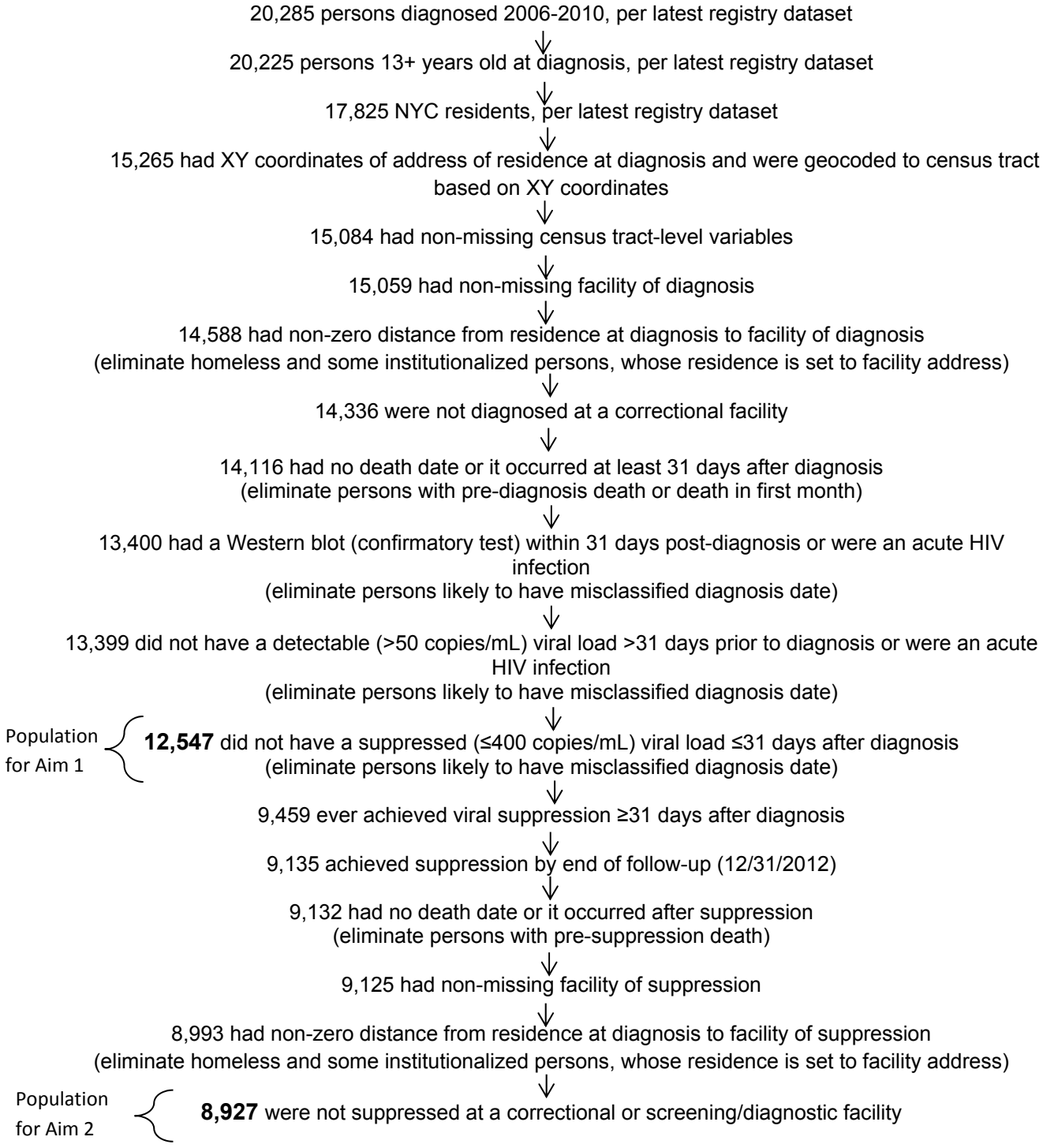
Study design

We found near-universal care engagement and viral suppression among persons completing CSBS interviews, while figures among newly diagnosed PLWH overall were more modest. Future studies should explore the extent to which persons who can be located for an interview are representative of persons with HIV in NYC.

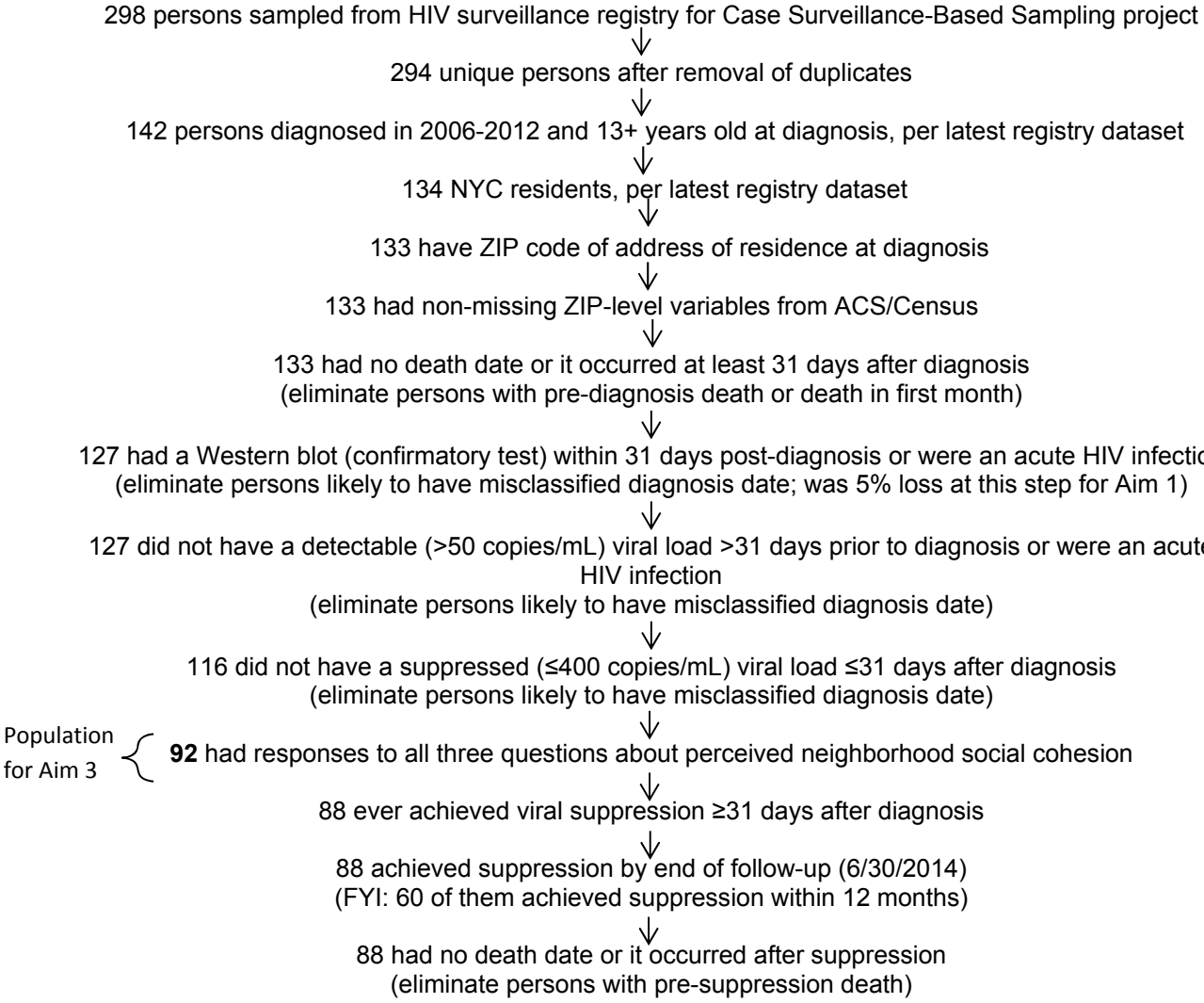
Conclusions

Our analyses are among the first in the US to reveal facility and neighborhood characteristics associated with achievement and maintenance of viral suppression among persons newly diagnosed with HIV. We confirm that several individual characteristics appear to also influence suppression, but perceived neighborhood social cohesion may not. We rely on population surveillance and interviews of persons sampled from surveillance, and matched both with US Census Bureau data to obtain information on neighborhood-level characteristics. Our results from Aims 1 and 2 are generalizable to the population of persons living with HIV in NYC, and further exploration of the representativeness of persons with HIV who can be located for an interview would be valuable. Increases in post-diagnosis linkage to and retention in care, and receipt of and adherence to ART, that reach groups of persons, patients at facilities, or residents of neighborhoods that we found to have poorer outcomes, may improve the achievement and maintenance of viral suppression in NYC.

Appendix 1. Populations for analyses of achievement (Aim 1) and maintenance (Aim 2) of HIV viral suppression among newly diagnosed New Yorkers



Appendix 2. Population for analysis of HIV viral suppression among recently diagnosed and interviewed New Yorkers (Aim 3)



Appendix 3. Creating a dataset of individual, neighborhood, and facility characteristics, January – May 2014

January 16 and 17, 2014 – Preparing individual-level dataset; reading in area-level variables

SAS

Added correctional variables, individual-level variables, first VL, first CD4, and provider XY coordinates. They are in a single completed SAS program and saved in a permanent SAS dataset called IndivSurvDataForGCCases_20140117. "GCCases" refers to geocoded cases.

Began a SAS program to read in and combine area-level datasets. Read in all ACS datasets and need to refer to Excel list at home of neighborhood-level variables, since some ACS datasets have hundreds of variables and the Excel list identifies the exact variable needed. Not all datasets have the same format for the geographic variables describing CT, so those will need to be made into the same format before merging.

Outcome

Finalized dataset with individual-level variables. Need to continue reading in and combining area-level variables. Have patient and provider XY coordinates and at some point need to do network analysis to calculate distance between them.

January 21, 2014 – Compiling area-level variables

SAS

Continued SAS program to read in and combine area-level datasets. Read in all needed CT-level ACS and Census data. Compared poverty datasets from ACS downloads done by borough and for NYC overall, and CT-level poverty stats between the two appeared to be a perfect match, which was reassuring. Converted all percentages into the same format (e.g., xx.x), since some were formatted as xx.x%, and formatted geographic info the same across datasets (as GEO_display_label in ACS was formatted) so they can be merged. Apparently there are 2,168 Census tracts in NYC with population data; this is the number of observations in the final area-level dataset.

January 23, 2014 – Creating permanent dataset of area-level variables

SAS

Finished program for CT-level data and saved permanent copy.

BES/DTF slides from approx. 1/16/2014 on combined/split CTs and ZIPs suggest that one ZIP perhaps should be combined with another.

January 28-30, 2014 – Creating facility-level variables, adding Aim 2 maintenance/failure variables, combining datasets across levels

SAS

Wrote code to determine number of cases diagnosed per provider per year (hars_name, hivdxdtafter year in hivepi.harsoct13sm for 2005-2010), number of unique patients seen per provider per year (hars_name, eventdate year of CD4/VL in care.vlcd4wbprovoct13 for 2005-2010), and facility type (provider and

providercode in hesp.pv_provider as of 1/30/2014, and DACs per NYS and NYC lists from 1/2006 – 2013). Saved datasets. Had to run on P because did it after 7pm when N was not available, then transferred datasets, SAS code, and DAC lists to N.

Revisited SAS program for individual-level data to add variables for Aim 2, e.g., 1st CD4 within 1 month before or after 1st suppressed VL, provider at 1st suppressed VL, and maintenance of suppression (i.e., failure per VL >400 or >1,000 or >366 days without a test).

Began SAS code to combine individual, neighborhood, and facility-level datasets.

January 31 and February 3-4, 2014 – Completing dataset for Aims 1 and 2, ruling out possibility of patient-provider XY distance network analysis

SAS

Checked the completeness of care patient load (FirstSuppVLProv by year of FirstSuppVLDate) and many were missing. Realized that the care patient load count by provider was only through 2010, so I reran that through the latest year of care data (2013) and recombined facility-level data with the individual-level dataset.

Reviewed provider XY coordinate availability and discovered that about one-third of patients that we'd want to have it (they were diagnosed in 2006-2010 and have a non-missing diagnosing provider) did not have provider XY coordinates. Looked at frequency of diagnosing providers (hars_name) with missing XY and found that numerous major providers (e.g., BELLEVUE, RIKERS ISLAND, BETH ISRAEL) had not been geocoded to XY coordinates. Network analysis does not seem possible without a major geocoding effort for providers.

Added dthdate (patient death date) to list of variables pulled from registry dataset, in order to calculate censor date.

Calculated censor dates, time from diagnosis or suppression to censoring, and whether censoring was due to the outcome of interest (suppression for Aim 1, failure for Aim 2). Censoring variables for Aim 2 are available at VL>400 and VL>1,000.

Completed SAS code to combine individual, neighborhood, and facility-level datasets.

February 5, 2014 – Reviewing variables and population, and adding hboro

SAS

Read in combined indiv/neighb/facility dataset and reviewed most variables with freqs and measures of central tendency. All (individual and neighborhood) look okay so far – need to check provider and outcome variables still.

Added hboro to datasets, to be able to specify the population as persons living in NYC at diagnosed.

April 15, 2014 – Expanding provider characteristics

SAS

Created SAS program to calculate two measures of patient volume: annual diagnoses by provider (for use in aim 1 for facility of diagnosis) and unique patients cared for by provider (for use in aim 2 for facility of first viral suppression), as well as facility type (for aims 1 and 2).

April 17, 2014 – Revising neighborhood variables

SAS

Created additional variable of percent of population that did not graduate from high school for greater consistency with the literature. Previously we had variables for percent finishing high school and percent finishing college. Percent not graduating from high school was calculated as 100 - percent graduating from high school.

Also divided all neighborhood variables by 10 so that, when modelled as continuous variables, the resulting measure of association would represent the hazard ratio for each 10-percentage-point increase in the variable. For example, the percent not graduating high school was 60, but the percent not graduating high school divided by 10 was 6, and the latter variable was modelled, so the hazard ratio for each 1-point change in the latter variable represented a 10-percentage-point change.

May 20, 2014 – Excluding persons with possibly misclassified diagnosis date

SAS

Several edits were made between February 5 and May 21 but not documented here, including the reincorporation of provider XY data since many more had it after a March/April geocoding by Keyi Xu.

On May 20, three exclusions were added to bring the population closely in line with that in Lucia Torian and Qiang Xia's paper on viral suppression among newly diagnosed New Yorkers, which sought to remove persons whose diagnosis dates may have been misclassified. These three exclusions were:

1. Persons who did not have a Western blot within 31 days of diagnosis and were not acute HIV infections
2. Persons who had a detectable (>50 copies/mL) viral load >31 days prior to HIV diagnosis
3. Persons who had a suppressed (>400 copies/mL) viral load ≤31 days following HIV diagnosis

This resulted in a reduction in our analysis population from 14,065 cases to 12,547 cases. Proportion suppressed decreased from 73.8 to 72.8% and median time to suppression increased from 225 to 245 days.

Appendix 4. Calculating shortest distance along NYC streets from patient residence at diagnosis to facility of diagnosis using Network Analyst in ArcGIS

Created XY datasets. We created a single dataset that included variables for patient identifier (cityno), XY coordinates for patient residence at HIV diagnosis, and XY coordinates of the facility that diagnosed HIV in each patient. We transferred this dataset from the most-secure drive to a less-secure drive that has ArcGIS on it. We split this dataset into two, each with the patient identifier and each one having either patient or provider XY coordinates. We copied cityno in each XY Excel file into a second column in each called RouteName. We ensured that patient and provider XY were numeric. We also deleted provider records with missing XY. We named the files "ptxy20140313" and "provxy20140313."

Got Network Analyst. We opened ArcMap and in the Customize menu, selected Extensions – Network Analyst, then closed the window. Then in the Customize menu again, we selected Toolbars – Network Analyst to get the toolbar for this extension.

Obtained network dataset. We obtained the "MP_Network" network dataset of NYC streets. This network dataset is a simple network of NYC streets without details that for our purposes would be extraneous, like which streets are one-way, as we are not interested in actual driving directions. We used Add Data to add MP_Network and specifically NYC_Streets within it, and said "Yes" to also add to the map all feature classes that participate in the network dataset. The Network Analyst toolbar now had in its "Network dataset" window "NYC_Streets_ND." Three layers showed up from this in the Table of Contents: lines, dots for junctions, and lines for edges.

Added XY data to map. We clicked Add Data and added ptxy20140313 and provxy20140313 data from Excel, right-clicked on each to display XY data, and clicked Yes to add the data to the map as a layer (ptxy Events and provxy Events).

Exported XY data to file geodatabase of network dataset. XY data are most easily routed in Network Analyst when saved within the file geodatabase of the network dataset. With the ptxy Events layer, we right clicked, exported data, navigated to the MP_Network geodatabase folder, selected the geodatabase within that, named ptxy as a personal gdb/features class, closed, clicked Yes to add to map as layer, and deleted the original Events layer from the Table of Contents. We did the same with the provxy Events layer. Right-clicked on each to display XY data, and clicked Yes to add to the map as a layer.

Established settings for routing. In the Network Analyst toolbar, clicked the arrow next to "Network Analyst" and selected New Route. In the Table of Contents, immediately under the NYC_Streets layer, we right-clicked on Route → Properties → Analysis settings → Output shape type → Straight line. Routing as a straight line doesn't affect the distance being calculated but may help the routing run faster in ArcMap.

Loaded XY coordinates into Network Analyst. In the Network Analyst window, we right-clicked the Stops line and (after acknowledging with No that we didn't want to repair the address locator) clicked Load Locations, then selected ptxy (the only one with that name in the Table of Contents), selected sorting by Routename, and checked that the Routename property was affiliated with the Routename field in our origins (patient) table. We clicked OK, and this ran in about five minutes We right-clicked Stops,

Load Locations, selected provxy, selected sorting by Routename, and confirmed Routename was affiliated with Routename field in table, clicked OK, and let ArcMap run for another five minutes.

Calculated and reviewed distances. We clicked the Solve icon (a small square with gridlines and a blue line) in the Network Analyst toolbar and let it run for 15-30 minutes this time. This calculated the distances between each person's residence and facility of diagnosis, as well as created straight-line "routes" from each patient to his/her facility of diagnosis. We displayed these on the map, added ZIP and borough shapefiles for context, and exported this map as a PNG image file, not for publication (XY patient locations are confidential) but for internal visual review. We noted that nearly all of Manhattan was completely blanketed by routes, and most of the other boroughs were also largely covered.

Saved dataset of distances. In the Network Analyst window, we right-clicked Routes → Data → Export data → Use the same coordinate system as the data frame → Named it "PtProvDistance" and saved in the main (non-geodatabase) folder, and said Yes to add exported data to map as a layer. Then in Windows Explorer, we opened the DBF that was just created that was affiliated with the shapefile, gave it another name and saved as Excel, kept only cityno and total length (shape length, which was slightly shorter, is the length of the straight-line route drawn between each patient's residence and facility of diagnosis), and created new columns calculating equivalent miles and kilometers from the distance in feet.

Removed data from less-secure drive. We deleted or transferred back to the most-secure drive all files on the less-secure drive related to the calculation of patient-provider distance.

We found the following online resources helpful:

ArcGis Network Analyst tutorial at http://help.arcgis.com/en/arcgisdesktop/10.0/pdf/network-analyst-tutorial.pdf

Post #3 in online forum at http://forums.arcgis.com/threads/30795-calculating-driving-distances

We would like to acknowledge the following persons for their help with network analysis:

Susan Resnick, NYC DOHMH DIIT, for providing network dataset and help with Network Analyst

Andrew Maroko, Lehman College, CUNY, for providing help with Network Analyst, including remotely walking us through the actual routing

Appendix 5. Assessing model fit for Aim 1

An Excel table was made indicating the set of variables in each proportional hazards regression model. The -2LL (with covariates) was recorded from SAS for each model. The difference in -2LL and degrees of freedom were entered into a X^2 calculator at https://www.fourmilab.ch/rpkp/experiments/analysis/chiCalc.html on February 4, 2015. We used the "Calculate probability from X^2 and d" section of the webpage and manually copied each difference in -2LL, out to three significant digits, into the "Given X^2=" box, entered each number of degrees of freedom into the "d=" box, and clicked "Calculate" to get a value in the "The chance probability, Q, is:" box. For example, the model of time from diagnosis to viral suppression that had all three neighborhood-level variables in addition to the seven individual-level variables had a -2LL of about 158,673, whereas the individual-only model's -2LL was about 158,675, for a difference of 2.190 with three degrees of freedom (see Table A5.1). The calculator indicated that the probability of getting a difference at least as large with these degrees of freedom was 0.5339, meaning that the addition of the three neighborhood-level variables did not statistically significantly improve the fit of the model over individual-level variables alone. The model of suppression that had the best fit was that with all individual- and facility-level variables, which had a -2LL of 158,585 (p<0.0001).

Table A5.1. Measures of the fit of proportional hazards models of HIV viral suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012, by individual, facility, and neighborhood characteristics

Variable	Variable type	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Age group (years) at diagnosis	Individual	x	x	x	x	x	x	x	x	x
Sex at birth	Individual	x	x	x	x	x	x	x	x	x
Race/Ethnicity	Individual	x	x	x	x	x	x	x	x	x
Country of birth	Individual	x	x	x	x	x	x	x	x	x
HIV transmission risk	Individual	x	x	x	x	x	x	x	x	x

Year of HIV diagnosis	Individual	x	x	x	x	x	x	x	x	x
Eligible for treatment	Individual	x	x	x	x	x	x	x	x	x
Number of HIV diagnoses made annually by health care facility that diagnosed patient	Facility		x		x					
Type of facility that diagnosed patient	Facility		x			x				
Distance between patient and provider	Facility		x				x			
Percent of population below federal poverty threshold in past 12 months	Neighborhood			x				x		
Unemployment rate among population 16 years and over	Neighborhood			x					x	
Percent of population that is black or African American only (non-Hispanic)	Neighborhood			x						x
Measure of fit: -2LL ("with covariates")		158,675	158,585	158,673	158,642	158,626	158,663	158,673	158,675	158,675
Comparison with model with all individual-level variables, using X^2										
Difference in -2LL		N/A	90.080	2.190	33.230	48.860	11.350	2.070	0.040	0.040
Degrees of freedom		0	3	3	1	1	1	1	1	1
p-value		N/A	<0.0001	0.5339	<0.0001	<0.0001	0.0007	0.1502	0.8414	0.8414

Appendix 6. Patterns of viral load testing

Of 12,547 persons in our analytic sample for Aim 1, i.e., persons newly diagnosed with HIV in 2006-2010 whose address at diagnosis geocoded to an NYC Census tract, 1,446 (11.52%) had no viral load (VL) test between 8 days post-diagnosis and their censor date. Thus, 88.5% (n=11,101) of persons in the analysis had at least one VL test ≥8 days after diagnosis (ranging only narrowly by diagnosis year: 87-90% each year).

Among this group of 11,101 persons, there were a median of 12 (IQR: 7-17) VL tests during follow-up (median of 17 [IQR: 10-23] among those diagnosed in 2006 and median of 8 [IQR: 5-10] among those diagnosed in 2010, for whom follow-up time was shorter), with a median interval of 112 (IQR: 90-164) days (i.e., 3-4 months) between tests (median of 120 days [IQR: 95-182] among those diagnosed in 2006 and median of 101 [IQR: 84-139] among those diagnosed in 2010). Out of the 11,101 persons with at least one VL test ≥8 days after diagnosis, 19% had their first VL test within 14 days of diagnosis (i.e., 8-14 days), 45% within 30 days, 67% within 60 days, 76% within 91 days, 87% within 183 days, 90% within 274 days, and 92% within 365 days.

Appendix 7. Young teenagers, facility type and patient volume, changes in residence over time, and model fit for Aim 2

A7.1. Young teenagers

The discussion argues that information about teenagers is unique because they are rarely included in analyses of viral suppression before 18 years of age. To support this statement, I checked the number of persons in the analysis for Aim 2 who were aged 13-17 years at their first viral suppression after diagnosis. I compared this number with the number of persons 18-19 years old at suppression and calculated the proportion of persons 13-19 years old (i.e., teenagers, one of the age groups in the analysis) who were 13-17. I found that 55 of the teenagers were 13-17 years old, and 141 were 18-19 years old (Table A7.1). Thus, 13-17-year-olds comprised a non-negligible number of persons, and 28% of teenagers, in the analysis. Based on this information, we will keep our argument about teenagers in the Discussion. As an additional note, only 7 of the 13-17-year-olds were 13-15 years old; 48 were 16-17.

Table A7.1. Number of teenagers in analysis, by age group

Age group at first viral suppression	Number of teenagers in analysis	Percentage of teenagers in analysis (%)
13-17*	55	28
*13-15**	*7*	*4*
*16-17**	*48*	*24*
18-19	141	72
Total teenagers (13-19 years old)	**196**	**100**

*These age groups are rarely presented in other analyses of viral suppression.

A7.2. Facility type and patient volume

We found that persons receiving care at facilities with small patient volumes had higher failure rates than those at facilities with larger patient volumes, and that persons receiving care at facilities that were not private physicians' offices had higher failure rates than patients of private physicians, after controlling for individual and other facility or neighborhood characteristics. To prevent confusion in the interpretation of these findings, it would be helpful to know if facility type and patient volume were correlated, e.g., private physicians' offices had smaller patient volumes. To address this issue, I cross-tabulated facility type and patient volume among all 8,927 persons in the Aim 2 analysis population and

conducted a Chi-squared test of association. This analysis shows that, for most persons who were first suppressed at private physicians' offices (850/1,564, 54%), their facilities saw fewer than 1,000 patients for HIV-related medical care that year, whereas for most persons who were first suppressed at an inpatient facility or hospital, their facilities saw at least 1,000 patients (3,865/4,879, 79%; Table A7.2). The Chi-squared test indicated a statistically significant association between facility type and patient volume (p<0.0001). However, facility type and patient volume were not equivalent: most persons who first suppressed at facilities with patient volumes of <250 were *not* at private physicians' offices. The paper was revised so that the proportional hazards models use the combined variable rather than facility type and patient volume separately.

Table A7.2. Number of persons first suppressed at each facility type, by patient volume

Unique patients seen for care (CD4 or VL) at facility of first suppression in year of first suppression		Facility type									
		Inpatient / Hospital		Outpatient: Non-private		Outpatient: Private		Other / Unknown		*Total*	
		N	Col. %	N	Col. %	N	Col. %	N	Col. %	*N*	Col. %
<250		116	2	884	38	850	54	101	54	*1,951*	22
250 to <1,000		898	18	676	29	608	39	85	46	*2,267*	25
1,000 to <2,000		2,020	41	216	9	106	7	0	0	*2,342*	26
>=2,000		1,845	38	522	23	0	0	0	0	*2,367*	27
Total	*N*	*4,879*	100	*2,298*	100	*1,564*	100	*186*	100	*8,927*	100
Total %	*Row %*	*55*		*26*		*18*		*2*		*100*	

A7.3. Changes in residence over time

Residence information from the time of HIV diagnosis was used to provide neighborhood-level data for persons in the analysis. Address of residence was geocoded to the Census tract, which was then used to assign neighborhood poverty level, percent black, and percent unemployed. Complete and accurate geocoding is labor-intensive, so we did not attempt to determine or geocode address at the time of first suppression. Rather, we assumed that the characteristics of a person's Census tract of residence at first suppression were the same as those at diagnosis. To better understand how this might affect the internal validity of our results, we assessed moves among NYC residents 13+ who were diagnosed in

2006-2010 and would go on to achieve suppression ≥31 days after diagnosis and by the end of the follow-up period (12/31/2012). In the October 2013 analytic dataset, this included 12,584 persons, quite a bit more than the dissertation Aim 2 analysis population of 8,927. This may be because of the loss in the dissertation analysis of persons whose address at residence did not geocode, plus other exclusion criteria, which could not readily be included for this appendix analysis.

Among these 12,584 persons, we compared the United Hospital Fund (UHF) neighborhood, borough, and ZIP-level poverty level of their residence at diagnosis with their UHF neighborhood, borough, or ZIP-level poverty level, respectively, as of the end of (a) their diagnosis year and (b) the next calendar year. For example, for someone diagnosed anytime in 2007, we assessed whether the UHF at diagnosis was the same as the UHF as of the end of 2007 and the end of 2008, whether the borough at diagnosis was the same as the borough as of the end of 2007 and the end of 2008, and whether the poverty level of their ZIP code at diagnosis was the same as that of their ZIP code as of the end of 2007 and the end of 2008. We chose these measures because they were readily available and because 44% of persons in the main dissertation analysis for Aim 1 achieved viral suppression within 12 months of diagnosis. The proportion of persons who would have moved by the time they achieved suppression may be estimated by the midpoint of the proportion of persons who moved by the end of *diagnosis year* (for whom median time elapsed would be six months) and the proportion of persons who moved by the end of the *year after diagnosis* (for whom median time elapsed would be 18 months). Residence information in surveillance is updated largely based on laboratory test values; persons achieving suppression by definition would have had laboratory test values subsequent to diagnosis (although not necessarily within one calendar year after diagnosis).

We assessed change in residence overall and by diagnosis year. We found no large differences by diagnosis year in moves across UHFs, boroughs, or poverty levels, so Table A7.3 (below) presents statistics on changes in residence aggregated across diagnosis years. Overall, 16% of persons had changed *UHFs* by the end of their diagnosis year and 27% by the end of the calendar year following their diagnosis, 7% had changed *boroughs* by the end of their diagnosis year and 13% by the end of the calendar year following their diagnosis, and 12% had changed *poverty levels* by the end of their diagnosis

year and 21% by the end of the calendar year following their diagnosis. Midpoints were 21% changing UHF, 10% changing borough, and 16% changing poverty level.

UHFs are larger than Census tracts, suggesting that more than 21% of persons in our analysis may have changed Census tract of residence between diagnosis and suppression. The cross-borough figures are more modest, but those and, to a greater extent, the cross-poverty figures suggest that many persons moved to places substantially different from those they were living in at diagnosis. Similarly, in the dissertation Aim 2 analysis, many persons may have moved by the time they achieved suppression to Census tracts with different characteristics, e.g., poverty level, than the Census tracts they were living in at diagnosis. Additionally, the rate of moving itself (>21%) suggests that the impact of neighborhoods on the achievement of viral suppression may be difficult to measure, as many persons live in more than one neighborhood between diagnosis and suppression, albeit sometimes similar neighborhoods. Our longitudinal analysis, which uses information about residence at one time point only (and moreover, one that falls before the baseline), is somewhat limited in its ability to assess the role of neighborhood on participant outcomes.

Table A7.3. Change in residence among New York City (NYC) residents who were newly diagnosed with HIV in 2006-2010 and achieved viral suppression by the end of 2012

	Timing of the change		
Geographic level	**By end of diagnosis year (%)**	**By end of year after diagnosis (%)**	***Midpoint (%)***
Moved to different UHF neighborhood	16	27	*21*
Moved to different NYC borough	7	13	*10*
Moved to ZIP code with different poverty level	12	21	*16*

*For persons diagnosed in 2007-2010 only, because information about residence at the end of 2006 was not available.

A7.4. Model fit for Aim 2

Table A7.4. Measures of the fit of proportional hazards models of HIV virologic failure after suppression among persons newly diagnosed with HIV in New York City in 2006-2010 and followed through 2012, by individual, facility, and neighborhood characteristics

Variable	Variable type	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Age group (years) at suppression	Individual	x	x	x	x	x	x	x	x
Sex at birth	Individual	x	x	x	x	x	x	x	x
Race/Ethnicity	Individual	x	x	x	x	x	x	x	x
Country of birth	Individual	x	x	x	x	x	x	x	x
HIV transmission risk	Individual	x	x	x	x	x	x	x	x
Year of viral suppression	Individual	x	x	x	x	x	x	x	x
CD4 count	Individual	x	x	x	x	x	x	x	x
Facility type by patient volume	Facility		x		x				
Distance between person and provider	Facility		x			x			
Percent of population below federal poverty threshold in past 12 months	Neighborhood			x			x		
Unemployment rate among population 16 years and over	Neighborhood			x				x	
Percent of population that is black or African American only (non-Hispanic)	Neighborhood			x					x
Measure of fit: -2LL ("with covariates")		64,140	64,069	64,121	64,071	64,136	64,124	64,132	64,137
Comparison with model with all individual-level variables, using X^2									

Difference in -2LL	N/A	70	19	69	4	16	8	2
Degrees of freedom	0	2	3	1	1	1	1	1
p-value	N/A	<0.0001	0.0002	<0.0001	0.0439	0.1502	0.0045	0.8414

Appendix 8. Clarifying and exploring the Aim 3-specific variable of perceived neighborhood social cohesion

A8.1. How the Aim 3-specific variable of perceived neighborhood social cohesion was created

Perceived neighborhood social cohesion was calculated based on the degree of participant agreement with three statements in the Case Surveillance-Based Sampling (CSBS) interview about trust, closeness, and helpfulness between neighbors. [45, 46] These statements were:

a. I live in a close-knit neighborhood.

b. People in my neighborhood can be trusted

c. People in my neighborhood are willing to help each other.

Agreement with each statement were collected using a scored 1-4 Likert scale: strongly agree (1), agree (2), disagree (3), and strongly disagree (4). Scores for the three responses were summed, and these sums of 3-12 were dichotomized near the median, at a natural break that would place approximately equivalent numbers of persons in each category.[46] Specifically, the majority of sums were 6, 9, or 12 (>20% each), and 48% of persons had sums of 3-8 (see Table A8.1). Lower scores indicated agreement with positive statements about the neighborhood; perceived neighborhood social cohesion was classified as high for persons with sums of 3-8 (48% of the sample population) and low for persons with sums of 9-12 (52% of the sample population; see Table A8.2).

Table A8.1. Sums of responses to three cohesion-related questions in Case Surveillance-Based Sampling interview, among 92 persons in analysis of viral suppression among newly diagnosed New York City residents

cohesionOrig: Sum of three cohesion variables				
cohesionOrig	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
3	2	2.17	2	2.17
5	3	3.26	5	5.43
6	22	23.91	27	29.35
7	8	8.70	35	38.04

cohesionOrig: Sum of three cohesion variables				
cohesionOrig	Frequency	Percent	Cumulative Frequency	Cumulative Percent
8	9	9.78	44	47.83
9	22	23.91	66	71.74
10	3	3.26	69	75.00
11	4	4.35	73	79.35
12	19	20.65	92	100.00

Table A8.2. Dichotomized cohesion measure based on responses to three cohesion-related questions in Case Surveillance-Based Sampling interview, among 92 persons in analysis of viral suppression among newly diagnosed New York City residents

LowCohesion: Poor neighborhood social cohesion (cohesionOrig score is high: 9-12)				
LowCohesion	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	44	47.83	44	47.83
1	48	52.17	92	100.00

A8.2 Cohesion as a three-level variable

Perceived neighborhood social cohesion could have been categorized in a way that reflected the distribution of values differently. Because most persons in our sample had cohesion scores of exactly 6, 9, or 12, we constructed an alternative version of the cohesion variable with three levels rather than two. For this, cohesion was classified as low if the sum of the three cohesion variables was 10-12, medium if 7-9, and high if 3-6. Approximately equal proportions of the sample population were in each group.

We ran a multivariable proportional hazards regression with this alternative version of the cohesion variable (see Table A8.3). As with the original version of the variable, we found that increasing levels of cohesion were associated with reduced hazards of suppression, and that this association was still not statistically significant.

Table A8.3. Proportional hazards regressions of HIV viral suppression among a stratified random sample of persons newly diagnosed with HIV in New York City in 2006-2012 who were interviewed and followed through June 2014, including perceived neighborhood social cohesion as a three-level variable

	AHR[1] (95% CI)
Perceived neighborhood social cohesion	
Low cohesion	1.00
Medium cohesion	0.73 (0.42-1.28)
High cohesion	0.69 (0.34-1.43)
Age group (years) at diagnosis	
13 - 29	0.62 (0.35-1.08)
≥30	1.00
Sex at birth	
Male	0.93 (0.53-1.61)
Female	1.00
Race/Ethnicity	
Black or Hispanic	0.43 (0.21-0.85)
Another race/ethnicity	1.00
Year of HIV diagnosis	
2009 - 2009	0.60 (0.35-1.03)
2010 - 2012	1.00
Eligible for treatment	
Yes	1.00
No	0.60 (0.36-0.99)
Percent of population below federal poverty threshold in past 12 months	
Low or medium (<20%)	1.00
High or very high (≥20%)	1.00 (0.98-1.03)

[1] AHR: Adjusted hazard ratio

Appendix 9. The creation of the Aim 3-specific variable for individual-level poverty, i.e., estimated poverty status

Aim 3 was limited to persons interviewed by the Case Surveillance-Based Sampling project, which, unlike routine HIV surveillance in NYC, asked participants' household size and income. This provided a unique opportunity to assess poverty at the household/individual level. (Both CSBS and routine HIV surveillance collect information about the place of residence of New Yorkers with HIV and can use residence data in combination with US Census Bureau data to assess neighborhood-level poverty.) In short, we combined US Census statistics on poverty thresholds by family size with self-reported household income from CSBS and number of persons who depended on the income (which we treated as a proxy for family size), to create a variable dichotomizing each person as poor or non-poor. We called this measure "Estimated poverty status," and this appendix provides more details about its creation.

The relevant CSBS variables to create this poverty measure are described in the CSBS protocol's Appendix D1, "2012/2013 Case-Surveillance-Based-Sampling Questionnaire for The Medical Monitoring Project (MMP)" (see Figure A9.1). Monthly or yearly income was collected only as a range of values, not a specific dollar amount.

Figure A9.1. Questionnaire extract for income-related questions

SAY: "Please take a look at **Response Card A** and tell me the letter that corresponds to either your monthly or yearly household income before taxes."

Monthly Income *[MTH_IN12]*		**Yearly Income** *[YR_IN12]*	
a.	$0 to $416	j.	$0 to $4,999
b.	$417 to $833	k.	$5,000 to $9,999
c.	$834 to $1249	l.	$10,000 to $14,999
d.	$1250 to $1666	m.	$15,000 to $19,999
e.	$1667 to $2499	n.	$20,000 to $29,999
f.	$2500 to $3333	o.	$30,000 to $39,999
g.	$3334 to $4166	p.	$40,000 to $49,999
h.	$4167 to $6249	q.	$50,000 to $74,999
i.	$6250 or more	r.	$75,000 or more
77	Refused to answer	77	Refused to answer
88	Don't know	88	Don't know

D14a. Including you, how many people depended on this income in **2011** (2012)? *[DEPND_IN]*

___ ___ *[77 = Refused to answer, 88 = Don't know]*

CSBS participants were asked to use a response card to indicate either their monthly or yearly income (see Figure A9.2).

Figure A9.2. Participant response card for monthly and yearly income questions

RESPONSE CARD A

	Monthly Income		Yearly Income
a.	$0 to $416	j.	$0 to $4,999
b.	$417 to $833	k.	$5,000 to $9,999
c.	$834 to $1249	l.	$10,000 to $14,999
d.	$1250 to $1666	m.	$15,000 to $19,999
e.	$1667 to $2499	n.	$20,000 to $29,999
f.	$2500 to $3333	o.	$30,000 to $39,999
g.	$3334 to $4166	p.	$40,000 to $49,999
h.	$4167 to $6249	q.	$50,000 to $74,999
i.	$6250 or more	r.	$75,000 or more

Variables for monthly and yearly income had corresponding values, such that the lowest category of monthly income response would be equivalent to the lowest category of yearly income response, were that monthly income earned for 12 months (see Table A9.1). For example, persons in households earning up to $4,999 in a year would earn $4,999/12 = $416/month, and either response was coded as a "1."

Table A9.1. Codebook of CSBS participant responses for monthly and yearly income and number of persons depending on the income

MTH_IN12	8	Monthly combined household income^[MTH_IN12]	1	(1)a. $0 to $416
			2	(2)b. $417 to $833
			3	(3)c. $834 to $1249
			4	(4)d. $1250 to $1666
			5	(5)e. $1667 to $2499

			6	(6)f. $2500 to $3333
			7	(7)g. $3334 to $4166
			8	(8)h. $4167 to $6249
			9	(9)i. $6250 or more
			D	(D)Don't Know
			S	Skipped
YR_IN12	8	Yearly combined household income^[YR_IN12]	1	(1)j. $0 to $4,999
			2	(2)k. $5,000 to $9,999
			3	(3)l. $10,000 to $14,999
			4	(4)m. $15,000 to $19,999
			5	(5)n. $20,000 to $29,999
			6	(6)o. $30,000 to $39,999
			7	(7)p. $40,000 to $49,999
			8	(8)q. $50,000 to $74,999
			9	(9)r. $75,000 or more
			D	(D)Don't Know
			S	Skipped
DEPND_IN	8	How many people depended on this income^[DEPND_IN]	Nonmissing	Numeric value
			.S	(S)Skipped
			.	Missing

Because monthly and yearly income variables were coded in parallel fashion, because participants typically responded to only one of those variables, and to be conservative about who was counted as poor, we created a variable for income category that took the larger value of either monthly or yearly income.

We obtained a table of US poverty cutoffs from the Census Bureau based on family size (see Table A9.2).

Table A9.2. Poverty Thresholds for 2013 by Size of Family and Number of Related Children Under 18 Years

Size of family unit	Weighted average thresholds	Related children under 18 years								
		None	One	Two	Three	Four	Five	Six	Seven	Eight or more
One person (unrelated individual).....	11,888									
Under 65 years.....	12,119	12,119								
65 years and over.....	11,173	11,173								
Two people.....	15,142									
Householder under 65 years.....	15,679	15,600	16,057							
Householder 65 years and over.....	14,095	14,081	15,996							
Three people.....	18,552	18,222	18,751	18,769						
Four people.....	23,834	24,028	24,421	23,624	23,707					
Five people.....	28,265	28,977	29,398	28,498	27,801	27,376				
Six people.....	31,925	33,329	33,461	32,771	32,110	31,128	30,545			
Seven people.....	36,384	38,349	38,588	37,763	37,187	36,115	34,865	33,493		
Eight people.....	40,484	42,890	43,269	42,490	41,807	40,839	39,610	38,331	38,006	
Nine people or more.....	48,065	51,594	51,844	51,154	50,575	49,625	48,317	47,134	46,842	45,037

Source: U.S. Census Bureau.

We used the weighted average thresholds from this table as income cutoffs. However, these did not correspond perfectly with CSBS income categories. We created an approximate crosswalk of Census thresholds and CSBS yearly household income (see Table A9.3). Persons with a CSBS income category that was at or below the cutoff category were classified as poor. We again erred on the side of being conservative, i.e., not classifying a family as poor if most of the values in an income range were above the poverty threshold for that family size. For example, for one-person families, the poverty threshold was $11,888, and we linked this with CSBS income category 2. This meant that any CSBS participant reporting CSBS income categories 1 or 2 (i.e., yearly income below $9,999) and stating that only one person was dependent on this income would be classified as poor. CSBS participants reporting CSBS income category 3 (i.e., yearly income of $10,000-$14,999) with one person dependent on this income would be classified as non-poor, even though some of those persons may have had incomes between $10,000 and $11,888.

Table A9.3. Approximate crosswalk of Census poverty thresholds and CSBS yearly household income, by family size

Size of family unit	Weighted average thresholds (dollars)	Highest CSBS income category beneath the threshold (approx)
1	11,888	2
2	15,142	3
3	18,552	4
4	23,834	4
5	28,265	5

6	31,925	5
7	36,384	6
8	40,484	6
9	48,065	7

This process permitted us to assign an estimated poverty status, i.e., an individual-level poverty measure, to each CSBS participant who answered interview questions about monthly or yearly household income and number of persons who depended on this income. Persons missing any of this information were excluded from our analyses.

Table A10.1. Measures of the fit of proportional hazards models of HIV viral suppression among a stratified random sample of persons newly diagnosed with HIV in New York City in 2006-2012 who were interviewed and followed through June 2014, by individual and neighborhood characteristics

Appendix 10. Assessing model fit for Aim 3

Variable	Variable type	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Perceived neighborhood social cohesion	Individual							x		x	x		x		x		x
Age group (years) at diagnosis	Individual	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sex at birth	Individual		x				x				x	x	x	x	x	x	x
Race/Ethnicity	Individual	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Country of birth	Individual													x	x	x	x
HIV transmission risk	Individual													x	x	x	x
Year of HIV diagnosis	Individual			x		x	x	x	x	x	x	x	x	x	x	x	x
Eligible for treatment	Individual				x	x	x	x	x	x	x	x	x	x	x	x	x
Estimated poverty status	Individual													x	x	x	x
Percent of population below federal poverty threshold in past 12 months	Neighborhood								x	x		x	x			x	x
Measure of fit: -2LL ("with covariates")		631	631	623	621	618	618	617	618	617	617	618	617	614	614	614	614
Comparison with other model specified, using X^2			Comparison with Model 1	Comparison with Model 1	Comparison with Model 1	Comparison with Model 4	Comparison with Model 5	Comparison with Model 5	Comparison with Model 5	Comparison with Model 5	Comparison with Model 6	Comparison with Model 6	Comparison with Model 11	Comparison with Model 5	Comparison with Model 13	Comparison with Model 13	Comparison with Model 13
Difference in -2LL		N/A	0.553	8.133	10.119	2.912	0.031	0.996	0.084	1.007	0.995	0.086	0.921	4.039	0.576	0.030	0.659
Degrees of		0	1	1	1	1	1	1	1	2	1	1	1	4	1	1	2

freedom																
p-value	N/A	0.457	0.0043	0.0014	0.0879	0.8602	0.3182	0.7719	0.6044	0.3185	0.7693	0.3372	0.4007	0.4478	0.8624	0.7192

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Autobiographical Statement

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Investigation of the Effects of Graphic Cigarette Warning Labels on Youth and Adult Smoking Behavior in Southeast Asia

by

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This manuscript has been read and accepted for the Graduate Faculty in Public Health in satisfaction of the dissertation requirement for the degree of Doctor of Public Health.

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Abstract

Investigation of the Effects of Graphic Cigarette Warning Labels on Youth and Adult Smoking Behavior in Southeast Asia by

Adviser: Professor William T. Gallo, PhD

The objective of this dissertation was to investigate the impact of graphic cigarette warning label policies enacted in Thailand and Malaysia on youth and adult smoking outcomes. We sought to examine the effect of the policy on youth smoking intention, susceptibility, and behaviors. Among adults, who were all baseline smokers, we sought to examine the effects of graphic warning labels on smoking intensity, quit attempts, and cessation. Secondary data were utilized from the International Tobacco Control (ITC) South East Asia (SEA) Survey, a nationally representative cohort survey for which eight years of data spanning from 2005 to 2012 were available. Multiple wave-pairs of data were analyzed concurrently using generalized estimating equations (GEEs) with the predictors measured at a baseline wave (wave t) predicting outcomes measured at the next wave, the outcome wave (wave t + 1). Thus, it was possible for participants to provide data for multiple wave-pairs which increased the power of the study.

We analyzed our data using two approaches. In our first approach, we utilized a quasi-experimental design capturing the time period after which Thailand had enacted the policy, but prior to policy implementation in Malaysia. Using this approach, outcomes were assessed for our Thai sample using the Malaysian sample as a control, whereby country differences reflected the effects of the graphic warning label policy. In our second approach, we limited the data to the post-policy implementation period in both countries to assess the effect of frequency of exposure to graphic warning labels on smoking outcomes among youth and adults. We employed measures of risk cognition and label salience as proxies for frequency of exposure, due to the potential collinearity between smoking status and exposure to warning labels which may have contaminated our analyses of smoking outcomes.

This study found that graphic cigarette warning labels significantly reduced future smoking intention among Thai male youth smokers, as well as increased the odds of intending to quit smoking within 6 months. Among female never-smokers, the policy decreased intention to smoke. We also found high cognition of risk to be significantly associated with decreased susceptibility to smoking, decreased odds of smoking initiation, and reduced smoking intensity among male youth.

Among adult smokers, our findings indicate that *any* label salience was associated with increased odds of attributing quit status to warning labels among male smokers in Thailand and all adult smokers in Thailand (versus *no* salience). *High label* salience was associated with increased odds of making a quit attempt among male smokers in Thailand, all smokers in Thailand, and male smokers in Thailand and Malaysia (versus *low* salience); and increased odds of attributing quit status to warning labels among male smokers in Thailand and all adult smokers in Thailand (versus *low* salience). A secondary goal of our research was to explore purchasing loose cigarettes, or loosies, as an effect modifier of the association between label salience and smoking outcomes. The investigation of loosies is imperative, as some researchers have raised concerns that smokers will employ avoidance tactics such as covering cigarette packs or purchasing loosies to avoid graphic labels. Our findings indicate that loosies are actually associated with *positive* smoking outcomes: among smokers reporting any label salience, we found reduced odds of high intensity smoking among smokers in Thailand and Malaysia who purchased loosies (versus those who did not purchase loosies). Among respondents who reported high salience, we found reduced odds of high intensity smoking among smokers in Thailand and Malaysia who purchased loosies (versus those who did not purchase loosies).

In conclusion, the findings of this study support the effectiveness of graphic cigarette warning labels in reducing intention to smoke and smoking behaviors among youth and adults in Southeast Asia. If current trends persist, tobacco will kill more than 8 million people worldwide annually by the year 2030, with 80 percent of these deaths in low- and middle-income countries. It is imperative that we continue to support the implementation of cost-effective public health policies to reverse these trends and reduce smoking-related morbidity and mortality.

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Of all the components of this dissertation, I find myself struggling most with the acknowledgements. It is nearly impossible to find the words to express the extent of my gratitude for my family, friends, and mentors.

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To my father – my "Superman." Your battle with emphysema will not be in vain. Watching how hard you fight on a daily basis has inspired my commitment to conducting research on tobacco control policies in the hopes of preventing others from battling smoking-related disease. You can also take full credit for my love of math and statistics – because I certainly didn't get that from mom! You're so much more than "just a kid from Brooklyn" – you are my motivation, my inspiration, and my muse. Thank you for always being in my corner.

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To my committee, *collectively* – thank you for bearing with my long, frantic emails – and for your advice, feedback, and guidance especially as I entered the final throes of dissertation completion. I will carry the integrity and wisdom you have imparted to me throughout my career as a public health scientist. It was a supreme honor and the highest of privileges to collaborate with each and every one of you.

Finally, I must thank the International Tobacco Control (ITC) Project Team, NAMES REDACTED, for taking the time to meet with me and for granting me access to the ITC South East Asia survey. It is only through the use of this incredible dataset that I have been able to answer the research questions I have had since I first learned about graphic cigarette warning labels.

Ultimately, I hope the knowledge gained from this dissertation will support efforts to curb smoking among adult smokers and prevent youth from ever picking up their first cigarette. As public health researchers, we must direct our attention to developing countries and vulnerable sub-populations which

have not experienced the same decrease in smoking as the Western world. The graphic warning labels on cigarette packs accurately portray the side effects of smoking, but they will never be able to truly capture the horrors of living with a smoking-related illness. Let us work to prevent the next generation from ever having to experience these horrors firsthand.

This one’s for you, dad.

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Chapter 1. Introduction

1.1. Background and Significance

Despite progress in reducing prevalence of daily smoking over the past few decades, the number of smokers has increased steadily worldwide, and there are preliminary indications that global prevalence among men has increased in recent years [1]. Seventy percent of the world's 1.1 billion smokers are in developing countries, with over 50% in Asia alone [2]. The health and economic burden of tobacco use is rapidly shifting from high to low and middle income countries. Asia is an especially important region for global tobacco control given its large population and the trajectory of smoking rates in the region. If current smoking trends continue, tobacco use could cause approximately 8.3 million deaths annually by the year 2030, with more than 80% of deaths occurring in low- and middle-income countries (LMICs) [3], where nearly two-thirds of the world's smokers live [4]. The Southeast Asia region is home to nearly 400 million tobacco users, who experience about 1.2 million deaths annually [5]. Prevalence of smoking among men is especially high, in terms of proportion and absolute numbers [6]. Although women commonly use smokeless tobacco, the rising trend in smoking among women is causing grave concern among governments in the region [6]. Tobacco use among youth is quite high due to the tobacco industry's creative and targeted marketing strategies and its weak regulation [6]. Other key factors contributing to the tobacco epidemic in the region are abundant tobacco production, weak enforcement of tobacco control measures, and easy accessibility and affordability of tobacco products [6, 7].

Two Asian countries, Thailand and Malaysia, demonstrate different stages of tobacco control in this critical region. For more than a decade, Thailand has served as a model for tobacco control in Asia. In 1999, Thailand was one of the only Asian countries to experience a decline in smoking rates over the previous decade. It was one of the first countries to introduce comprehensive policies, including graphic (or pictorial) warning labels on cigarette packages which were implemented in March 2005. Despite progress, smoking rates remain high with 24% of Thai adults classified as smokers in 2011. Dramatic gender disparities exist among smokers with approximately 46.6% of Thai adult men reporting being daily smokers, as opposed to only 2.6% of Thai women [8]. Smoking rates also differ among rural and urban

populations; males who live in rural areas are more likely to smoke, whereas females living in urban areas are more likely to smoke [2].

Until recently, Malaysia had few comprehensive tobacco control policies and remained a tobaccofriendly country. In 2011, 23.1% Malaysian adults aged 15 years or older were current smokers. As in Thailand, there are dramatic differences in smoking rates between genders with approximately 43.9% of men reporting smoking, compared to only 1% of women. However, in recent years, Malaysia has made significant strides in tobacco control policy. New legislation was introduced in 2004 which restricted advertising and promotion, established smoke-free environments, and included measures to restrict access to minors. In January 2009, graphic warning labels on cigarettes replaced text-only warnings.

1.1.1. Graphic Cigarette Warning Label Policies in Thailand and Malaysia

In March 2005, Thailand became the fourth country in the world after Canada, Brazil, and Singapore to print graphic health warning labels on tobacco products. The original policy required six rotating graphics to cover 50% of the front and back of cigarette packages. In March 2006, nine new graphic warnings were put in place. In March 2010, Thailand updated the policy once again to require a new set of ten health warning images to cover 55% of the front and back of cigarette packages. These new labels contained quitline data for smokers trying to quit. In January 2012, a set of 10 different labels on the hazards and constituents were introduced. The new labels occupied 60% of each side of cigarette packs. In September 2013, the policy was updated once more to require graphic warning labels covering 85% of the front and back of cigarette packs, making Thailand's labels the largest in the world. New warning requirements for cigarettes were set to enter into force in October 2013, but tobacco companies were granted a request for a temporary suspension of the rules pending a final decision by the court on the merits of the case.

Thailand also prohibits the terms "light" and "mild" from appearing on packages, as they are considered misleading words that might cause consumers to believe that certain tobacco products are less dangerous than others or that may encourage consumption. In June 2011, Thailand released an

amendment of previous regulations banning the use of a list of misleading terms. Regulations now include a ban of words or terms which convey attractiveness such as "cool," "ice," "frost," "crisp," "fresh," "mint," "mellow," "rich," "smooth," "natural," "special," "genuine,", "luminous," "extra," "premium," and other terms with similar meaning.

On January 1, 2009, Malaysia became the fourth country in the Association of Southeast Asian Nations (ASEAN) region to implement pictorial health warnings after Singapore (2004), Thailand (2005), and Brunei (2008) [9]. Six rotating pictorial health warnings cover 40% of the front and 60% of the back of cigarette packs. Just as in Thailand, misleading descriptors on cigarette packs are also banned. Cigarette packs are also required to contain an advisory against selling to minors, and a quitline phone number for smokers interested in quitting. The six rotating graphics were adopted from labels required in Singapore and Thailand (three from each country). Warnings are printed in both Malay and English on each side of the pack, and are required to rotate every two years.

In February 2004, five years prior to the implementation of graphic cigarette labels, the “Tak Nak” (“Say No”) Campaign was launched by the Prime Minister of Malaysia in order to reduce the prevalence of smoking and smoking related morbidity and mortality. The campaign’s slogan “Every puff you take damages your body” was aimed at discouraging teenagers and women from starting to smoke, smokers from continuing to smoke, and friends and families to support activities to curb tobacco smoking. The campaign ran until 2011. Information and attitude/belief-change efforts were communicated through multiple media channels including television, newspapers, magazines, radio, cinema billboards, and through collateral items such as t-shirts.

1.1.2. Effectiveness of Graphic Cigarette Warning Labels

Previous research has suggested that the greater impact of graphic warning labels compared to text-only warnings is consistent across diverse racial/ethnic and socioeconomic populations. Given their great reach, graphic warning labels may be one of the few tobacco control policies that have the potential to reduce communication inequalities across groups. Policies that establish strong graphic warning labels

on tobacco packaging may be instrumental in reducing the toll of the tobacco epidemic, particularly within vulnerable communities [10].

Data from the International Tobacco Control (ITC) Policy Evaluation Project, a prospective longitudinal panel study of smokers in multiple countries [11, 12], demonstrate that graphic warnings are more likely to be noticed than text-only warnings [13-16], more effective in informing viewers of the risks of smoking [15, 17], and more likely to motivate quit-related activity [14, 18-20]. Experimental work is limited, but evidence suggests that graphic warnings outperform text-only warnings on a range of outcomes, including capturing attention [21], increasing awareness of health risks [22], and creating unfavorable associations with smoking [23], as well as perceived effectiveness [24, 25], negative affect [26], and motivation to quit [10, 22, 26, 27].

Other researchers point to shortcomings of the existing empirical evidence and are less convinced that graphic warning labels are effective in their intent to promote cessation. Ruiter and Kok [28, 29] argued that the evidence is sparse and unconvincing, and find flaws in the current research such as poor controls for mediating variables. They point out the lack of longitudinal evidence comparing attitudes toward smoking and smoking trends prior to and following the implementation of graphic labels in a specific population. Furthermore, there is some evidence that graphic warnings incite defensiveness in response to fear-arousing information [28, 30, 31]. Problems may arise when the fear induces a more pressing concern while curbing the immediate experience of fear, often by attempting to undermine the importance or credibility of the message. Self-affirmation theory [32] states that people are fundamentally motivated to protect their sense of self-integrity. This is the motive that is most aroused by threatening material, such as graphic warnings, and is satisfied by defensiveness [33].

Whether graphics or text-only warnings are implemented, message framing is central to the effectiveness of labels. According to the Prospect Theory [11], when people focus on potential gains they are not motivated to take risks or face uncertainty. Rather, they choose a definite gain over a potentially uncertain gain. However, when focusing on a loss, people are more likely to accept risk and uncertainty when the risk includes the possibility of avoiding a loss [34]. Loss-framed messages emphasize the

negative consequences of a behavior while gain-framed messages emphasize how one can avoid the undesirable outcome. The difference between gain framed avoidance and gain framed benefits is that the former emphasizes the threat one can avoid by not smoking while the latter emphasizes the pure benefits of not smoking [35]. Graphic cigarette labels have been criticized for being loss-framed, and have raised concerns of the incitation of avoidance tactics, such as covering cigarette packs or purchasing loose cigarettes, and possibly lead to other adverse effects [36].

Some research has suggested that warning labels would be more effective if they created a strong positive attitude toward quitting, while concurrently promoting a negative attitude towards smoking. An example of a message which promotes positive attitudes towards quitting is: “Quitting smoking reduces your chance of having a heart attack” or, “If you smoke two packs a day, quitting will save you *X* dollars in the next year” [37]. Furthermore, messages may only be relevant to specific segments of the population, e.g., adolescents and teenagers, current smokers, pregnant women, etc. The dissemination of information targeting specific subgroups has been shown to be more effective than generic messages [38].

With regard to process principles, color and brightness are one way to draw attention to warning labels; these tactics are also utilized by tobacco companies as a marketing technique. Bright colors tend to attract attention and prompt smokers to consider the content of the message. Bansal-Travels et al. [39] conducted a study to examine the potential impact of pack design on risk perception and brand appeal. Results showed that participants selected larger, graphic, and loss-framed warning labels as more likely to attract attention, encourage thoughts about health risks, motivate quitting, and be most effective. Participants were more likely to select packs with lighter color shading and descriptors such as light, silver, and smooth as delivering less tar, smoother taste, and lower health risk, compared to darkershaded or full-flavor packs.

Another issue, overexposure or wear-out, is a problem for any message that is presented repeatedly over time. A message’s effectiveness tends to increase over the first few exposures, but then diminishes over time [40]. Studies have found that people exposed to newly designed warnings are

significantly more likely to retain the message or concept of the newer warning label as compared with older labels [41]. A survey conducted in Canada in 1999 revealed that 65% of adult smokers and 74% of youth smokers agreed that the warning labels that were introduced in 1994 were "worn-out and had lost their effectiveness" [42]. Other studies found that individuals exposed to newly designed warnings were significantly more likely to remember the concept of the warnings than individuals exposed to old mandated warnings [43, 44]. Research has suggested that a variety of anti-smoking messages would be effective, and such a strategy would also address this over-exposure problem [37].

1.2 Overview of the dissertation

1.2.1. Innovation

Previous research on the impact of graphic cigarette warning labels has focused primarily on the adult response, particularly in Westernized countries such as Canada and Australia. Limited studies have investigated the impact on youth, and those that have investigated the youth response have primarily utilized cross-sectional designs, or were published before multiple waves of data became available. The longitudinal nature of the data that we utilize, as well as the analysis of multiple wave-pairs of repeatedmeasure data, strengthens the potential causal implications of findings and allows us to stratify by subgroups such as country, sex, and smoking status. The use of generalized estimating equations [45] to estimate our models accounts for the intra-subject correlation of responses over time and allows us to generate population-averaged (marginal) effects of graphic cigarette warning labels on smoking outcomes. This research builds upon prior research by examining the impact of the graphic warning label policy on youth and adult smoking *behaviors,* in addition to smoking *intentions*. Additionally, we examine the effects of graphic warning labels on different sub-classifications of smokers, including non- and neversmokers, who are just as likely, if not more so, to be confronted with warning labels as ad campaigns during a smoking decision scenario [46]. Furthermore, our models of youth and adult smoking are theory-driven, and include variables such as normative beliefs, self-efficacy (or perceived behavioral control), label saliency, peer and parental smoking, and societal influence (normative beliefs). We also explore varied measures of label salience and risk cognition after the implementation of graphic warning labels.

Lastly, to our knowledge, this is the first study to explore the moderating effects of purchasing loose cigarettes on smoking outcomes, as this may reduce exposure to the warning labels on cigarette packs.

1.2.2 Conceptual/Theoretical Framework

The underpinnings of behavior, or key predictors, and how to influence those predictors are integral to the discussion of public health message campaigns such as graphic cigarette warning labels.

Central to the design of graphic health warnings on cigarette packets is the intention to influence behavior by influencing its pre-cursers such as knowledge, attitudes, and beliefs. In order to conceptualize the mechanism through which graphic warning labels are effective, theoretical constructs from social psychology, social marketing, and health econometrics have been explored. The Health Belief Model (HBM) suggests that a person's decision to take a health action is influenced by her beliefs and perceptions [47]. Central to applying the Health Belief Model to this analysis is understanding the perceived threat of disease associated with smoking. Perceived threat is composed of both the perceived susceptibility to and seriousness of disease caused by certain actions. Related to the Health Belief Model is McGuire's Chain of Persuasion [48] which suggests that for a message to actually influence behavior, it must involve a sequence of cognitive responses: first a person must be exposed to the message; they must receive or attend to the message; they must comprehend the message; they must be persuaded by the message (yield to it); they must retain the message; they must retrieve it in relevant situations; they must decide to act; and, finally, act in accordance with the message itself. The Health Belief Model, as well as McGuire's Chain of Persuasion, emphasizes cognition, and the weighing up of opposing cognitions, in predicting health behavior. This model assumes that attitudes and behaviors are influenced by: a person's belief that they are susceptible to health consequences related to a behavior; a personal appraisal that those health consequences are serious; the person's perception that the behavior has more costs than benefits; and that there is some "cue to action" or precipitating force changing the current (implicitly balanced) state. However, a systematic review in 1992 found that the HBM lacked predictive power, probably due to its lack of scope in discussing other predisposing and enabling factors. The model was found to lack the predictive power of newer cognitive models. Two specific constructs missing from

the model have become seminal in social cognitive theories and the study of health behavior change: efficacy beliefs and social norms.

Many behaviors, such as quitting smoking, are complex and require considerable motivation and skill. People's appraisal of their own capabilities, or self-efficacy, and the control they have over outcomes are held to be important. Albert Bandura's Social Cognitive Theory [49] argues that people's self-efficacy or belief in their ability to control an outcome, mediates their behavior. Self-efficacy is an important construct in the context of trying to promote quitting smoking as it is related to whether or not an individual will undertake particular goal-directed activities, the amount of energy that the individual will put into that effort, and the length of time that the individual will persist in striving to achieve a particular goal.

The construct of social norms refers to the conscious and unconscious conformity in peoples' everyday lives. It has been recognized by both social psychology and marketing theory that social conformity, or the tendency to want to be like relevant and significant others, is a fundamental component of human behavior. Social norms may have a direct impact on intentions which, in turn, may lead to a change in behavior. Within social norms, a subjective norm is a person's belief that most of their important others (i.e., peers, friends, etc.) think he or she should, or should not, perform the behavior in question. The individual takes into account the normative expectations and perceived support of others in their environment. Overall, it has been demonstrated that people are more likely to intend to perform a behavior, when they believe that other people who are important to them think it should be performed [50]. Incorporating social norms as a predictor of behavior change, the Theory of Reasoned Action [51] proposed that behavioral intention is determined by a weighted function of that individual's: (i) attitude towards performing that behavior **+** (ii) perceived subjective norms, or perceived social pressure to perform the behavior.

The Theory of Reasoned Action recognizes people as rational decision makers who make systematic use of the information available to them. Actions are largely seen to be made by choice and under an individual's control; additionally, a person's volitional behavior is held to be predicted directly by

an individual's intention to take action. The Theory of Planned Behavior [52] extended the Theory of Reasoned Action by incorporating self-efficacy or perceived behavioral control as a direct influence on intention and behavior. Perceived behavioral control is the extent to which the individual believes that taking the action will be hard or difficult. Most behaviors require skills, resources and cooperation of others to facilitate the behavior change, hence the addition to the model of (iii) perceived control over the behavior or self-efficacy.

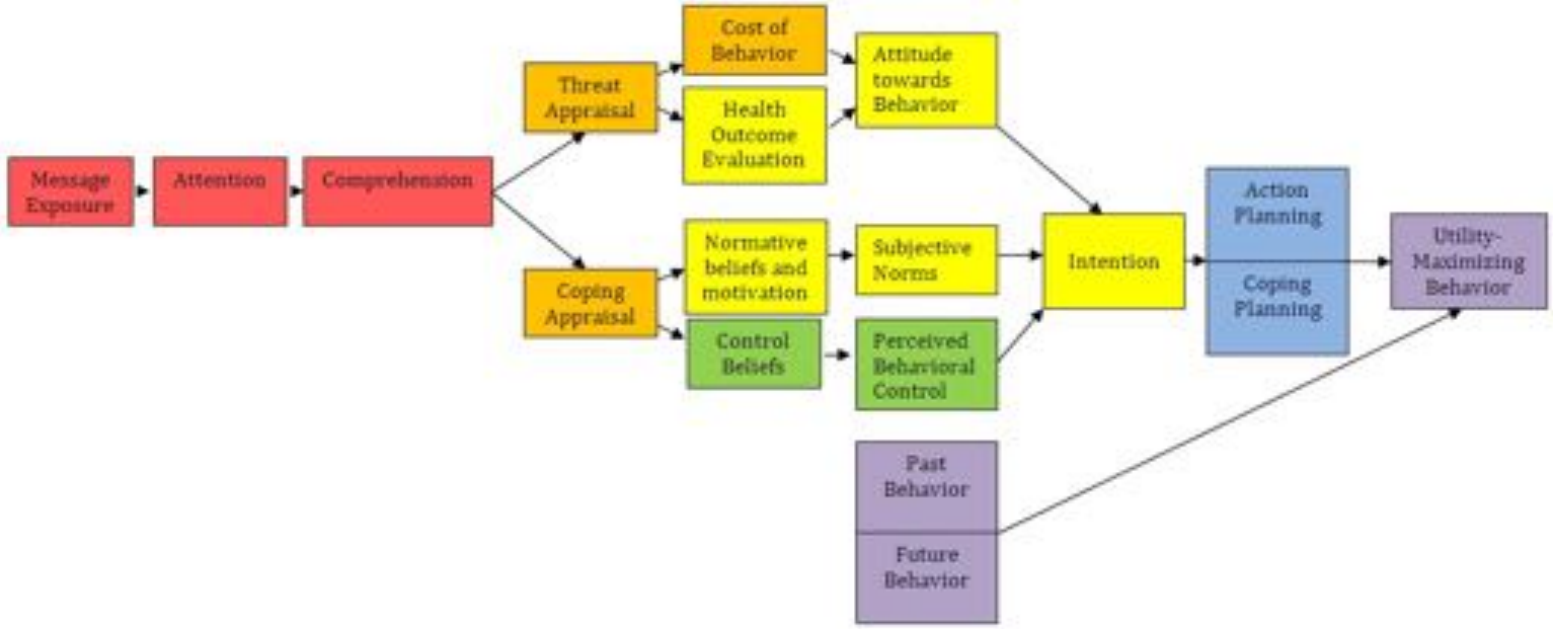
Taking the Theories of Reasoned Action and Planned Behavior one step further, the Health Action Process Approach specifies a relationship between level of motivation to quit and degree of risk perceptions [53]. It proposes that there is a distinction between the pre-intentional motivation process (including risk perceptions) that leads to intention to make a behavior change and the post-intentional volition process that leads to the actual behavior change [53]. The volition process can be further subdivided into a planning phase, action phase, and maintenance phase. When applied to smoking cessation, the Health Action Process Approach predicts that those who do not intend to quit (nonintenders) should have lower risk perceptions than those who do intend to quit (intenders) [54].

The effectiveness of warning labels is thought to be determined, at least in part, by the graphicness of their design and content of their messages. While intended to communicate the risks of smoking, the labels may also evoke a fear response from smokers. The Protection Motivation Theory was developed to better understand fear appeals and how people cope with them. It proposes that we protect ourselves based on four factors: (i) perceived severity of a threatening event; (ii) perceived probability of the occurrence, or vulnerability; (iii) efficacy of the recommended preventive behavior; and (iv) perceived self-efficacy. Protection motivation incorporates both threat appraisal and the coping appraisal. Threat Appraisal consists of both the severity and vulnerability of situation; severity refers to the degree of harm from the unhealthy behavior, while vulnerability is the probability that one will experience harm. Additionally, rewards refer to the positive aspects of continuing the unhealthy behavior. The total threat represents the sum of severity and vulnerability, minus the rewards. Coping Appraisal consists of the response efficacy, self-efficacy, and the response costs. Response efficacy is the effectiveness of the recommended behavior in preventing harm; self-efficacy is the belief that one can successfully enact the

recommended behavior; and the response costs are the physical or psychological costs associated with the recommended behavior. Therefore, coping represents the sum of the response efficacy and selfefficacy, minus the response costs.

The theories described above borrow from the fields of social psychology and marketing; however, they do not necessarily take into account the fact that smokers are addicted to cigarettes, which affects their future smoking behavior. Rooted in the field of health econometrics, the Theory of Rational Addiction [20] suggests that addicts are 'rational' to the extent that they have a consistent plan to maximize utility over time and that their consumption decisions are made in light of the future consequences of those decisions. The Model of Rational Addiction expanded upon myopic models of addiction to include *future* consumption of addictive substance in its calculation of consumption: C(t) = f[P(t), C(t-1), C(t+1), Y(t), Z(t)]; where: P(t) is the price of the good at the current time period; C(t-1) is the consumption at a previous time period; C(t+1) is the consumption at a future time period; Y(t) represents income; and Z(t) represents preferences. According to the model, cigarette consumers must be aware of smoking's long-term health effects in order to take account of future impact of current consumption. The implicit effectiveness of messaging is conditioned upon an assumption of full information. Messages or cues are viewed as a means of potentially producing better outcomes in the consumption of tobacco and other sin goods. We may find that smokers have decreased marginal utility from smoking once the harms of smoking are communicated to them in this modality. Utilizing components of these behavioral theories, a conceptual framework has been developed to guide the investigation of the impact of graphic warning labels on smoking behavior (please see fig. 1.1).

Figure 1.1. Conceptual framework of the effectiveness of graphic warning labels on smoking outcomes.



Schematic presentation of McGuire's Chain of Persuasion (red); Protection Motivation Theory (orange); the Theory of Reasoned Action (yellow); the Theory of Planned Behavior (yellow plus green); the Health Action Process Approach (blue); and the Theory of Rational Addiction (purple).

Taking these behavioral theories together, it is hypothesized that the youth response to graphic cigarette warning labels may differ from the adult response for two main reasons: 1) the level of addiction is expected to be lower among youth due to less intense smoking history; 2) visual communication of risk may be more effective among youth, helping increase the perceived harms of smoking. These two factors combined are hypothesized to lower the utility of smoking in the eyes of youth. Adolescents are still undergoing cognitive changes, such as the transition from concrete thinking to more abstract thinking. Young teenagers will mainly believe what they can see or have experienced and, thus, they cannot fully appreciate the long-term or unseen consequences. The use of visual aids in communicating the risks of smoking may be viewed as a socially productive corrective device. Even in models of rational addiction, the implicit ineffectiveness of messaging is conditioned upon an assumption of full information. Graphic warning messages or cues are viewed as a means of potentially securing socially superior outcomes in the consumption of sin goods, such as cigarettes [55].

Furthermore, it is clear from targeted advertising campaigns put forth by Big Tobacco that models of smoking vary for youth and adults. The tobacco companies have recognized that teenagers have a

unique set of attitudes, social groups, values, aspirations, role models, and activities; tobacco companies attempt to infiltrate both their physical and social environments [56]. Tobacco companies spend billions of dollars each year to promote the use of their products in emerging markets. Direct advertising includes placing ads in broadcast, print, and outdoor venues. Indirect advertising include methods such as brand stretching, product placement, and point of sale where tobacco companies concentrate much of their advertising though product displays and product sales promotions. A report issued in March 2014 by the Campaign for Tobacco-Free Kids and other international public health organizations exposes how Philip Morris International's (PMI) 'Be Marlboro' marketing campaign uses themes and images that appeal to youth across the globe. The campaign has expanded to more than 50 countries despite being banned by a German court for targeting teens and generating similar complaints in other countries [57].

This dissertation examines the impact of a counter-advertising public health campaign, in the form of graphic cigarette warning labels, on intention to smoke, susceptibility to smoking, and behavioral

outcomes among youth and adults in Southeast Asia. For our youth sample, we use the Theory of Triadic Influence (TTI) [58, 59] to guide variable selection and model design. Using the TTI as a framework, we explore the influence of variables pertaining to three overarching domains of human behavior: social/normative, cultural/environmental, and intrapersonal. Specifically, we include variables within these constructs, including socio-demographic factors (e.g., age, sex, ethnicity), behavioral factors (e.g., peer, parental influence, and perceived societal norms), and personal factors (e.g., self-esteem, rebelliousness, and future discounting) in our model of youth smoking. The theory of Triadic Influence has been shown to successfully predict adolescent smoking behavior in previous research on youth smoking and other substance abuse [60-64].

We also seek to measure the effect of graphic cigarette warning labels on adult smoking behaviors, specifically smoking intensity, quit attempts, and successful cessation. Our adult model utilizes a different set of covariates than our youth model, as we recognize that different factors affect smoking among adults and youth. Variables in our adult model include known predictors of smoking behavior: sex [4, 65-67], age [4, 66, 68], race [67], level of education [69, 70], income [68, 69], self-efficacy [66, 68], level of addiction [68], smoking history [66, 68], smoking frequency (daily versus non-daily) [4, 68], type of cigarette smoked [factory-made (FM) versus roll-your-own (RYO)] [70, 71], and exposure to anti-smoking information or advertising [72, 73].

1.2.3. Specific Aims

Aim 1: Investigate the effect of Graphic Cigarette Warning Policies on Youth Smoking Intention in Malaysia and Thailand.

Sub-Aim 1: To assess the impact of the graphic cigarette warning label policy on youth in Thailand, stratified by sex and smoking status.

Sub-Aim 2: To measure the effect of the graphic cigarette warning label policy on youth behavioral outcomes (preliminary).

Approach: Utilize a quasi-experimental design to assess the impact of graphic warning labels implemented in Thailand, using Malaysia as a control.

Aim 2: Measure the Effect of Warning Label Risk Cognition on Youth Smoking Intention in Malaysia and Thailand.

Sub-Aim 1: To assess the effect of frequency of exposure, using risk cognition as a proxy, on youth smoking intention and susceptibility in Thailand.

Sub-Aim 2: To assess the effect of frequency of exposure, using risk cognition as a proxy, on youth smoking intention and susceptibility in Malaysia and Thailand.

Sub-Aim 3: To examine the effect of frequency of exposure, using risk cognition as a proxy, on youth smoking behavior among male youth in Thailand.

Approach: Limit data to the post-implementation phase in both countries. Conduct within-country analyses, as well as combine data to assess overall impact in Southeast Asia.

Aim 3: Investigate the Impact of Graphic Cigarette Warning Label Salience on Adult Smoking Behaviors in Malaysia and Thailand and Moderating Effects of Loosies.

Sub-aim 1: To assess the effect of frequency of exposure (using label salience as a proxy) on adult smoking behavior in Thailand.

Sub-aim 2: To assess varied levels of salience (any salience v no salience; high salience v low salience) and their impact on smoking outcomes among adult smokers in Thailand and Malaysia. Sub-aim 3: To assess the purchase of loosies as a potential effect modifier on label saliency. *Approach: Limit data to the post-implementation phase in both countries. Conduct within-country analyses, as well as combine data to assess overall impact in Southeast Asia.*

The three aims of this dissertation will ultimately inform three empirical papers. We examine the effect of the graphic cigarette warning label policy on smoking behaviors and behavioral intention among youth and adults, controlling for factors at the individual and population level. Sub-aims examine outcomes stratified by country, sex, as well as smoking status. We also explore different measures of cognition and salience of graphic warning labels on smoking outcomes. The moderating effects of purchasing loose cigarette (loosies) on the association between salience of graphic warnings and smoking behaviors are also explored. All three aims are addressed using a longitudinal study design utilizing the International Tobacco Control Southeast Asia (ITC-SEA) secondary dataset.

1.2.4. Organization of the dissertation

The subsequent part of the dissertation consists of four chapters. Chapter 2 assesses the impact of the graphic cigarette warning label policy among Thai youth using a quasi-experimental approach, with Malaysian youth serving as a control (aim 1). In Chapter 3, our focus is shifted to the post-policy implementation period in both countries. In an effort to assess the impact of frequency of exposure to graphic warning labels on behavioral intentions, smoking susceptibility, and smoking behavior, we utilize a measure of cognition of risk as an effective proxy (aim 2). These analyses build upon chapter 2 by closely examining cognition of risk, a mediator of the effect of warning labels on smoking outcomes. Chapter 4 focuses on the adult behavioral response to graphic warning labels using label salience as a proxy for exposure to graphic warning labels (aim 3). We also explore the moderating effects of loosies on the relationship between label salience and smoking behavior outcomes. Loosies are of particular importance due to concerns raised that graphic labels may elicit avoidance, defensiveness, and denial, and may lead to smokers taking measures to cover the cigarette packs or buy loose cigarettes ("loosies") to avoid exposure to warning labels. As such, we hypothesized that purchasing loosies might reduce the saliency of labels. Chapter 5 summarizes findings from Chapters 2-4 and discusses strengths and limitations of the study. The dissertation concludes with policy implications and recommendations for future research directions.

1.3 Data Source: International Tobacco Control Southeast Asia Survey

The ITC-SEA Survey is a cohort survey of nationally representative samples of adult smokers in Thailand and Malaysia. Eligible respondents originally included youth smokers and non-smokers (recruitment age 13-17 in Malaysia; age 13-19 in Thailand), adult smokers (age 18+) and adult nonsmokers in Malaysia (adult non-smokers in Thailand were not recruited in any waves). Individuals in jail, those living in institutions and non-citizens were ineligible. For both countries in every wave, the sample was designed to include: 2,000 adult smokers (or quitters who had been recruited as smokers) (age 18+); 1,000 youths (age 13-17, both smokers and non-smokers).

Respondents were surveyed using face to-face interviews and were recruited from households using a stratified multistage sampling design. The primary strata consisted of Bangkok and four regions (North, Northeast, Central, and South) in Thailand, and six zones of Malaysia. In Thailand, respondents were selected from Bangkok and two provinces in each of Thailand's four regions (Chiang Mai, Phrae, Nakhon Ratchasima, Nong Khai, Nakhon Pathom, Samut Sakhon, Nakhon Si Thammarat, and Songkhla). In Malaysia, respondents were drawn from one state in each of the country's six geographic zones (Kedah, Selangor, Johore, Terengganu, Sabah, and Sarawak) at Wave 1, and a seventh state, Penang, was added in Wave 2. In Malaysia, the feedback from Wave 2 showed that conducting face-toface surveys was costly, while phone penetration especially in urban areas was quite high. It was decided that for Wave 3 the majority of the interviews could be conducted by phone (about 80%) while in some rural areas, where the phone penetration is low, face-to-face surveys could still be used. Youth surveys were all self-reported; youth respondents completed a 30-minute self-administered (i.e., pen and pencil questionnaire). Respondents were instructed to complete the survey in a private area to ensure privacy from family members and were instructed to seal the survey in an envelope to maintain confidentiality and to encourage truthful reporting. Parental permission and youth consent were ascertained prior to surveying [74].

Wave 1 was conducted from January to March 2005 in both countries, Wave 2 from July to September 2006 in Thailand, about 14–18 months after the new warnings were introduced, and in Malaysia from August 2006 to March 2007. Wave 3 was conducted from January to March 2008 in Thailand, about 11 months after the second round of pictorial warnings came into effect, and from March to September 2008 in Malaysia. Wave 4 was conducted from April to July 2009 in Thailand, and July to November 2009 in Malaysia, about 7 months after pictorial warnings there were first implemented. Wave 5 was conducted from February to April 2011 in Thailand, approximately one year after the size of pictorial labels was expanded to 55% of the front and back of packs, and from May to April 2012 in Malaysia. Tables 1.1 and 1.2, below, display data collection dates and sample composition for Malaysia and Thailand.

Table 1.1. Data collection dates and sample composition of the ITC-SEA Malaysia survey.

ITC-SEA Malaysia Survey Collection

Wave	Survey Dates	Survey Sample
1	January to March 2005	2,004 Smokers, 1,555 Non-Smokers and 1,008 Youth
2	July 2006 to June 2007	1,640 Smokers and Quitters, 1,572 Non-Smokers and 777 Youth
3	February to September 2008	1,957 Smokers and Quitters, 1,486 Non-Smokers and 712 Youth
4	July to November 2009	2,045 Smokers and Quitters, 789 Non-Smokers and 878 Youth
5	May 2011 to April 2012	2,007 Smokers and 928 Youth

Table 1.2. Data collection dates and sample composition of the ITC-SEA Thailand survey.

ITC-SEA Thailand Survey Collection

Wave	Survey Dates	Survey Sample
1	January to March 2005	2,048 Smokers and 1,000 Youth
2	August to September 2006	2,158 Smokers and Quitters and 927 Youth
3	January to March 2008	2,607 Smokers and Quitters and 1,096 Youth
4	April to July 2009	2,430 Smokers and Quitters and 947 Youth
5	February to April 2011	2,175 Smokers and 963 Youth

1.4. Significance of the dissertation

The dire need for research on effective tobacco control policies is underscored by the shift of tobacco markets to developing countries. Strict regulation and the success of anti-smoking campaigns continue to hit tobacco firms' revenues in the Western world. Big Tobacco has shifted its focus on the few large markets that have growth potential and a relative lack of regulation, with Southeast Asia representing a prime opportunity. Tobacco firms see growth potential in the region's low rate of women

smokers. Across Southeast Asia, fewer than one in ten women smoke, compared with about 40-70% of men. A 2009 study across seven countries found that smoking rates were rising significantly among under-16 girls in the Philippines, Malaysia, Indonesia and Vietnam [75]. In Indonesia and the Philippines, tobacco companies have ramped up advertising to young girls, with tactics such as selling cigarettes in small “lipstick packs” that seek to capture the glamour of high-end cosmetics. Countries struggling with widespread poverty and unemployment may be reluctant to clamp down on an industry that provides revenue and employment. However, they are also, slowly, coming to recognize the health-care costs associated with smoking, and the human suffering from tobacco-related disease [75].

Worldwide, smoking kills nearly six million people annually. More than five million of these deaths are the result of direct tobacco use, while more than 600,000 deaths are the result of non-smokers being exposed to second-hand smoke. A total of 8.6 million people currently suffer from smoking-caused illness. Over 70% of deaths from bronchial, tracheal, and lung cancer are attributable to tobacco use. Compared to nonsmokers, smoking increases the risk of men developing lung cancer by 23 times; of women developing lung cancer by 13 times; and of either sex dying from COPD by 12 to 13 times [1]. Approximately 90% of chronic obstructive pulmonary disease (COPD) deaths are caused by smoking [2, 3]. There is no question that policies to reduce smoking, if successful, will reduce the burden of lung disease, and save countless lives. One such policy, the implementation of graphic cigarette warning labels, has been somewhat controversial, mainly due to the dearth of research investigating the effectiveness of graphic cigarette labels in influencing smoking *behavior*, particularly in developing countries where the need for tobacco control policies is crucial.

Research on the advantages of graphic versus text-only warnings has only rarely addressed the issue of differential effects across population subgroups. Research on the effects of graphic warnings among populations in developing countries is critical to ensure that this policy addresses, or at least does not exacerbate, tobacco-related health disparities. A growing body of research has shown that disadvantaged groups may differ in their ability to access, process and act on health information–a phenomenon that has been characterized as communication inequality [76]. Studies have documented substantial communication inequalities in access to and processing of information across population

subgroups [76-78], particularly for lower SES groups. Such inequalities often parallel disparities in smoking-related health knowledge and health outcomes. [26]–[30] Although incompatibility between the level at which information is presented and the audience's level of literacy and numeracy is typically cited as an important factor, [31], [32] other factors also may influence processing, including differences in the type of messages that attract viewers' attention, varying interpretation of messages, and variation in the perceived credibility of messages. [33]–[35] Yet the belief that a health message is credible, or the type of message that grabs a smoker's attention and motivates intentions to quit, may be linked to factors related to an individual's social class, education or racial/ethnic background [10].

The goal of this research is to evaluate the impact of graphic warning labels on smoking behavior, which will ultimately affect the lung and overall health of the population. Smokers report that their main source of risk information is obtained from cigarette packages more than any other source, except for television campaigns [4, 5]. Pictorial warnings may be particularly important in communicating health information to populations with lower literacy rates [4], as well as youth. It has been estimated that over 6 million children under the age of 18 alive today will ultimately die from smoking, unless smoking rates decline. Every day, more than 3,000 youth under the age of 18 try smoking for the first time; and an additional 700 youth become regular daily smokers [6]. Understanding the effectiveness of graphic warning labels among youth, taking into account the underpinnings of smoking behavior, or key predictors, and how to influence those predictors, is integral to the goal of reducing the enormous toll of lung disease on health care costs and quality of life.

The overarching aim of this research is to measure the effect of graphic labels as a tobacco policy, focusing on youth. It is widely accepted that the majority of smokers began the habit in their teenage years; seventy percent began smoking regularly at age 18 or younger [7]. If graphic labels prove effective among youth, evidence-based and cost effective tobacco policies could significantly reduce lung disease by preventing a generation of smokers from forming. This research represents a timely step to advance knowledge of the effectiveness of graphic labels, as well as the determinants of effectiveness, e.g. whether effectiveness varies by sociodemographics, past behavior, personality, and environmental factors.

The strength, innovation, and significance of this dissertation research can be summarized in three ways: 1) the focus of policy effectiveness graphic cigarette labels addresses one of the highest public health priorities for tobacco control and the prevention of tobacco-related lung disease, e.g. youth smoking initiation; 2) the comparative assessment of Thailand and Malaysia develops original, unique, and timely information for global health policy decision makers, especially in developing countries; and 3) the advanced quantitative methodology proposed takes advantage of newly available longitudinal data, thus allowing a rigorous design to better understand behavioral and environmental determinants of policy effectiveness. If graphic warning labels are found to be effective in reducing smoking behavior, these findings may be used to support their implementation in other countries where they are currently not

mandated. If effective, pictorial labels would represent an inexpensive, far-reaching policy intervention with a high frequency of exposure that has the potential of saving billions of lives.

Chapter 2. The Effect of Graphic Cigarette Warning Policies on Youth Smoking Intention in Southeast Asia: Results from International Tobacco Control Project

2.1. Introduction

The health and economic burden of tobacco use is rapidly shifting from high- to low- and middleincome countries. Seventy percent of the world's 1.1 billion smokers live in developing nations, with over 50% in Asia alone [79]. The tobacco burden is especially high in the World Health

Organization's SouthEast Asia Region (SEAR), making it an especially important region for global tobacco control given its large population and upward trajectory of smoking rates [80].

Two SEAR countries, Thailand and Malaysia, demonstrate different stages of tobacco control in this critical region. For more than a decade, Thailand has served as a model for tobacco control in Asia, introducing comprehensive policies, including graphic (or pictorial) warning labels on cigarette packages, in March 2005. Overall, 55% of the package space was appropriated to the graphic warnings which included six rotating messages. Thailand has since updated health warnings regularly with regard to size and content of graphic images. Even so, 24% of Thai adults (defined as individuals aged 15 years or older) reported being current smokers in 2011, translating to 13 million individuals, predominantly men; that year, 46.6% of Thai adult men reporting being daily smokers, as opposed to only 2.6% of Thai women [8]. With regard to youth smoking, a total of 11.7% of youth (defined as individuals under the age of 15 years) reported smoking cigarettes in 2009. Similar gender disparities among adult smokers exist among youth, with 20.1% of boys and 3.8% of girls reporting smoking [81].

Malaysia, dissimilarly, has had until recently few comprehensive tobacco control policies, and has thus remained a tobacco-friendly country. In 2011, approximately 23.1% of Malaysians reported being current smokers. As in Thailand, there exist dramatic gender disparities among smokers, with 43.9% of men reporting smoking, as compared to only 1% of women [82]. With regard to youth, 18.2% of Malaysian youth reported being current smokers in 2009, with a gender breakdown of 30.9% of boys and 5.3% of girls [81]. Nevertheless, in recent years, Malaysia has made significant strides in tobacco control policy including the implementation of six rotating graphic warning labels in January 2009. Graphic warnings are required to cover 40% of the front and 60% of the back of all cigarette packages, equating to 50% of the overall package space.

2.1.1. Youth Smoking and Vulnerability

Previous research on Thai and Malaysian youth indicates that smokers try their first cigarette at an average age of 14 years. Smokers in each country reported smoking their first cigarette as early as 8 years of age, with almost one-fifth of smokers trying their first cigarette before 13 years of age [83]. Among youth, factors that influence early trials with cigarettes may be separate from those that influence

progression and persistence; notably, peer influences emerge as powerful motivators of behavior change during adolescence [84]. Adolescence and young adulthood encompass critical social transitions to full adulthood, wherein youth extend risk-taking as they sample and, in some instances, acquire adult behaviors. These periods thus comprise a unique window of vulnerability for tobacco use onset. Nonetheless, risk-taking is a single, though complex, component of multi-determined, behavior. Cigarette smoking is influenced by a broad set of distinct and overlapping biological, psychosocial, and environmental factors. The putative efficacy of graphic warning labels derives from the successful use of 'fear appeals' to communicate risk [85], emphasize loss avoidance and risk aversion [37], and increase message retention [86]. The cognitive ability of youth to respond to such mechanisms is, however, questionable. For example, adolescents and teenagers possess high 'discount rates,' that they are more likely than adults to systematically undervalue future consequences of their current behavior [87]. In addition, brain development in adolescence remains incomplete, as the prefrontal cortex, which controls reasoning and impulses, is not fully developed until the age of 25 [88]. We hypothesize that visual communication of risk may help significantly increase the perceived harms of smoking, thus reducing smoking intention among youth.

2.1.2. Effectiveness of Graphic Cigarette Warning Labels

Conceptual arguments for the implementation of graphic cigarette warning label assert their influence on behavior via pre-cursers, such as knowledge, attitudes, and beliefs. Theoretical research in public health and psychology suggest that graphic cigarette warning labels may effectively communicate the risks associated with smoking, serving as a cue for behavioral change such as cessation and decreased intensity, or even as a preventive measure to hinder smoking initiation, which is especially relevant to youth populations. Although extensive research has been conducted on the adult behavioral response to graphic warning labels enacted in Canada, Australia, and other Western countries, there is a dearth of studies in developing countries. There are even fewer studies on the effect of graphic warning labels on *youth* smoking behavior, which is surprising given that smoking initiation most often occurs during youth and young adulthood, and early initiation is associated with a greater dependence and higher mortality from smoking-related diseases [89-91]. The goal of our research is therefore to assess

the effect of warning label policies on youth smoking intention in Thailand and Malaysia. Additionally, we conduct preliminary analyses of youth smoking behavioral outcomes, however, power is limited due to the small sample of youth smokers. To our knowledge, this is the first study to utilize longitudinal data to conduct cross-national analyses of the effect of graphic warning labels on the youth response.

Among adults, there is substantial evidence favoring the effectiveness of graphic health warnings [14, 20, 92-99], specifically with regard to intentions to quit, thoughts about health risks, decreased smoking prevalence, and cessation behavior [92, 100, 101]. Studies have shown that large graphic warning labels on cigarette packages are an important source of health information for smokers and nonsmokers [37]. Exposure to graphic labels has been shown to reduce cigarette packet appeal [26],

increase health knowledge, awareness and perception of risks associated with smoking [13-15, 17, 20, 94, 95, 100, 102], strengthen intentions to quit [94], encourage quit attempts [13, 20, 26, 100, 102], increase use of quitlines [95], prevent relapse [103], discourage smoking initiation [26, 100, 102] and decrease the odds of being a smoker [20, 101].

The limited evidence on the effectiveness of warning labels in developing countries suggests similar findings to those in Western countries. An experimental study conducted in Malaysia suggested that graphic labels had a greater impact positive impact than text-only labels [22]. Similarly, an experimental study in China found that adult smokers were more likely to rate graphic versus text-only labels as more effective in motivating smoking cessation and preventing smoking among youth [104].
Other studies have supported graphic labels' impact on cognitive and behavioral reactions and interest in quitting [16, 105]. A study by Yong et al. (2013) utilized a quasi-experimental design to assess the impact of graphic labels in Thailand, using Malaysia as a control, as pre-graphic label implementation data were utilized for comparison purposes. Thai smokers' awareness and cognitive and behavioral reactions increased markedly after the introduction of graphic labels, with effects sustained at follow-up; by contrast, no significant change was observed in Malaysia over the same time period [71].

The majority of research on the youth response to graphic warning labels consists of preimplementation, experimental studies. Several of these studies have found that graphic labels

positively affect the smoking knowledge, attitudes, and beliefs among adolescents [102, 106-109]. Post-policy implementation research on the youth effects of graphic cigarette warning labels is far more limited, but is suggestive of warning labels' effectiveness among adolescents and young adults [96, 99, 102, 106, 108111]. One study conducted in Australia suggests that graphic warning labels increased cognitive processing, with youth more frequently reading, attending to, and talking about labels at follow-up (versus text-only labels). Experimental and established youth smokers reported thinking about quitting and forgoing cigarettes at follow-up [99]. A Greek study of adolescents found that graphic warning labels were more effective than text-only labels in informing youth about health effects of smoking and preventing initiation [96]. Research has found that graphic labels are more effective than text-only labels in motivating youth smokers to quit and ex-youth smokers to remain quit [102]. However, there are contradictory studies that have found that adolescents do not report seeing or remembering graphic labels more than text-only labels, and that awareness of graphic labels is not associated with reduced smoking [106]. Another study has suggested that adolescents do not believe graphic health warnings will influence adolescents who already smoke [109].

Conceptual arguments against the implementation of graphic warning labels relate to avoidance, defensiveness, and denial. Some studies have found that graphic warning labels are not effective in their intent to promote cessation and reduce smoking behavior. Furthermore, there is some evidence that graphic warnings incite defensiveness in response to fear-arousing information [28, 30, 31]. Problems may arise when the fear induces a more pressing concern while curbing the immediate experience of fear, often by attempting to undermine the importance or credibility of the message. Self-affirmation theory [32] states that people are fundamentally motivated to protect their sense of self-integrity; this is the motive that is most aroused by threatening material, such as graphic warnings, and is satisfied by defensiveness [33]. The tobacco industry has suggested that the use of large pictures may reduce the effectiveness of health warnings and could actually lead to increases in smoking behavior; however, there is no evidence that pictorial warnings lead to 'boomerang' effects [112]. Comprehensive cross-national studies have found that the Australian pictorial warnings, introduced in 2005, led to greater avoidant behaviors (e.g. covering up the pack, keeping it out of sight, or avoiding particular labels), compared to

Canada, the United Kingdom, and the USA [13, 14]. Importantly, however, those smokers who engaged in avoidant behaviors were no less likely to intend to quit or to attempt to quit [13], replicating the findings of a study of the Canadian warnings [93]. With regard to empirical flaws, Ruiter and Kok [28, 29] argue that the evidence of the effectiveness of graphic warnings is sparse and unconvincing, and find flaws in the current research such as poor controls for mediating variables. They point out the lack of longitudinal evidence comparing attitudes toward smoking and smoking trends prior to and following the implementation of graphic labels in a specific population.

Graphic warning labels have been investigated in relation to changes in smoking intention and behavior among adults and youth, although there are few post-policy implementation studies on youth. Furthermore, the majority of research on this topic relies upon data collected *after* the introduction of warning labels, without any pre-policy implementation data for comparison. While there do exist

experimental studies conducted on graphic warning labels, most are limited with regard to external validity. Given that package warning labels are introduced at the national level, and that countries cannot be randomized to different conditions, it is simply not possible to conduct experimental research on the implementation of pictorial warnings. The most rigorous alternative would be a quasi-experimental research design that includes pre- and post-evaluations, across several countries that can serve as comparison groups. Such designs are high in both internal and external validity [113]. Hammond et al. [13] conducted one such study comparing the effectiveness of cigarette warning labels among adults in Australia, Canada, the United Kingdom, and the United States. Our study similarly addresses gaps in the literature by measuring behavioral change pre- and post- policy implementation among youth in Malaysia and Thailand using a quasi-experimental design. To our knowledge, this is the first study to conduct longitudinal assessment of the youth behavioral response to graphic warning labels utilizing pre- and post – implementation data. Furthermore, this study addresses the following gaps in the current literature on graphic warning label policies: 1) lack of longitudinal studies utilizing pre- and post- policy data; 2) lack of measurement of behavioral intention or behavioral change among youth 3) lack of studies on the effectiveness of graphic warning labels in Southeast Asia.

2.2. Methods

2.2.1. Data source

This study utilized nationally representative data from the International Tobacco Control South East Asia (ITC SEA) survey. Details on the conceptual framework of the ITC Project and its methodology have been published elsewhere [11, 12]. Briefly, the ITC SEA survey is a prospective, longitudinal, cohort survey of youth and adults in Thailand and Malaysia. Eligible respondents originally were youth smokers and non-smokers (recruitment age 13-17 in Malaysia; age 13-19 in Thailand), adult smokers (age 18+) and adult non-smokers in Malaysia; adult non-smokers in Thailand were not recruited in any waves. As this study examines the youth response, adult subjects were excluded from the sample. Respondents were surveyed using face to-face and phone interviews, and were recruited from households using a stratified multistage sampling design. Information on the complex sampling design have been detailed by Yong et al. (2013) [71]. Youth surveys were all self-reported; youth respondents completed a 30-minute

self-administered (i.e., pen and paper questionnaire). See table 2.1 for data collection dates and sample composition for the five waves of ITC-SEA surveys. See figures 2.1 and 2.2 for a timeline of tobacco policies and ITC survey data collection waves in Thailand and Malaysia, respectively.

2.2.2. Measures

2.2.2.1. Primary Outcome Variables: Behavioral Intentions, Susceptibility, Label Salience, and Cognition of Risk

Youth behavioral intentions were measured by the following variables: plan to *smoke* (measured among non-smokers, never-smokers, and current smokers) and plan to *quit* within one month and within six months (among smokers). **Plan to smoke,** a binary variable, was assessed based on participant responses (four-point ordinal scale) to the following question: “At any time during the next year do you think you will smoke a cigarette?” The responses “probably yes” and “definitely yes” were coded 1 (i.e., plan to smoke in the following year); the remaining responses (“probably no” and “definitely no”) were coded 0 (i.e., no plan to smoke in the following year). **Plan to quit,** among smokers, was also a binary variable. It was assessed based on responses to the following survey question: “Which of the following describe your thoughts about quitting smoking?” Responses comprised: “I plan to quit in the next 30 days

[1 month]"; "I plan to quit sometime in the next 6 months"; "I plan to quit, but not in the next 6 months"; and "I do not plan to quit at all". Respondents who reported planning to quit within the next 30 days or 6 months were coded 1; all those who reported not planning to quit were coded 0.

Smoking susceptibility, among non-smokers (including former and never-smokers), was a binary variable based on responses to two survey questions, each of whose responses were on a fourpoint ordinal scale (responses: definitely yes, probably yes, probably not, definitely not). The questions were: 1) "If one of your best friends were to offer you a cigarette, would you smoke it?" and 2) "At any time during the next year, do you think you will smoke a cigarette?" Participants who answered "definitely yes," "probably yes," and "probably not" to either question were coded 1, indicating susceptibility. Otherwise, respondents were coded 0, suggesting non-susceptibility. The coding scheme for susceptibility was developed by Pierce et al [114], and has been utilized by similar research on youth smoking in Southeast Asia [115].

Label salience, known in this literature as "noticing" labels, was measured by the survey item: "In the last month, how often, if at all, have you noticed health warnings on cigarette packages?" Participants who answered "very often" or "often" were coded 1, suggesting salience. Otherwise, respondents who answered "never" or "once in a while" were coded 0.

Cognition of risk, among participants who reported ever noticing labels, was assessed by the survey item: "To what extent, if at all, have the health warnings made you think about the health risks of smoking?" Respondents who answered "a lot" were coded 1, indicating high cognition. Participants who answered "a little" or "not at all" were coded 0.

2.2.2.2. Secondary Outcome: Smoking Behavior

Smoking behavior is measured by 5 separate variables: smoking initiation, high-intensity smoking, quit attempt, increased smoking intensity, and reduced smoking intensity. **Smoking initiation,** a binary variable, takes the value 1 where non-smokers at the baseline wave report smoking at follow-up.

Smokers at follow-up include participants who reported smoking more than 100 cigarettes in their lifetimes and at least one cigarette in the last 30 days. **High intensity smoking,** among smokers, is a binary variable that takes the value 1 if respondents report smoking 10 or more cigarettes per day, and 0 if respondents report smoking 9 or fewer cigarettes per day. **Quit attempt,** among baseline smokers, is a binary variable that takes the value 1 if respondents indicated that they attempted to quit smoking in the last year (responses "in the last month" and "in the last year" combined). Changes in smoking intensity, among smokers, was measured by two binary variables: **increased intensity** and **decreased intensity.** Increased intensity was coded 1 if daily cigarette consumption at follow-up was greater than that at baseline, and 0 otherwise; decreased intensity was coded 1 if baseline consumption was greater than that at follow-up. Intensity at both waves was measured by ordinal, categorical, variables.

2.2.2.3. Independent Variable of Interest: Warning Label Policy (Country)

To assess the effect of the graphic warning label policy on smoking outcomes, we use 'country of residence' as a proxy for the implementation of the policy. We limit our data to wave-pairs 2 and 3 which captures the pre-implementation period in Malaysia and post-implementation period in Thailand. As such,

Thailand represents the experimental group and Malaysia serves as a control in our quasi-experimental design. Therefore, differences in smoking outcomes in Thailand versus Malaysia (reference group), should reflect the impact of the graphic cigarette warning label policy, after controlling for covariates.

2.2.2.4. Control Variables

The potential set of basic control variables comprise gender (female=1), age (proxied by being of legal smoking age follow-up=1), religion (3 dummy variables: Islam, Buddhism, and other (referent)), ethnicity (majority group vs. minor group (referent)), and urban/rural status (rural=referent). Ethnic minority status and urban/rural status were obtained from the household enumeration, which was completed by an adult informant. Religion and ethnicity were ultimately omitted from GEE analyses, as they were highly correlated with country of residence, as participants from Malaysia are primarily Islamic and Malay, and participants from Thailand predominantly Buddhist and Thai. We also control for cohort

(the wave in which participants were first recruited into the ITC Project) and wave-pair, which are an attempt to account for secular changes in smoking attitudes and behavior.

2.2.2.5. Additional Covariates

A set of additional control variables account for cultural/attitudinal, social/normative, and intrapersonal factors. Such factors, derived from the Theory of Triadic Influence (TTI) [58, 59], have been shown to predict adolescent smoking behavior in previous research on youth smoking and other substance abuse [60-64]. **Cultural/attitudinal** variables encompass the demographic variables previously outlined. **Social/normative** variables included: peer smoking, smoking at home, and perceived societal norms. Peer smoking was assessed by responses to the question: "Of the five closest friends that you spend time with on a regular basis, how many of them are smokers?" A response of 0 friends was the referent category. [No] smoking at home was measured by the survey item: "During the past 7 days (one week), how often have people smoked inside your home while you were there?" Responses comprised: "never," "sometimes," and "often." Respondents who answered "sometimes" or "often" were coded 0, indicating smoking at home (referent). A measure of perceived societal norms was constructed based upon level of agreement with the statement: "Society disapproves of smoking." Responses comprised: "agree," "in-between" and "disagree" (referent).

Intrapersonal factors included: self-esteem, rebelliousness, and future discounting. Self-esteem was a binary variable assessed by the survey item: "Choose one statement below that best describes you in the past two weeks, including today." Respondents who answered "I hate myself" or "I do not like myself" were coded 0, suggesting low self-esteem (referent). Respondents who answered "I like myself" were coded 1, indicating high self-esteem. A binary measure of rebellion was assessed by the survey item: "I do things my parents would not want me to do." Respondents who answered: "never" or "sometimes" were coded 0, indicating little or no rebelliousness (referent). Respondents who answered "often" were coded 1, indicating rebelliousness. Future discounting was assessed by level of agreement to the statement: "I spend a lot of time thinking about how what I do today will affect my life in the future." Participants who responded "agree" were coded 1 indicating a low discount rate. Respondents who answered "in-between" or "disagree" were coded 0 indicating a low discount rate (referent).

2.2.3. Analysis

2.2.3.1. Descriptive Analysis

Univariate statistics were used to describe the sample. Results are stratified by country (Malaysia and Thailand), as well as smoke status (non-smokers and smokers). We present frequencies as well as sample proportions displayed as column percentages.

2.2.3.2. Inferential Analysis

We used data from four years (2006-2009) of the ITC-SEA. The data were arranged in two wavepairs, in which we combined contiguous baseline and follow-up data.

Wave-pair 1	**Wave-pair 2**	**Wave-pair 3**	**Wave-pair 4**
Wave 1 + Wave 2	Wave 2 + Wave 3	Wave 3 + Wave 4	Wave 4 + Wave 5
TH: Jan 2005 – Sept 2006	TH: Aug 2006 – Mar 2008	TH: Jan 2008 – July 2009	TH: Apr 2009 – Apr 2011
MY: Jan 2005 – June 2007	MY: Aug 2006 – Sept 2008	MY: Feb 2008 – Nov 2009	MY: Jul 2009 – Apr 2012

The 2006-2009 period reflects a policy environment in which Thailand had enacted graphic cigarette warning labels (i.e., existed in post-policy period) and Malaysia had not (i.e., was in pre-policy period).

Equation (1) depicts the relationship between our smoking outcomes and policy differences across Thailand and Malaysia.

$$\text{Logit}(P(\text{SMOKING OUTCOME}_{it})) = \beta_0 + \beta_1 \bullet \text{COUNTRY}_i + \beta_x \bullet X_{i(t-1)} \quad (1)$$

In our model, SMOKING OUTCOMES, which were measured at follow-up (time t), were regressed on COUNTRY (the time-consistent policy proxy), and a vector of covariates (X), which were lagged to the baseline (t-1) of each data wave-pair, and β_0 is the regression constant. We estimated the models with Generalized Estimating Equations (GEE) models, which generate population-averaged (marginal) effects of graphic cigarette warning labels on smoking outcomes. GEE is preferable to other techniques (e.g., fixed effects regression) for several major reasons. First, it corrects for intra-subject correlation that arises from repeated-measures data. Second, it estimates population-averaged coefficients directly from observed data without restrictive assumptions about heterogeneity across individuals in the parameters [116]. Third, it accommodates dependent variables of various distributions

(e.g., linear, logit, count, etc.). Finally, it permits the overt estimation of regression parameters on timeindependent covariates, whose effects on the outcomes may be of interest to the investigator or policymaker.

We fitted separate, gender-stratified, models of the effect of graphic cigarette labeling for each smoking outcome. In accordance with the Theory of Triadic Influence (TTI), the models were built in a partially hierarchical fashion, wherein we added a theoretically linked set of covariates at each stage in the process, while removing the set that was added in the previous step. The first, benchmark, model specification included the policy variable (Thailand =1; Malaysia = referent) and demographic controls (cultural/attitudinal factors); the second specification added social/normative variables to the initial specification; the third, and final, specification added intrapersonal factors to the first specification, but omitted the social/normative set. All models controlled for wave-pair (i.e., time) and cohort. Only crude, unadjusted models, were fitted for smoking behavior, as an insufficient number of youth smokers precluded model convergence when covariates were controlled. Smoking behavior models were, moreover, estimated only among male youth, due to the low prevalence of smoking among female youth in both Thailand and Malaysia. The decision to stratify is based on documented disparities in smoking across men and women [8, 81, 82]; this decision was further supported by the results of tests of sex differences in our models. In pre-estimation testing, we observed statistically significant ($p>0.0001$) coefficients on country x gender interactions in all model specifications.

Our analyses were conducted using SAS-Callable SUDAAN version 11.0.1 to account for the multistage sampling design and oversampling used in the ITC-SEA Project and the longitudinal nature of the data. Analyses were conducted using unweighted and weighted data for all models, with no significant differences observed between weighted and unweighted analyses. Results are presented for weighted analyses, with standard errors and model coefficients adjusted accordingly. As all outcomes are binary, we generate odds ratios and 95% confidence intervals. The QIC (Quasi-likelihood under the Independence model Criterion) statistic was used for comparing models fit with likelihood-based methods among otherwise equally suitable structures.

2.3. Results

Table 2.2 contains summary statistics for country-stratified sample by smoking status.

Approximately 5.56% of the Malaysian sample and 10.30% of the Thai sample reported being current smokers at follow-up. Other relevant information may be obtained from Table 2.2. Tables 2.3 and 2.4 present gender-stratified results of regressions that estimated the association between smoking outcomes and graphic cigarette labeling (proxied by country; Thailand=1), specifically, plan to smoke and smoking susceptibility, and label salience and cognition of risk, respectively. The regression models were estimated among relevant groups of participants. (For example, analysis of "plan to quit" is performed among current smokers only, whereas analysis of "susceptible to smoke" is conducted exclusively among non-smokers and never-smokers.) Once more, three model specifications of smoking behavioral intention were modeled using the Theory of Triadic Influence (TTI) as a framework [58, 59]. Independent effects of adjustment variables are specified in relevant tables.

2.3.1. Smoking Intention and Susceptibility

In Table 2.3, we present results for the smoking intention outcomes (**plan to smoke** and **plan to quit)** and **smoking susceptibility.** Our measure of 'plan to smoke' has different implications for our three classifications of smokers (non-smokers, never-smokers, and current smokers). Planning to smoke *among non-smokers or never-smokers* is effectively a measure of intention to *initiate* smoking, whereas planning to smoke among current smokers is a measure of intention to *sustain* the habit. With regard to plan to smoke the following year among male non- or never-smokers, country effects were not significant. Thus, graphic cigarette labeling is not associated with smoking initiation when cross-national data are used to proxy the policy effect. Nevertheless, among male smokers, country effects were highly significant for model 1 [OR=0.19, 95% CI (0.08, 0.46)], model 2 [OR=0.16, 95% CI (0.06, 0.42)], and model 3 [OR=0.17, 95% CI (0.06, 0.46)], implying that living in Thailand significantly reduced the odds of planning to *continue* smoking by roughly 50%. Alternatively, among females, significant country effects were found among non-smokers and never-smokers in model 1 [OR=0.35, 95% CI (0.12, 0.97)], model 2 [OR=0.30, 95% CI (0.11, 0.82)], and model 3 [OR=0.25, 95% CI (0.09, 0.72)]. In this case, living in Thailand reduced odds of planning to smoke by between 65% and 75% compared with living in Malaysia. (Please note that results for female non-smokers and never-smokers are equivalent, as there were no female "former smokers" in the sample which would have inflated the number of non-smokers.)

The **plan to quit** outcome was estimated solely among male smokers, as there were insufficient female youth smokers in our sample. Country of residence (living in Thailand) significantly increased the odds to plan to quit within 6 months in model 1 [OR=2.68, 95% CI (1.20, 5.99)], model 2 [OR=2.75, 95% CI (1.04, 7.30)], and model 3 [OR=2.96, 95% CI (1.19, 7.33)]. Therefore, male youth smokers in Thailand, where the graphic cigarette labeling policy was in place, were 2.7 to nearly 3 times more likely to plan to quit smoking than youth smokers in Malaysia, where no policy existed.

With regard to **smoking susceptibility,** country effects did not reach significance among male youth (non-smokers, never-smokers, or current smokers). Among female non- and never-smokers, residing in Thailand was associated with significantly lower odds of (any) smoking susceptibility in model 1 [OR=0.41, 95% CI (0.21, 0.79)], model 2 [OR=0.42, 95% CI (0.22, 0.77)], and model 3 [OR=0.39, 95% CI (0.18, 0.83)].

2.3.2. Label Salience and Cognition of Risk

Table 2.4 contains results for **label salience** and **cognition of risk.** Among male non-smokers and never-smokers, **label salience** was significantly associated with country of residence. The odds of reporting high (vs. low) label salience among male non-smokers was elevated by approximately 50% in Thailand, relative to Malaysia, in model 1 [OR=1.50, 95% CI (1.01, 2.24)], model 2 [OR=1.51, 95% CI (1.03, 2.21)], and model 3 [OR=1.68, 95% CI (2.13, 2.51)]. Similar, but stronger, results were found for male never-smokers {model 1 [OR=1.90, 95% CI (1.07, 3.38)], model 2 [OR=1.93, 95% CI (1.10, 3.38)], and model 3 [OR=2.04, 95% CI (1.16, 3.59)]}. We found no significant increase in odds of label salience among male smokers. The results were similar for female non-smokers and never-smokers. Thai female non- and never-smokers had approximately double the odds of high label salience of similar Malaysian females, in model 1 [OR=2.04, 95% CI (1.44, 2.89)], model 2 [OR=2.03, 95% CI (1.41, 2.91)], and model 3 [OR=1.74, 95% CI (1.24, 2.45)].

We found no significant association among male youth between **cognition of risk** and country of residence. Among female non- and never-smokers, participants living in Thailand had significantly higher odds of high cognition of risk (vs. low) than in Malaysia, in model 1 [OR=3.41, 95% CI (1.64, 7.11)], model 2 [OR=3.57, 95% CI (1.83, 6.95)], and model 3 [OR=2.87, 95% CI (1.35, 6.11)].

2.3.3. Smoking Behavior: Preliminary Results

Results of preliminary analysis of smoking behavior are presented in Table 2.5. We consider the results to be preliminary, or exploratory, because the models have limited statistical power, due to the somewhat small number of youth smokers and the further categorization of such smokers into outcome typologies. Given the data limitations, our models contain few adjustment variables, whose effects are presented in Table 2.5. In none of the behavioral models did graphic cigarette labeling (proxied by residing in Thailand) achieve statistical significance. Nevertheless, all coefficients were in the expected direction, and one outcome (quit attempt within the past year) had a strong trend toward statistical significance (OR=1.66, p=0.09).

2.4. Discussion

In this study, we used a quasi-experimental design to investigate the association between graphic cigarette labeling and smoking outcomes among Southeast Asian youth. More specifically, we examined how residing in Thailand, a country with a graphic warning policy, rather than residing in a Malaysia, a neighboring country without such a policy during the study frame, was related to numerous measures of

smoking, including intention, processing and cognition, and actual behavior. The results of genderstratified multivariate regression models indicated that living in Thailand (vs. Malaysia) was associated with: lower intention (plan) to smoke among male current smokers and female non-smokers and neversmokers; higher intention to quit among male smokers; reduced susceptibility to smoking among female non- and never-smokers; higher label saliency among both male and female non- and never-smokers; and higher cognition of risk among female non- and never-smokers. Although our analyses did not reveal significant associations between graphic warning labels and actual smoking behavior, we should make clear that those analyses were constrained by low statistical power, and should thus be interpreted as purely exploratory. Our findings align with those of some earlier research on the adult response in Southeast Asia, although differences in study frame, design, stratification, and models of smoking preclude direct comparison [22, 71, 105].

Whereas potential mechanisms for our results are not explored in this study, reasoned speculation may have some value in the consideration of our findings. For example, reductions in

smoking intentions among smokers could conceivably be motivated by short-term health effects. Smoking impairs young people's physical fitness, in terms of both performance and endurance—even among trained youth athletes [89]. Furthermore, teenage smokers suffer from shortness of breath almost three times as often as teens who do not smoke, and produce phlegm more than twice as often as teens who do not smoke [117]. Quite unrelated to adverse health, social stigma—resulting from societal, cultural, or religious norms—may also engage in the causal pathway. 'Social denormalization,' a process that seeks 'to push tobacco out of the charmed circle of normal desirable practice to being an abnormal practice' [118], is widely regarded as essential to successful policy outcomes.

Indeed, the influence of several social factors is revealed by our analyses—albeit as direct effects, rather than as mediators. Independent effects of covariates on smoking intention and susceptibility are presented in Tables 2.6.a--2.6.h.; label saliency and risk cognition in Tables 2.7.a.-2.7.h.; and smoking behavior in Tables 2.8.a.—2.8.e. *Peer smoking* was significantly associated with several outcomes: plan to smoke among male non-smokers, female non- and never-smokers; smoking susceptibility among male non-smokers and never-smokers; and label salience among male nonsmokers. *Smoking at home* was associated with plan to quit among male smokers and label salience among male never-smokers. *Society disapproves of smoking* was associated with plan to quit among male smokers.

This investigation builds on existing research in three notable ways. First, the use of 3 years of data allows us to circumvent the undue influence of extraneous policy events, and generate sufficient person-wave observations to analyze gender strata. Second, to our knowledge, this is the first study to examine the post-implementation youth response to graphic warning labels in Southeast Asia. Third, our quasi-experimental design is a rigorous approach, high in both internal and external validity [113].

There are, nevertheless, limitations that should be noted. First, our smoking measures are selfreported. Therefore, although research has affirmed the reliability and validity of measuring tobacco use through self-report methods [119], our measures may be prone to downward bias, and as a result, understate true tobacco use and intention to smoke. Second, our study lacks measures that may capture the mechanism through which the graphic warning labels affect smoking behaviors and behavioral intention. A similar study conducted among adults [71] found that graphic warnings not only had a significant impact on salience (versus text-only labels), but also on cognitive and behavioral reactions.

Taken together with experimental evidence that has consistently shown the sustained effect of graphic warning labels [120], this would suggest that the labels effect behavioral change directly, and not solely through the novelty of design. Third, our findings may be confounded by peripheral anti-smoking campaigns in Thailand during the study frame. Specifically, a major campaigned aimed at educating the public about the harm of secondhand smoke and passive smoking was launched just prior to wave 2 data collection (from May to June 2006). Even so, as the advertising campaign was not focused on the direct harm of primary cigarette consumption, the potential for bias resulting from confounding is likely minimal. Fourth, Malaysia began to roll-out a graphic warning label policy just prior to wave 4 data collection (which encompasses the follow-up period of wave-pair 3). It is possible that this may have introduced some bias, though it is unlikely the policy would have been rolled out at the time of data collection. Fifth, our study does not account for attrition, which was higher in the Malaysian sample than in the Thai sample, although tests of differential drop-out were not significant. In any case, future studies should apply appropriate methods to account for study attrition. Sixth, and finally, this study utilizes country of residence as a proxy for the warning label policy, but does not measure exposure directly.

Taken together, these findings support the implementation of graphic cigarette warning labels in Southeast Asia by reducing youth smoking intention and susceptibility to smoking, and increasing label saliency and cognition of risk. Southeast Asia is home to approximately 600 million smokers, representing a large majority of global tobacco burden. Most smokers begin at early stage of life and persist through adulthood. Malaysia alone has about 5 million smokers, 20% of whom are younger than 18 years old [121]. As such, understanding the impact of graphic cigarette warning labels as a potentially cost-effective and wide-reaching tobacco control policy is critical to preventing initiation and promoting cessation among youth in this vulnerable region. Continued research is needed to prevent the uptake of smoking and ultimately reduce tobacco-related morbidity and mortality, particularly in the face of the continuing influence of the tobacco industry [122, 123].

Table 2.1. Data collection dates and youth sample composition for ITC-SEA surveys in Malaysia and Thailand.

	ITC-SEA Thailand Survey Collection		ITC-SEA Malaysia Survey Collection	
Wave	**Survey Dates**	**Sample Composition**	**Survey Dates**	**Sample Composition**
1	Jan – Mar 2005	1,000 Youth	Jan – Mar 2005	1,008 Youth
2	Aug – Sept 2006	927 Youth	July 2006 – June 2007	777 Youth
3	Jan – Mar 2008	1,096 Youth	Feb – Sept 2008	712 Youth
4	Apr – July 2009	947 Youth	July – Nov 2009	878 Youth
5	Feb – Apr 2011	963 Youth	May 2011 – Apr 2012	928 Youth

Figure 2.1. Timeline of tobacco policies and ITC surveys in Malaysia, 2004 – 2012



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Figure 2.2. Timeline of tobacco policies and ITC surveys in Thailand, 2004 – 2012



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Table 2.2. Sample description: weighted frequencies and percentages by country and smoke status.

		Malaysia			Thailand		
	Variables	**Total (N=906)**	**Smokers[1] (N=50)**	**Nonsmokers[b] (N=856)**	**Total (N=1372)**	**Smokers[a] (N=141)**	**Nonsmokers[b] (N=1231)**
Smoke Status at baseline	Never smoker	718 (79.97%)	11 (21.50%)	707 (83.43%)	1026 (74.81%)	15 (10.89%)	1011 (82.15%)
	Non-smoker	878 (96.63%)	36 (71.90%)	843 (98.41%)	1303 (94.95%)	93 (65.81%)	1210 (98.30%)
	Current smoker	28 (3.07%)	14 (28.01%)	13 (1.59%)	69 (5.05%)	48 (34.19%)	21 (1.70%)
Smoke Status at follow-up	Never smoker	690 (76.5%)	---	690 (81.01%)	946 (69.06%)	---	946 (76.98%)
	Non-smoker	856 (94.44%)	---	856 (100%)	1231 (89.70%)	---	1231 (100%)
	Current smoker	50 (5.56%)	50 (100%)	---	141 (10.30%)	141 (100%)	---
Smoking Intensity (cigarettes per day)	<1 cigarette	---	3 (4.84%)	---	---	4 (2.98%)	---
	1 cigarette	---	2 (3.73%)	---	---	1 (0.75%)	---
	2-5 cigarettes	---	28 (57.49%)	---	---	63 (44.74%)	---
	6-10 cigarettes	---	4 (8.89%)	---	---	42 (30.06%)	---
	11-20 cigarettes	---	8 (17.21%)	---	---	16 (11.16%)	---
	20+ cigarettes	---	4 (7.85%)	---	---	15 (10.32%)	---
Sex	Male	369 (40.70%)	44 (87.34%)	325 (37.97%)	704 (51.27%)	140 (99.34%)	563 (45.76%)
	Female	537 (59.30%)	6 (12.66%)	531 (62.03%)	669 (48.73%)	1 (0.66%)	668 (54.24%)
Religion	Islamic	613 (80.67%)	45 (90.72%)	569 (79.97%)	17 (1.21%)	3 (2.04%)	14 (1.11%)
	Buddhist	32 (4.25%)	2 (3.39%)	31 (4.31%)	1353 (98.59%)	139 (97.96%)	1214 (98.66%)
	Other religion	115 (15.09%)	3 (5.89%)	222 (15.73%)	3 (0.20%)	0 (0.00%)	3 (0.22%)
Ethnicity	Major group	613 (80.67%)	45 (90.72%)	569 (79.97%)	1353 (98.59%)	139 (97.96%)	1214 (98.66%)
	Minor Group	147 (19.34%)	5 (9.28%)	253 (20.04)	20 (1.41%)	3 (2.04%)	17 (1.33%)

[1] Smoked more than 100 cigarettes in their lifetime and smoked at least 1 day in the past 30 days at follow-up

[b]Did not meet criteria for a smoker at follow-up

Mean age (SE)	At baseline	17.26 (0.11)	17.83 (0.23)	17.23 (0.11)	16.52 (0.05)	17.21 (0.18)	16.44 (0.06)
	At follow-up	18.26 (0.11)	18.83 (0.23)	18.23 (0.11)	18.02 (0.05)	18.56 (0.18)	17.95 (0.06)
Legal smoking age	Yes	282 (31.09%)	39 (77.83%)	271 (31.61%)	559 (40.76%)	109 (77.27%)	527 (42.83%)
	No	624 (68.91%)	11 (22.17%)	585 (68.39%)	813 (59.24%)	32 (22.73%)	704 (57.17%)
Peer Smoking	0 close friends	400 (44.46%)	5 (9.13%)	400 (47.03%)	620 (45.18%)	6 (4.43%)	619 (50.25%)
	1 close friends	72 (8.04%)	2 (3.88%)	69 (8.10%)	131 (9.57%)	16 (11.22%)	126 (10.24%)
	2 close friends	144 (15.98%)	6 (12.74%)	136 (16.03%)	199 (14.53)	20 (14.43%)	180 (14.64%)
	3 close friends	105 (11.63%)	6 (11.88%)	99 (11.69%)	166 (12.07%	17 (12.29%)	136 (11.06%)
	4 close friends	59 (6.59%)	1 (2.47%)	56 (6.63%)	85 (6.21%)	21 (14.59%)	60 (4.87%)
	5 close friends	120 (13.30%)	30 (59.91%)	89 (10.52%)	171 (12.44%)	61 (43.04%)	110 (8.94%)
Smoking at home	Never	403 (45.50%)	19 (39.2%)	384 (45.86%)	598 (43.55%)	51 (64.08%)	547 (44.43%)
	Sometimes/ Always	483 (54.50%)	30 (60.8%)	453 (54.14%)	775 (56.45%)	90 (35.92%)	684 (55.57%)
Self-Esteem	High	784 (87.41%)	38 (76.07%)	738 (89.20%)	1150 (83.83%)	95 (67.34%)	1036 (84.40%)
	Low	113 (12.59%)	12 (23.93%)	89 (10.80%)	222 (16.17%)	46 (32.66%)	192 (15.60%)
Rebellious	Yes	412 (46.33%)	13 (26.87%)	463 (55.28%)	974 (71.02%)	22 (15.77%)	375 (30.50%)
	No	477 (53.67%)	37 (73.13%)	375 (44.72%)	397 (28.98%)	119 (84.23%)	855 (69.50%)
Society disapproves	Agree	422 (47.57%)	21 (41.28%)	402 (47.95%)	552 (40.24%)	58 (41.23%)	494 (40.12%)
of smoking	In-Between	373 (42.02%)	26 (51.58%)	348 (41.45%)	624 (45.46%)	60 (42.60%)	564 (45.79%)
	Disagree	92 (10.41%)	4 (7.14%)	89 (10.60%)	196 (14.30%)	23 (16.17%)	173 (14.08%)
Future-Oriented	Yes	723 (81.74%)	36 (72.45%)	687 (82.30%)	1029 (75.02%)	104 (73.66%)	925 (75.17%)
	No	162 (18.26%)	14 (27.55%)	148 (17.70%)	343 (24.98%)	37 (26.34%)	306 (24.83%)
Cohort	Recruited wave 1	561 (61.96%)	36 (72.22%)	525 (61.35%)	887 (64.63%)	94 (66.79%)	793 (64.38%)
	Recruited wave 2	236 (26.01%)	7 (14.13%)	229 (26.71%)	304 (22.18%)	28 (19.61%)	277 (22.47%)
	Recruited wave 3	109 (12.03%)	7 (13.64%)	102 (11.94%)	181 (13.19%)	19 (13.59%)	162 (13.15%)
Wave-pair	Wave-pair 2	393 (43.42%)	16 (31.37%)	378 (44.13%)	678 (49.43%)	50 (35.52%)	628 (51.03%)
	Wave-pair 3	513 (56.58%)	34 (68.63%)	478 (55.87%)	694 (50.57%)	91 (64.48%)	603 (48.97%)

Table 2.3. GEE results: smoking intentions and susceptibility among youth in Malaysia (pre-policy) versus Thailand (post-policy)[a]

	Model 1[b] OR (95% CI)		Model 2[c] OR (95% CI)		Model 3[d] OR (95% CI)	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**
Plan to Smoke (non-smokers)	0.99 (0.6, 1.65) (n=885)	0.35 (0.12, 0.97)** (n=1128)	1.05 (0.61, 1.78) (n=874)	0.30 (0.11, 0.82)* (n=1112)	0.71 (0.41, 1.22) (n=871)	0.25 (0.09, 0.72)** (n=1100)
Plan to Smoke (never-smokers)	0.57 (0.23, 1.37) (n=614)	0.35 (0.12, 0.97)** (n=1128)	0.69 (0.29, 1.67) (n=605)	0.30 (0.11, 0.82)* (n=1112)	0.45 (0.19, 1.04) (n=608)	0.25 (0.09, 0.72)** (n=1100)
Plan to Smoke (current smokers)	0.19 (0.08, 0.46)*** (n=184)		0.16 (0.06, 0.42)*** (n=184)		0.17 (0.06, 0.46)*** (n=183)	
Plan to quit (current smokers)	2.68 (1.20, 5.99)* (n=179)		2.75 (1.04, 7.30)* (n=179)		2.96 (1.19, 7.33)* (n=178)	

Susceptible to smoking (non-smokers)	1.06 (0.70, 1.59) (n=886)	0.41 (0.21, 0.79)** (n=1128)	1.02 (0.67, 1.55) (n=875)	0.42 (0.22, 0.77)** (n=1112)	0.95 (0.64, 1.42) (n=872)	0.39 (0.18, 0.83)* (n=1100)
Susceptible to smoking (never-smokers)	1.05 (0.66, 1.68) (n=615)	0.41 (0.21, 0.79)** (n=1128)	1.06 (0.64, 1.76) (n=606)	0.42 (0.22, 0.77)** (n=1112)	0.98 (0.59, 1.61) (n=609)	0.39 (0.18, 0.83)* (n=1100)

[a]Malaysia is the reference country

[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discount rate

*p<0.05; **p<0.01; ***p<0.001

Table 2.4. GEE results: Label saliency and cognition of risk among youth in Malaysia (pre-policy) versus Thailand (post-policy)[a]

	Model 1[b] OR (95% CI)		Model 2[c] OR (95% CI)		Model 3[d] OR (95% CI)	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**

Label saliency (non-smokers)	1.50 (1.01, 2.24)* (n=886)	2.04 (1.44, 2.89)*** (n=1128)	1.51 (1.03, 2.21)* (n=874)	2.03 (1.41, 2.91)*** (n=1112)	1.68 (2.13, 2.51)** (n=872)	1.74 (1.24, 2.45)** (n=1100)
Label saliency (never-smokers)	1.90 (1.07, 3.38)* (n=615)	2.04 (1.44, 2.89)*** (n=1128)	1.93 (1.10, 3.38)* (n=606)	2.03 (1.41, 2.91)*** (n=1112)	2.04 (1.16, 3.59)* (n=609)	1.74 (1.24, 2.45)** (n=1100)
Label saliency (current smokers)	2.24 (0.84, 5.99) (n=184)		2.27 (0.73, 7.07) (n=184)		2.28 (0.85, 6.16) (n=183)	
Cognition of risk (non-smokers)	1.00 (0.55, 1.81) (n=869)	3.41 (1.64, 7.11)*** (n=1104)	0.99 (0.54, 1.83) (n=857)	3.57 (1.83, 6.95)*** (n=1089)	1.08 (0.62, 1.87) (n=855)	2.87 (1.35, 6.11)** (n=1078)
Cognition of risk (never-smokers)	0.86 (0.42, 1.74) (n=599)	3.41 (1.64, 7.11)*** (n=1104)	0.84 (0.41, 1.74) (n=591)	3.57 (1.83, 6.95)*** (n=1089)	1.05 (0.51, 2.18) (n=593)	2.87 (1.35, 6.11)** (n=1078)
Cognition of risk (current smokers)	2.13 (0.54, 8.43) (n=180)		Model did not converge		Model did not converge	

[a]Malaysia is the reference country

[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discount rate *p<0.05; **p<0.01; ***p<0.001

Table 2.5. GEE results[a]: preliminary smoking behavioral outcomes for male youth in Thailand (post-policy) versus Malaysia (prepolicy)[b]

	OR (95% CI)	p-value
Smoking Initiation[c]	1.19 (0.71, 2.00)	0.50
High intensity smoking (>10 cigs/day)	0.78 (0.20, 3.04)	0.71
Quit Attempt <1 year[d]	1.66 (0.91, 3.03)	0.09
Increased Smoking Intensity[d]	1.59 (0.58, 4.33)	0.35
Reduced Smoking Intensity[d]	1.42 (0.50, 4.03)	0.50

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Malaysia is the reference country [c]Limited to nonsmokers at baseline [d]Limited to smokers at baseline

Table 2.6.a. Independent effects of covariates on plan to smoke among male non-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.17 (0.08, 0.38)	0.06 (0.03, 0.15)	0.72 (0.19, 2.76)

Country [proxy for graphic label policy]	β_1	0.99 (0.60, 1.65)	1.05 (0.61, 1.78)	0.71 (0.41, 1.22)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	0.89 (0.34, 2.31)	0.98 (0.34, 2.86)	0.90 (0.32, 2.53)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.51 (0.25, 1.03)	0.43 (0.21, 0.90)	0.48 (0.24, 0.98)
Wave-pair [ref = wave-pair 2]	β_4	1.35 (0.73, 2.50)	1.33 (0.70, 2.53)	0.98 (0.49, 1.95)
Demographic variables				
Urban/rural status [ref=rural]	β_5	0.91 (0.52, 1.60)	0.80 (0.43, 1.52)	0.95 (0.53, 1.72)
Legal smoking age [ref=legal]	β_6	0.78 (0.43, 1.41)	0.86 (0.47, 1.57)	0.84 (0.43, 1.66)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	6.19 (2.61, 14.65)***	---
[4 v. 0 (ref)]	β_8	---	5.14 (1.55, 17.11)***	---
[3 v. 0 (ref)]	β_9	---	3.36 (1.34, 8.37)***	---
[2 v. 0 (ref)]	β_{10}	---	2.28 (0.77, 6.75)	---
[1 v. 0 (ref)]	β_{11}	---	2.18 (0.68, 6.97)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	1.14 (0.72, 1.82)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.08 (0.48, 2.43)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.07 (0.69, 1.66)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.61 (0.39, 0.95)*
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.40 (0.20, 0.83)*
Future discount rate (ref= low)	β_{17}	---	---	0.61 (0.39, 0.95)*

[a]Malaysia is the reference country

[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting

*p<0.05; **p<0.01; ***p<0.001

Table 2.6.b. Independent effects of covariates on plan to smoke among male never-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.06 (0.01, 0.22)	0.03 (0.00, 0.20)	0.22 (0.05, 0.91)
Country [proxy for graphic label policy]	β_1	0.57 (0.23, 1.37)	0.69 (0.29, 1.67)	0.45 (0.19, 1.04)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.95 (0.66, 5.71)	2.11 (0.66, 6.77)	1.82 (0.59, 5.64)
[recruited wave 2 v. wave 1 (ref)]	β_3	1.30 (0.52, 3.26)	1.07 (0.40, 2.85)	1.09 (0.49, 2.44)
Wave-pair [ref = wave-pair 2]	β_4	1.16 (0.36, 3.72)	1.15 (0.33, 4.06)	0.75 (0.23, 2.38)
Demographic variables				
Urban/rural status [ref=rural]	β_5	1.63 (0.71, 3.75)	1.26 (0.53, 3.01)	1.50 (0.73, 3.09)
Legal smoking age [ref=legal]	β_6	1.47 (0.66, 3.27)	1.38 (0.62, 3.10)	1.25 (0.58, 2.67)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	1.34 (0.22, 8.12)	---
[4 v. 0 (ref)]	β_8	---	3.13 (0.70, 14.01)	---
[3 v. 0 (ref)]	β_9	---	1.21 (0.31, 4.73)	---
[2 v. 0 (ref)]	β_{10}	---	3.34 (1.15, 9.75)	---
[1 v. 0 (ref)]	β_{11}	---	2.24 (0.75, 6.73)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	1.39 (0.59, 3.29)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	0.73 (0.19, 2.78)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	0.93 (0.52, 1.67)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.54 (0.24, 1.21)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.28 (0.10, 0.78)*
Future discount rate (ref= low)	β_{17}	---	---	1.10 (0.57, 2.13)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.6.c. Independent effects of covariates on plan to smoke among male smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	4.95 (1.69, 14.48)	4.03 (0.59, 27.38)	9.31 (1.83, 47.50)
Country [proxy for graphic label policy]	β_1	0.19 (0.08, 0.46)***	0.16 (0.06, 0.42)***	0.17 (0.06, 0.46)***
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	0.97 (0.18, 5.25)	0.80 (0.17, 3.74)	1.05 (0.19, 5.79)
[recruited wave 2 v. wave 1 (ref)]	β_3	1.23 (0.50, 3.02)	1.19 (0.44, 3.17)	1.26 (0.56, 2.84)
Wave-pair [ref = wave-pair 2]	β_4	1.60 (0.79, 3.23)	1.56 (0.71, 3.39)	1.51 (0.74, 3.09)
Demographic variables				
Urban/rural status [ref=rural]	β_5	0.66 (0.36, 1.23)	0.67 (0.37, 1.21)	0.69 (0.36, 1.32)
Legal smoking age [ref=legal]	β_6	0.73 (0.28, 1.93)	0.69 (0.24, 1.97)	0.76 (0.29, 1.96)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	1.17 (0.22, 6.06)	---
[4 v. 0 (ref)]	β_8	---	1.15 (0.17, 7.81)	---
[3 v. 0 (ref)]	β_9	---	1.93 (0.24, 15.24)	---
[2 v. 0 (ref)]	β_{10}	---	1.03 (0.14, 7.79)	---
[1 v. 0 (ref)]	β_{11}	---	1.58 (0.23, 11.05)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	1.25 (0.67, 2.32)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.69 (0.42, 6.86)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.02 (0.45, 2.34)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.68 (0.31, 1.48)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.67 (0.28, 1.60)
Future discount rate (ref= low)	β_{17}	---	---	0.76 (0.30, 1.92)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.6.d. Independent effects of covariates on plan to smoke among female non- and never-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]

Constant	β_0	0.02 (0.01, 0.09)	0.01 (0.00, 0.05)	0.06 (0.01, 0.65)
Country [proxy for graphic label policy]	β_1	0.35 (0.12, 0.97)*	0.30 (0.11, 0.82)*	0.25 (0.09, 0.72)**
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	0.40 (0.04, 3.65)	0.68 (0.09, 5.34)	0.43 (0.04, 4.67)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.78 (0.29, 2.10)	1.03 (0.34, 3.11)	0.94 (0.36, 2.47)
Wave-pair [ref = wave-pair 2]	β_4	2.22 (0.66, 7.47)	1.78 (0.41, 7.60)	1.58 (0.41, 6.10)
Demographic variables				
Urban/rural status [ref=rural]	β_5	0.55 (0.20, 1.49)	0.70 (0.23, 2.15)	0.45 (0.19, 1.08)
Legal smoking age [ref=legal]	β_6	2.41 (0.79, 7.37)	2.78 (0.88, 8.76)	2.12 (0.79, 5.71)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	8.70 (2.34, 32.33)*	---
[4 v. 0 (ref)]	β_8	---	---	---
[3 v. 0 (ref)]	β_9	---	5.00 (0.78, 32.10)	---
[2 v. 0 (ref)]	β_{10}	---	3.90 (0.81, 18.88)	---
[1 v. 0 (ref)]	β_{11}	---	1.93 (0.38, 9.77)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	1.65 (0.58, 4.67)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	2.57 (0.52, 12.78)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	0.85 (0.21, 3.34)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	1.46 (0.23, 9.15)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.34 (0.09, 1.24)
Future discount rate (ref= low)	β_{17}	---	---	0.54 (0.16, 1.86)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.6.e. Independent effects of covariates on plan to quit among male smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.16 (0.05, 0.50)	0.86 (0.09, 7.99)	0.09 (0.02, 0.49)

Country [proxy for graphic label policy]	β_1	2.68 (1.20, 5.99)*	2.75 (1.04, 7.30)*	2.96 (1.19, 7.33)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.88 (0.45, 7.78)	2.00 (0.50, 7.96)	1.59 (0.32, 7.81)
[recruited wave 2 v. wave 1 (ref)]	β_3	1.84 (0.76, 4.46)	2.38 (0.88, 6.45)	1.97 (0.87, 4.47)
Wave-pair [ref = wave-pair 2]	β_4	0.64 (0.40, 1.03)	0.62 (0.35, 1.08)	0.73 (0.41, 1.29)
Demographic variables				
Urban/rural status [ref=rural]	β_5	1.95 (0.74, 5.15)	2.69 (1.13, 6.43)*	1.62 (0.52, 5.05)
Legal smoking age [ref=legal]	β_6	2.42 (1.03, 5.69)	2.53 (1.11, 5.80)*	2.25 (0.85, 5.92)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	0.17 (0.03, 0.90)	---
[4 v. 0 (ref)]	β_8	---	0.15 (0.02, 1.33)	---
[3 v. 0 (ref)]	β_9	---	0.25 (0.03, 2.38)	---
[2 v. 0 (ref)]	β_{10}	---	0.08 (0.01, 0.61)	---
[1 v. 0 (ref)]	β_{11}	---	0.12 (0.01, 1.81)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.43 (0.20, 0.94)*	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	3.53 (1.18, 10.56)*	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	0.83 (0.28, 2.41)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	2.20 (0.53, 9.23)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.84 (0.36, 1.96)
Future discount rate (ref= low)	β_{17}	---	---	1.01 (0.43, 2.36)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.6.f. Independent effects of covariates on smoking susceptibility among male non-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.62 (0.38, 1.01)	0.30 (0.17, 0.54)	1.69 (0.86, 3.33)
Country [proxy for graphic label policy]	β_1	1.06 (0.70, 1.59)	1.02 (0.67, 1.55)	0.95 (0.64, 1.42)

Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.14 (0.62, 2.10)	1.48 (0.77, 2.86)	1.15 (0.64, 2.05)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.73 (0.47, 1.14)	0.79 (0.51, 1.21)	0.63 (0.42, 0.95)*
Wave-pair [ref = wave-pair 2]	β_4	1.30 (0.94, 1.81)	1.28 (0.87, 1.87)	1.18 (0.83, 1.67)
Demographic variables				
Urban/rural status [ref=rural]	β_5	1.28 (0.88, 1.87)	1.29 (0.90, 1.84)	1.29 (0.89, 1.86)
Legal smoking age [ref=legal]	β_6	1.31 (0.95, 1.79)	1.67 (1.24, 2.24)***	1.24 (0.90, 1.71)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	3.66 (2.05, 6.56)***	---
[4 v. 0 (ref)]	β_8	---	2.97 (1.74, 5.06)	---
[3 v. 0 (ref)]	β_9	---	2.96 (1.86, 4.70)	---
[2 v. 0 (ref)]	β_{10}	---	2.56 (1.68, 3.91)	---
[1 v. 0 (ref)]	β_{11}	---	0.98 (0.62, 1.53)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.91 (0.63, 1.32)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.01 (0.55, 1.86)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.17 (0.84, 1.64)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.47 (0.32, 0.70)***
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.82 (0.60, 1.11)
Future discount rate (ref= low)	β_{17}	---	---	0.86 (0.62, 1.18)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.6.g. Independent effects of covariates on smoking susceptibility among male never-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.36 (0.18, 0.73)	0.22 (0.10, 0.50)	0.64 (0.18, 2.36)
Country [proxy for graphic label policy]	β_1	1.05 (0.6, 1.68)	1.06 (0.64, 1.76)	0.98 (0.59, 1.61)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.57 (0.73, 3.34)	2.00 (0.86, 4.64)	1.48 (0.68, 3.23)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.90 (0.52, 1.55)	0.91 (0.53, 1.56)	0.84 (0.48, 1.47)

Wave-pair [ref = wave-pair 2]	β_4	1.00 (0.66, 1.49)	0.98 (0.63, 1.52)	1.00 (0.62, 1.60)
Demographic variables				
Urban/rural status [ref=rural]	β_5	1.40 (0.85, 2.32)	1.37 (0.79, 2.35)	1.38 (0.83, 2.30)
Legal smoking age [ref=legal]	β_6	1.98 (1.30, 3.02)*	2.27 (1.55, 3.32)	1.89 (1.24, 2.88)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	1.80 (0.90, 3.60)	---
[4 v. 0 (ref)]	β_8	---	2.23 (0.88, 5.64)	---
[3 v. 0 (ref)]	β_9	---	2.19 (1.24, 3.88)**	---
[2 v. 0 (ref)]	β_{10}	---	2.31 (1.23, 4.34)**	---
[1 v. 0 (ref)]	β_{11}	---	1.02 (0.60, 1.64)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.93 (0.56, 1.55)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	0.96 (0.61, 1.49)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.20 (0.86, 1.68)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.63 (0.32, 1.23)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.99 (0.65, 1.51)
Future discount rate (ref= low)	β_{17}	---	---	0.90 (0.55, 1.47)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.6.h. Independent effects of covariates on smoking susceptibility among female non- and never-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.23 (0.12, 0.46)	0.18 (0.07, 0.44)	0.29 (0.06, 1.54)
Country [proxy for graphic label policy]	β_1	0.41 (0.21, 0.79)**	0.42 (0.22, 0.77)**	0.39 (0.18, 0.83)*
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	0.29 (0.11, 0.77)**	0.31 (0.12, 0.78)*	0.27 (0.10, 0.74)**
[recruited wave 2 v. wave 1 (ref)]	β_3	0.79 (0.48, 1.29)	0.88 (0.54, 1.44)	0.86 (0.54, 1.37)
Wave-pair [ref = wave-pair 2]	β_4	1.50 (0.82, 2.74)	1.63 (0.84, 3.18)*	1.56 (0.83, 2.92)

Demographic variables				
Urban/rural status [ref=rural]	β_5	0.54 (0.32, 0.91)*	0.55 (0.32, 0.93)	0.55 (0.32, 0.94)*
Legal smoking age [ref=legal]	β_6	1.25 (0.73, 2.11)	1.29 (0.76, 2.20)	1.23 (0.72, 2.09)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	2.13 (0.77, 5.84)	---
[4 v. 0 (ref)]	β_8	---	0.80 (0.07, 9.50)	---
[3 v. 0 (ref)]	β_9	---	1.89 (0.68, 5.24)	---
[2 v. 0 (ref)]	β_{10}	---	2.26 (1.13, 4.54)	---
[1 v. 0 (ref)]	β_{11}	---	1.22 (0.43, 3.46)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.90 (0.54, 1.51)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.54 (0.78, 3.04)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.00 (0.60, 1.66)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.95 (0.44, 2.04)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	1.08 (0.57, 2.03)
Future discount rate (ref= low)	β_{17}	---	---	0.78 (0.40, 1.55)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.7.a. Independent effects of covariates on label salience among male non-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.39 (0.23, 0.66)	0.34 (0.19, 0.61)	0.42 (0.21, 0.84)
Country [proxy for graphic label policy]	β_1	1.50 (1.01, 2.24)*	1.51 (1.03, 2.21)*	1.68 (1.13, 2.51)**
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.11 (0.53, 2.35)	1.21 (0.55, 2.63)	1.13 (0.56, 2.28)
[recruited wave 2 v. wave 1 (ref)]	β_3	1.14 (0.72, 1.80)	1.27 (0.81, 1.99)	1.02 (0.65, 1.60)
Wave-pair [ref = wave-pair 2]	β_4	1.36 (0.98, 1.90)	1.39 (0.96, 2.01)	1.50 (1.03, 2.17)*
Demographic variables				

Urban/rural status [ref=rural]	β_5	1.32 (0.91, 1.92)	1.36 (0.95, 1.96)	1.27 (0.89, 1.82)
Legal smoking age [ref=legal]	β_6	1.16 (0.81, 1.66)	1.27 (0.88, 1.82)	1.16 (0.81, 1.67)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	2.14 (1.20, 3.81)***	---
[4 v. 0 (ref)]	β_8	---	2.19 (1.07, 4.47)***	---
[3 v. 0 (ref)]	β_9	---	1.34 (0.78, 2.29)	---
[2 v. 0 (ref)]	β_{10}	---	1.01 (0.57, 1.78)	---
[1 v. 0 (ref)]	β_{11}	---	0.95 (0.55, 1.63)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.73 (0.52, 1.04)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.05 (0.71, 1.54)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.04 (0.63, 1.70)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.65 (0.42, 1.00)*
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	1.36 (0.95, 1.97)
Future discount rate (ref= low)	$\hat{\alpha}_{17}$	---	---	1.18 (0.83, 1.66)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.7.b. Independent effects of covariates on label salience among male never-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.31 (0.17, 0.57)	0.31 (0.15, 0.63)	0.23 (0.09, 0.55)
Country [proxy for graphic label policy]	β_1	1.90 (1.07, 3.38)*	1.93 (1.10, 3.38)*	2.04 (1.16, 3.59)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.55 (0.68, 3.50)	1.55 (0.68, 3.54)	1.51 (0.69, 3.32)
[recruited wave 2 v. wave 1 (ref)]	β_3	1.04 (0.68, 1.59)	1.10 (0.70, 1.73)	1.05 (0.67, 1.63)
Wave-pair [ref = wave-pair 2]	β_4	1.29 (0.81, 2.06)	1.37 (0.84, 2.25)	1.46 (0.87, 2.45)
Demographic variables				

Urban/rural status [ref=rural]	β_5	1.21 (0.76, 1.91)	1.21 (0.79, 1.87)	1.19 (0.76, 1.85)
Legal smoking age [ref=legal]	β_6	1.14 (0.76, 1.71)	1.17 (0.80, 1.72)	1.15 (0.77, 1.70)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	2.44 (1.13, 5.26)	---
[4 v. 0 (ref)]	β_8	---	1.22 (0.45, 3.33)	---
[3 v. 0 (ref)]	β_9	---	0.85 (0.44, 1.65)	---
[2 v. 0 (ref)]	β_{10}	---	1.34 (0.91, 1.95)	---
[1 v. 0 (ref)]	β_{11}	---	0.99 (0.58, 1.67)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.65 (0.47, 0.89)**	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.03 (0.60, 1.77)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.09 (0.59, 2.01)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	1.04 (0.56, 1.93)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	1.28 (0.80, 2.05)
Future discount rate (ref= low)	β_{17}	---	---	1.14 (0.77, 1.69)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.7.c. Independent effects of covariates on label salience among male smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	1.42 (0.33, 6.04)	0.80 (0.08, 7.60)	1.22 (0.17, 8.72)
Country [proxy for graphic label policy]	β_1	2.24 (0.84, 5.99)	2.27 (0.73, 7.07)	2.28 (0.85, 6.16)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	4.51 (1.01, 20.22)*	5.89 (1.01, 34.19)	4.35 (0.87, 21.73)
[recruited wave 2 v. wave 1 (ref)]	β_3	2.72 (0.56, 13.16)	2.60 (0.48, 14.14)	2.67 (0.50, 14.21)
Wave-pair [ref = wave-pair 2]	β_4	2.05 (0.76, 5.54)	2.27 (0.83, 6.16)	2.05 (0.74, 5.70)
Demographic variables				
Urban/rural status [ref=rural]	β_5	0.82 (0.26, 2.58)	0.83 (0.25, 2.79)	0.84 (0.28, 2.52)
Legal smoking age [ref=legal]	β_6	1.93 (0.42, 8.90)	3.00 (0.61, 14.68)	1.88 (0.40, 8.86)

Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	2.09 (0.29, 14.97)	---
[4 v. 0 (ref)]	β_8	---	1.70 (0.32, 8.98)	---
[3 v. 0 (ref)]	β_9	---	1.65 (0.30, 9.04)	---
[2 v. 0 (ref)]	β_{10}	---	1.83 (0.30, 11.17)	---
[1 v. 0 (ref)]	β_{11}	---	1.00 (0.18, 5.44)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.38 (0.11, 1.29)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.62 (0.30, 8.70)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.54 (0.58, 4.07)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.92 (0.27, 3.13)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	1.45 (0.47, 4.52)
Future discount rate (ref= low)	β_{17}	---	---	1.18 (0.42, 3.33)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.7.d. Independent effects of covariates on label salience among female non- and never-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.58 (0.36, 0.94)	0.63 (0.37, 1.05)	0.90 (0.40, 2.00)
Country [proxy for graphic label policy]	β_1	2.04 (1.44, 2.89)***	2.03 (1.41, 2.91)***	1.74 (1.24, 2.45)**
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.86 (0.74, 4.69)	1.77 (0.78, 4.04)	1.86 (0.71, 4.84)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.82 (0.47, 1.42)	0.86 (0.48, 1.51)	0.87 (0.51, 1.50)
Wave-pair [ref = wave-pair 2]	β_4	1.17 (0.88, 1.56)	1.33 (0.97, 1.83)	1.06 (0.77, 1.45)
Demographic variables				
Urban/rural status [ref=rural]	β_5	0.68 (0.47, 0.97)*	0.64 (0.44, 0.94)*	0.69 (0.47, 1.00)
Legal smoking age [ref=legal]	β_6	0.75 (0.54, 1.06)	0.75 (0.55, 1.03)	0.74 (0.52, 1.06)
Social/normative variables				

Peer smoking [5 v. 0 (ref)]	β_7	---	1.01 (0.44, 2.32)	---
[4 v. 0 (ref)]	β_8	---	1.43 (0.25, 8.36)	---
[3 v. 0 (ref)]	β_9	---	1.16 (0.62, 2.17)	---
[2 v. 0 (ref)]	β_{10}	---	0.81 (0.35, 1.88)	---
[1 v. 0 (ref)]	β_{11}	---	1.14 (0.63, 2.04)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.59 (0.41, 0.85)**	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.07 (0.63, 1.83)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.26 (0.87, 1.84)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.98 (0.61, 1.57)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.73 (0.53, 1.00)*
Future discount rate (ref= low)	β_{17}	---	---	0.87 (0.57, 1.33)

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.7.e. Independent effects of covariates on risk cognition among male non-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	9.31 (4.53, 19.16)	12.11 (3.96, 37.01)	4.82 (1.23, 18.96)
Country [proxy for graphic label policy]	β_1	1.00 (0.55, 1.81)	0.99 (0.54, 1.83)	1.08 (0.62, 1.87)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	0.41 (0.12, 1.39)	0.38 (0.11, 1.35)	0.39 (0.11, 1.37)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.96 (0.49, 1.90)	0.99 (0.45, 2.14)	1.00 (0.53, 1.88)
Wave-pair [ref = wave-pair 2]	β_4	2.30 (1.07, 4.97)*	2.45 (1.07, 5.63)	2.40 (0.98, 5.89)*
Demographic variables				
Urban/rural status [ref=rural]	β_5	1.03 (0.55, 1.92)	1.09 (0.58, 2.04)	1.07 (0.57, 2.02)
Legal smoking age [ref=legal]	β_6	0.86 (0.56, 1.31)	0.79 (0.49, 1.28)	0.85 (0.53, 1.34)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_7	---	1.47 (0.55, 3.96)	---

[4 v. 0 (ref)]	β_8	---	0.97 (0.38, 2.51)	---
[3 v. 0 (ref)]	β_9	---	0.45 (0.15, 1.33)	---
[2 v. 0 (ref)]	β_{10}	---	0.83 (0.40, 1.70)	---
[1 v. 0 (ref)]	β_{11}	---	0.50 (023, 1.07)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.88 (0.51, 1.51)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.05 (0.46, 2.43)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.12 (0.53, 2.38)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	1.10 (0.51, 2.37)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.92 (0.43, 1.98)
Future discount rate (ref= low)	β_{17}	---	---	2.27 (1.20, 4.32)*

[a]Malaysia is the reference country

[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting

*p<0.05; **p<0.01; ***p<0.001

Table 2.7.f. Independent effects of covariates on risk cognition among male never-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	11.98 (5.23, 27.47)	23.62 (8.78, 63.56)	2.81 (0.55, 14.36
Country [proxy for graphic label policy]	β_1	0.86 (0.42, 1.74)	0.84 (0.41, 1.74)	1.05 (0.51, 2.18)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	0.72 (0.19, 2.64)	0.69 (0.19, 2.44)	0.83 (0.20, 3.53)
[recruited wave 2 v. wave 1 (ref)]	β_3	1.21 (0.61, 2.43)	1.40 (0.70, 2.79)	1.48 (0.79, 2.78)
Wave-pair [ref = wave-pair 2]	β_4	2.23 (0.84, 5.96)	2.16 (0.81, 5.75)	2.05 (0.70, 5.99)
Demographic variables				
Urban/rural status [ref=rural]	β_5	0.89 (0.40, 1.98)	0.82 (0.36, 1.85)	0.90 (0.38, 2.13)
Legal smoking age [ref=legal]	β_6	0.65 (0.37, 1.14)	0.53 (0.28, 1.02)	0.69 (0.39, 1.24)
Social/normative variables				

Peer smoking [5 v. 0 (ref)]	β_7	---	2.27 (0.31, 16.55)	---
[4 v. 0 (ref)]	β_8	---	4.98 (0.14, 180.32)	---
[3 v. 0 (ref)]	β_9	---	0.22 (0.07, 0.64)	---
[2 v. 0 (ref)]	$\hat{\beta}_{10}$	---	1.13 (0.46, 2.80)	---
[1 v. 0 (ref)]	β_{11}	---	0.78 (0.32, 1.91)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.65 (0.34, 1.24)	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	0.48 (0.19, 1.21)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.08 (0.30, 2.98)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	1.98 (0.78, 4.98)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	1.02 (0.40, 2.61)
Future discount rate (ref= low)	β_{17}	---	---	2.76 (1.33, 5.75)**

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.7.g. Independent effects of covariates on risk cognition among male smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	15.71 (1.79, 137.74)	Model did not converge	Model did not converge
Country [proxy for graphic label policy]	β_1	2.13 (0.54, 8.43)	Model did not converge	Model did not converge
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2 $\hat{\beta}_3$	0.26 (0.01, 4.94)	Model did not converge	Model did not converge
[recruited wave 2 v. wave 1 (ref)]		2.51 (0.17, 36.48)	Model did not converge	Model did not converge
Wave-pair [ref = wave-pair 2]	β_4	0.73 (0.02, 24.47)	Model did not converge	Model did not converge
Demographic variables				
Urban/rural status [ref=rural]	β_5	0.80 (0.12, 5.31)	Model did not converge	Model did not converge
Legal smoking age [ref=legal]	β_6	---	Model did not converge	Model did not converge

Social/normative variables				
Peer smoking [5 v. 0 (ref)]	$\hat{\beta}_7$	---	Model did not converge	---
[4 v. 0 (ref)]	β_8	---	Model did not converge	---
[3 v. 0 (ref)]	β_9	---	Model did not converge	---
[2 v. 0 (ref)]	$\hat{\hat{a}}_{10}$	---	Model did not converge	---
[1 v. 0 (ref)]	β_{11}	---	Model did not converge	---
Smoking at home (ref = sometimes/often)	β_{12}	---	Model did not converge	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	Model did not converge	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	Model did not converge	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	Model did not converge
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	Model did not converge
Future discount rate (ref= low)	β_{17}	---	---	Model did not converge

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 2.7.h. Independent effects of covariates on risk cognition among female non- and never-smokers[a]

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	4.20 (1.93, 9.16)	6.61 (3.18, 13.72)	14.83 (2.53, 86.99)
Country [proxy for graphic label policy]	β_1	3.41 (1.64, 7.11)***	3.57 (1.83, 6.95)***	2.87 (1.35, 6.11)**
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	7.27 (1.28, 41.40)	5.70 (1.10, 29.66)	7.63 (1.03, 56.49)
[recruited wave 2 v. wave 1 (ref)]	β_3	1.40 (0.70, 2.80)	1.34 (0.68, 2.66)	1.10 (0.53, 2.28)
Demographic variables				
Wave-pair [ref = wave-pair 2]	β_4	1.19 (0.53, 2.67)	1.29 (0.53, 3.10)	0.94 (0.41, 2.17)
Urban/rural status [ref=rural]	β_5	2.50 (1.25, 5.01)**	1.97 (0.97, 3.99)	2.33 (1.09, 5.00)
Legal smoking age [ref=legal]	β_6	1.18 (0.55, 2.52)	1.11 (0.51, 2.40)	0.47 (0.23, 0.97)
Social/normative variables				

Peer smoking [5 v. 0 (ref)]	β_7	---	0.40 (0.09, 1.74)	---
[4 v. 0 (ref)]	β_8	---	---	---
[3 v. 0 (ref)]	β_9	---	3.00 (0.60, 14.92)	---
[2 v. 0 (ref)]	β_{10}	---	4.20 (0.89, 19.92)	---
[1 v. 0 (ref)]	β_{11}	---	0.42 (0.10, 1.86)	---
Smoking at home (ref = sometimes/often)	β_{12}	---	0.47 (0.22, 1.02)*	---
Society disapproves of smoking [disagree v. agree (ref)]	β_{13}	---	1.09 (0.30, 3.99)	---
[in-between v. agree (ref)]	$\hat{\beta}_{14}$	---	1.12 (0.53, 2.36)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{15}	---	---	0.39 (0.08, 1.82)
Rebelliousness (ref=non-rebellious)	β_{16}	---	---	0.47 (0.23, 0.97)
Future discount rate (ref= low)	β_{17}	---	---	1.42 (0.51, 3.93)

[a]Malaysia is the reference country

[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[d]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting

*p<0.05; **p<0.01; ***p<0.001

Table 2.8.a. Independent effects of covariates on smoking initiation among male youth nonsmokers[ab]

Constant	β_0	0.15 (0.07, 0.31)
Country [proxy for graphic label policy]	β_1	1.19 (0.71, 2.00)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	0.63 (0.27, 1.49)
[recruited wave 2 v. wave 1 (ref)]	$\hat{a}_3$	1.45 (0.83, 2.56)
Wave-pair [ref = wave-pair 2]	β_4	0.74 (0.47, 1.18)
Urban/rural status [ref=rural]	β_5	1.45 (0.84, 2.49)
Legal smoking age [ref=legal]	β_6	1.39 (0.88, 2.20)

[a]Malaysia is the reference country

[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

*p<0.05; **p<0.01; ***p<0.001

Table 2.8.b. Independent effects of covariates on high intensity smoking among male youth nonsmokers[ab]

Constant	β_0	0.87 (0.20, 3.84)
Country [proxy for graphic label policy]	β_1	0.78 (0.20, 3.04)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.36 (0.23, 7.87)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.67 (0.21, 2.09)
Wave-pair [ref = wave-pair 2]	β_4	0.69 (0.31, 1.51)
Urban/rural status [ref=rural]	β_5	0.48 (0.14, 1.62)
Legal smoking age [ref=legal]	β_6	0.45 (0.14, 1.43)

[a]Malaysia is the reference country

[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

*p<0.05; **p<0.01; ***p<0.001

Table 2.8.c. Independent effects of covariates on quit attempt among male youth non-smokers[ab]

Constant	β_0	0.66 (0.27, 1.59)
Country [proxy for graphic label policy]	β_1	1.66 (0.91, 3.03)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	2.34 (0.70, 7.86)
[recruited wave 2 v. wave 1 (ref)]	β_3	2.14 (0.66, 6.90)
Wave-pair [ref = wave-pair 2]	β_4	0.44 (0.23, 0.83)**
Urban/rural status [ref=rural]	β_5	2.37 (1.14, 4.93)*
Legal smoking age [ref=legal]	β_6	1.01 (0.38, 2.69)

[a]Malaysia is the reference country

[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

*p<0.05; **p<0.01; ***p<0.001

Table 2.8.d. Independent effects of covariates on increased smoking intensity among male youth non-smokers[ab]

Constant	β_0	1.05 (0.34, 3.31)
Country [proxy for graphic label policy]	β_1	1.59 (0.58, 4.33)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	1.31 (0.43, 4.01)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.41 (0.16, 1.08)
Wave-pair [ref = wave-pair 2]	β_4	0.61 (0.31, 1.19)
Urban/rural status [ref=rural]	β_5	1.40 (0.56, 3.53)
Legal smoking age [ref=legal]	β_6	0.35 (0.12, 1.00)*

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
*p<0.05; **p<0.01; ***p<0.001

Table 2.8.e. Independent effects of covariates on reduced smoking intensity among male youth non-smokers[ab]

Constant	β_0	0.88 (0.28, 2.79)
Country [proxy for graphic label policy]	β_1	1.42 (0.50, 4.03)
Cohort [recruited wave 3 v. wave 1 (ref)]	β_2	0.85 (0.31, 2.30)
[recruited wave 2 v. wave 1 (ref)]	β_3	0.31 (0.14, 0.72)*
Wave-pair [ref = wave-pair 2]	β_4	0.83 (0.44, 1.56)
Urban/rural status [ref=rural]	β_5	0.95 (0.44, 2.08)
Legal smoking age [ref=legal]	β_6	0.28 (0.09, 0.85)*

[a]Malaysia is the reference country
[b]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
*p<0.05; **p<0.01; ***p<0.001

Chapter 3. Measuring the Effect of Warning Label Risk Cognition on Youth Smoking Intention and Behavioral Outcomes in Malaysia and Thailand: Results from International Tobacco Control Project

3.1. Introduction

It is estimated that nearly 80% of the more than one billion smokers worldwide live in low- and middle-income countries [79, 124, 125], with approximately 500 million smokers living in Asia alone [126]. Projections suggest that the number of smokers will increase significantly over the coming decades, as the tobacco industry shifts its markets to this region in response to the shrinking markets in the developed Western countries [127-129]. Whereas smoking has declined in developed countries as a result of extensive tobacco control efforts, including taxation, anti-smoking advertisements, media campaigns, and warning labels on cigarette packs [130], there has been less progress toward reducing smoking in developing countries, with some developing nations' showing increases in tobacco production and use [130]. If current smoking trends continue, estimates suggest that tobacco use will be attributable for roughly 10 million deaths each year by 2020; 70 percent of these deaths will take place in developing countries [130]. As such, there is an urgent need for more research to guide support tobacco control efforts in this region. Achieving greater progress in tobacco control may require focusing on strategies that are less expensive to implement and are thus more feasible for countries with fewer resources.

The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) obligates the implementation of broad comprehensive tobacco control policies, which include the placement of rotating health warnings on tobacco packaging. Warnings must minimally cover 30% of tobacco packaging, but ideally cover more than 50% of the front and back of cigarette packages. Strong health warnings on cigarette packaging are a cost-effective educational strategy, as the only cost is that of implementing the policy [124]. Warning labels can be particularly effective as smokers are potentially exposed to the messages every time they wish to buy or smoke a cigarettes [81]. Warning labels have been shown to increase smoking-related health knowledge [131, 132] and cognitive processing [99] which are positively associated with quit intentions [17]. This article examines whether *graphic* cigarette warning labels effectively reduce smoking intentions, smoking susceptibility, and smoking behaviors among youth in two Southeast Asian countries: Malaysia and Thailand.

3.1.1. History of Tobacco Policies in Malaysia and Thailand

Although tobacco use is universal, social norms and cultural values shape people's smokingrelated attitudes, beliefs, and behavior [133, 134]. While Malaysia and Thailand are both Southeast Asian countries, they are culturally quite different. Thailand is dominated by Buddhist Thais whereas Malaysia is more multi-cultural, dominated by Muslim Malays, but with large minorities of Chinese and Indians.

Differences also exist in the two countries' historical approach to the tobacco epidemic [135]. Thailand is a leader in fighting the tobacco epidemic in the region, and has, for several years, been compliant with most requirements of the World Health Organization Framework Convention on Tobacco Control. Thailand was also one of the first countries to introduce comprehensive *policies* including bans on cigarette advertisements, bans on smoking in most public places, and bans on cigarette buying by Thai adolescents less than 18 years of age. The Thai government moreover introduced requirements in March 2005 for all cigarette packs to include graphic images that depict the ill effects of tobacco on health. With regard to smoking prevalence, a total of 11.7% of Thai youth (aged 14 years and below) reported smoking cigarettes in 2009. Large gender disparities, however, exist among smokers, with 20.1% of boys and 3.8% of girls reporting smoking [81].

In contrast, Malaysia has historically implemented few comprehensive tobacco control *policies*. Nevertheless, the Malaysian government launched a comprehensive national anti-smoking media *campaign* called *Tak Nak* (Say No) in February 2004, a year before our baseline survey. The objective of *Tak Nak* campaign was to reduce the number of smokers, particularly among adolescents, by providing them with accurate information to increase their awareness of, and knowledge about, the danger of smoking through posters, billboards, magazines and newspapers, radio, and television air time [136]. More recently, Malaysia has made significant strides in tobacco control *policy* including the implementation of graphic warning labels in January 2009. Despite recent efforts, smoking prevalence among Malaysian youth remains high. The 2009 Global Youth Tobacco Survey found that 19.5% of 13 to 15-year-olds use some form of tobacco products with 18.2% smoking cigarettes and 9.5% using other tobacco products. Gender disparities found among Thai youth are also apparent in Malaysia; among the

18.2% of Malaysian youth who smoked cigarettes in 2009, 30.9% of boys and 5.3% of girls reported being current smokers [81]. Findings from a recent population-based study indicate that among Thai and Malaysian youth not classified as smokers, approximately 11% (18% males and 3.4% females) and 12% (21% males and 2.6% females) are still experimenting with smoking, respectively [83].

3.1.2. Female Youth Smoking

Although smoking prevalence among Asian women in this region is typically low [136-138], some limited data suggest that smoking may be on the rise among young women [90, 91, 137]. The increased smoking among women could reflect either the shift towards modernization and emancipation of women in this region or the specific targeting of women by the tobacco industry as a huge untapped market for its products, or both [136, 137, 139]. A study using adolescent data from the first wave of the International Tobacco Control Southeast Asia (ITC-SEA) survey showed that female adolescents were less likely to hold positive aesthetic and social acceptability beliefs about smoking compared with their male counterparts, that Thai adolescents were more likely to endorse these beliefs, and that these beliefs were strongly predictive of smoking susceptibility [91]. Past research conducted mainly in Western developed countries suggests that the implementation of anti-smoking campaigns and advertisements may prevent smoking uptake among adolescents [127]. Specifically, previous studies have found that antismoking campaigns can have a significantly positive effect on the public's health knowledge which, in turn, may reduce smoking uptake [128].

3.1.3. Graphic Cigarette Warning Labels

According to the Southeast Asia Tobacco Control Alliance (SEATCA), while many tobacco users generally know that tobacco use is harmful, research has shown that most are unaware of the true risks, even in countries in which there has been a great deal of publicity about the health hazards of tobacco [140].

Adolescents, in particular, do not accurately understand the risks associated with smoking. Although youth "know" that smoking causes lung cancer, they demonstrate a lack of understanding of the magnitude of harm smoking causes [141-146]. For example, youth who smoke believe that

smokingrelated negative consequences are less likely to occur compared with youths who do not smoke [141,

143]. Youth also underestimate the extent to which smoking can shorten one's lifespan [142]. Moreover, adolescents incorrectly believe that health risks can be mitigated by altering their smoking behaviors, such as smoking light cigarettes instead of regular cigarettes [147]. The empirical literature strongly demonstrates that youth consistently misperceive the harmful and addictive nature of smoking [144, 148].

Even describing adolescent smoking initiation as a "decision" may be inappropriate especially because it is questionable as to whether youth are capable of being "fully or adequately" informed decision-makers [146, 149].

Health warning labels on cigarette and other tobacco product packages as well as all marketing materials, help inform consumers of the dangers of smoking, are an important component of national health education programs, and do not cost the government money to implement [150]. Health warning labels must include rotating messages in the principal languages of the country of implementation, and may include graphic images of the health effects associated with smoking.

Among adults, there is substantial evidence favoring the effectiveness of graphic health warnings [14, 20, 92-99], specifically with regard to intentions to quit, thoughts about health risks, decreased smoking prevalence, and cessation behavior [92, 100, 101]. Canada was the first country to require color graphic cigarette warnings, introducing them in 2000. Canadian research has demonstrated that graphic cigarette warnings are an effective way of communicating the health impacts of smoking [17, 20, 93, 94]. There is evidence that graphic warning labels significantly increase salience (reading and noticing); cognitive processing (i.e., thoughts of harm and quitting); and the behavioral response of forgoing cigarettes [14]. Cognitive processing reflects the extent that information is attended to and elaborated upon, and is suggested to be an important determinant of attitude formation in response to new information [94]. In studies of adult smokers, reading, thinking about, and discussing warning labels are used as indicators of cognitive processing [94, 99, 151]. A study by Hammond et al. found that in-depth processing of the warnings was predictive of making some attempt at cessation over the following three months [94]. Another study by Hammond et al. [36] found that approximately 20% of smokers they

surveyed reported smoking less because of the graphic warning labels. They also found that those who reported more negative emotion in response to the warnings were more likely to have quit or reduced smoking at 3 months follow-up.

Studies have shown that large graphic warning labels on cigarette packages are an important source of health information for smokers and non-smokers [37]. Exposure to graphic labels has been shown to reduce cigarette packet appeal [26], increase health knowledge, awareness and perception of risks associated with smoking [13-15, 17, 20, 94, 95, 100, 102], strengthen intentions to quit [94], encourage quit attempts [13, 20, 26, 100, 102], increase use of quitlines [95], prevent relapse [103], discourage smoking initiation [26, 100, 102] and decrease the odds of being a smoker [20, 101]. Additionally, there is evidence to support a greater cognitive impact of graphic warning labels on smokers with low-educational attainment [16] due to the visual modality of risk communication. As such, we hypothesize that the same may hold true for youth who inherently have a lower level of education than their adult counterparts.

Previous research has been conducted to test mediational models to determine the pathway through which warning labels might impact smoking behavior. Borland, Yong, Wilson, et al. (2009) [14] theorized that warning labels influence individuals by first influencing factors that are most proximal to the policy itself, such as noticing and reading the warning labels, and, as a result, act to influence the extent to which people think about the harms of smoking, which in turn raise their smoking-related health concerns, leading them to forgo smoking [152]. Yong et al. determined that, among smokers, warning labels stimulated thoughts about the risks of smoking (cognition of risk), which raised smoking-related health concerns, ultimately leading to stronger intention to quit and quitting behaviors [152]. The overall framework of the ITC model is that policies have immediate proximal impacts, which subsequently affect more general mediators of smoking behavior [11].

Although the majority of research on graphic cigarette warning labels has shown the policy to be effective, some argue that graphic labels may elicit avoidance, defensiveness, and denial. Ruiter and Kok [28, 29] argued that the evidence in support of the policy is sparse and unconvincing, and find flaws in the current research. Because graphic warnings are more fear-evoking than text-only warnings [153], smokers might employ defensive psychological mechanisms to protect themselves. Erceg-Hurn and

Steed [154] found higher reactance among smokers presented with graphic warnings as compared to the text-only warnings. That is, participants exposed to the graphic warnings felt more irritated, angry, annoyed and aggravated with the warnings than their text-only counterparts [155]. Furthermore, there is some evidence that graphic warnings incite defensiveness in response to fear-arousing information [28, 30, 31]. Experimental research on the effectiveness of graphic warning labels has shown that smokers defended themselves against the fear-inducing content, as they decreased their smoking-related risk perceptions compared to smokers who were not exposed to graphic warning labels [156, 157]. Such maladaptive defensive mechanisms might be the result of cognitive dissonance [155, 158].

3.1.4. Youth Smoking

Leventhal and Cleary [159] originally described smoking as a complex behavior that evolves through several stages. Smoking in adolescence is commonly conceptualized as progressing through a sequence of developmental phases characterized by varying smoking frequency and intensity [160], often culminating in nicotine dependence [161]. Basic definitions of smoking have been summarized as preparation, initial trying, experimentation, regular use, and addictive use [162, 163].

Many factors are implicated in the prevalence of tobacco use in Southeast Asia. Among youth smokers, a triad of family, environment, and individual factors synergistically act to motivate adolescents to smoke. Documented factors include experimentation and peer pressure, easy access and/or lack of restrictive laws, family, smoking, cultural norms, stress and psychological factors, smoking within school environments, and involvement with other high-risk behaviors [121]. In developing countries, such as Malaysia, curiosity, peer pressure, and feeling more matured have been shown to be the key factors responsible for initiation of smoking among youth [164, 165]. In Thailand, significant predisposing factors for adolescent smoking have been shown to be having close friends smoking and having smoking siblings [166, 167]. Other studies have also correlated adolescent smoking with parental smoking status [168, 169]. A study conducted among Indonesian youth found that ignorance of the health risks associated with smoking appears to be the significant determinant of smoking among adolescents, where a majority of the adolescents are unaware of the health risk of smoking whereas others believed health effects will only manifest if cigarettes are smoked for a certain period of time [170].

Research has shown that smokers who report seeing graphic health warnings reported more positive cognitions about smoking than smokers who saw the text-only warnings [155]. Because pack warnings have the capacity to be seen many times per day, they only need to be attended to on a minority of occasions to have effects. Studies have consistently found that reported frequency of avoiding warnings is positively associated with cognitive and behavioral responses that predict subsequent quitting activity [14, 71, 120].

Research on determinants of risk appraisal reveals that affective reactions are powerful sources of information [171, 172]. Warning images that evoke affective reactions to smoking, such as worry about the personal health cost of the habit, should engage the use of this affect heuristic to influence evaluations of the objective risks of smoking [171, 172] and elicit thoughts of smoking abstinence, a reduction in intensity of smoking, and quitting [173, 174]. However, such effects are predicted to be mediated rather than direct. That is, their influence on risk perceptions and beliefs about the hazards of smoking will depend on proximal emotional responses that vary across smokers.

While there have been several studies investigating the effectiveness of graphic cigarette warning label policies among adults in Canada, Australia, and other Western countries, there are few studies conducted in developing countries. Studies on the policy's effectiveness among youth are even more limited, and have mainly been conducted in experimental settings. The goal of our research is therefore to assess the effect of graphic warning labels on youth smoking intention, susceptibility to smoking, and smoking behavior. Our primary predictor variable, risk cognition, serves as a proxy for frequency of exposure, due to the potential correlation between smoking status and exposure to warning labels which may contaminate our analyses of smoking outcomes (e.g., a high intensity smoker will likely have a higher frequency of exposure to the warning labels, thus contaminating analysis of smoking intensity as an outcome). To our knowledge, this is the first study to utilize longitudinal data to conduct analyses of the effect of graphic warning labels on the youth behavioral response to graphic warning labels postimplementation of the graphic warning label policy, as well as the first to utilize data from Malaysia in the post-implementation period of the policy. We hypothesize that visual communication of risk may help

significantly increase the perceived harms of smoking, thus reducing intention to smoke, susceptibility to smoking, and ultimately, smoking behaviors.

3.2. Methods

3.2.1. Data Source

This study utilized nationally representative data from the International Tobacco Control South East Asia (ITC SEA) Project. Details on the conceptual framework of the ITC Project and its methodology have been published elsewhere [11, 12]. Briefly, the ITC SEA Survey is a cohort survey of nationally representative sample of youth and adults in Thailand and Malaysia. Eligible respondents originally included youth smokers and non-smokers (recruitment age 13-17 in Malaysia; age 13-19 in Thailand), adult smokers (age 18+) and adult non-smokers in Malaysia; adult non-smokers in Thailand were not recruited in any waves. As this study examines the youth response, adult subjects were excluded from our sample. Respondents were surveyed using face to-face and phone interviews, and were recruited from households using a stratified multistage sampling design. Survey fieldwork was conducted by trained interviewers in each of the two countries. Youth surveys were all self-reported; youth respondents completed a 30-minute self-administered (i.e., pencil and paper questionnaire). In order to minimize the effects of attrition, the sample was replenished to account for those lost to follow-up using the same sampling procedures at baseline. We limit our analyses to waves 2 through 5 for Thailand, and 4 and 5 for Malaysia to isolate post-policy implementation periods in each country.

In Figures 3.1 and 3.2 we present a timeline of tobacco policies and ITC survey data collection waves in Malaysia and Thailand, respectively. Wave 2 was conducted from August to September in Thailand, approximately 17-18 months after the introduction of graphic warning labels. Wave 3 was conducted from January to March 2008 in Thailand, approximately 11 months after the second round of graphic labels was implemented. Wave 4 was conducted from April to July 2011 in Thailand, approximately 26-29 months after the second round of labels was implemented, and from July to November 2009 in Malaysia approximately 1-5 months after the initial introduction of graphic warnings. Finally, wave 5 was conducted from February to April 2011 in Thailand, approximately 11 to 13 months

after the third round of graphic warnings was introduced, and from May 2011 to April 2012 in Malaysia, approximately 23 – 34 months after the introduction of graphic warning labels.

3.2.2. Measures

3.2.2.1. Primary Outcomes: Behavioral Intentions, Susceptibility, and Smoking Behavior

Behavioral Intentions: Plan to Smoke, Plan to Quit

Youth behavioral intentions were measured by the following variables: **plan to smoke** (measured among non-smokers and current smokers) and **plan to quit** within one month and within six months (among smokers). **Plan to smoke**, a binary variable, was assessed based on participant responses (fourpoint ordinal scale) to the following question: "At any time during the next year do you think you will smoke a cigarette?" The responses "probably yes" and "definitely yes" were coded 1 (i.e., plan to smoke in the following year); the remaining responses (probably no and definitely no) were coded 0 (i.e., no plan to smoke in the following year). **Plan to quit**, among smokers, was also a binary variable. It was assessed based on responses to the following survey question: "Which of the following describe your thoughts about quitting smoking?" Responses comprised: "I plan to quit in the next 30 days [1 month]"; "I plan to quit sometime in the next 6 months"; "I plan to quit, but not in the next 6 months"; and "I do not plan to quit at all". Respondents who reported planning to quit within the next 30 days or 6 months were coded 1; all those who reported not planning to quit were coded 0.

Smoking Susceptibility

Smoking susceptibility, among non-smokers (including former and never-smokers) and neversmokers (including participants who never smoked a cigarette) was a binary variable based on responses to two survey questions, each of whose responses were on a four-point ordinal scale (responses: definitely yes, probably yes, probably not, definitely not). The questions were: 1) "If one of your best friends were to offer you a cigarette, would you smoke it?" and 2) "At any time during the next year, do you think you will smoke a cigarette?" Participants who answered "definitely yes," "probably yes," and "probably not" to either question were coded 1, indicating susceptibility. Otherwise, respondents

were coded 0, suggesting non-susceptibility. The coding scheme for susceptibility was developed by Pierce et al [55], and has been utilized by similar research on youth smoking in Southeast Asia [56].

Smoking Behavior: Initiation, High-Intensity Smoking, Quit Attempt, Increased Intensity, Reduced Intensity

Smoking behavior was measured by 5 separate variables: **smoking initiation** (measured among non-smokers), **high intensity smoking** (among smokers), **quit attempt** (among smokers), **increased smoking intensity** (among smokers), and **reduced smoking intensity** (among smokers). **Smoking initiation**, a binary variable, took the value 1 where non-smokers at the baseline wave report smoking at follow-up. Smokers at follow-up included participants who reported smoking more than 100 cigarettes in their lifetimes and at least one cigarette in the last 30 days. **High intensity smoking**, among smokers, was a binary variable that took the value 1 if respondents reported smoking 10 or more cigarettes per day, and 0 if respondents reported smoking 9 or fewer cigarettes per day. **Quit attempt**, among baseline smokers, was a binary variable that took the value 1 if respondents indicated that they attempted to quit smoking in the last year (responses "in the last month" and "in the last year" combined). Changes in smoking intensity, among smokers, was measured by two binary variables: **increased intensity** and **reduced intensity.** Increased intensity was coded 1 if daily cigarette consumption at follow-up was greater than that at baseline, and 0 otherwise; reduced intensity was coded 1 if baseline consumption was greater than that at follow-up. Intensity at both waves was measured by ordinal, categorical, variables.

3.2.2.2. Independent Variable of Interest: Label Risk Cognition (Frequency of Exposure)

To assess the effect of the graphic warning label policy on smoking behavior, we utilized a measure of cognition of risk, measured by the survey item: "To what extent, if at all, have the health warnings made you think about the health risks of smoking?" Respondents who answered "a lot" were coded 1, indicating high cognition. Participants who answered "a little" or "not at all" were coded 0.

We also tested a variant of this measure. In the alternative measurement, participants who responded "a little" or "a lot" were coded as 1, indicating general cognition of risk; and those who responded "not at all" were coded 0, indicating no cognition of risk. However, due to the small number of respondents in the "no cognition" category, our models did not converge. Moreover, as we had originally

intended to study the effect of frequency of exposure to the graphic warning labels, we fitted models in which our outcome variable captured label saliency (notice), where our measure was the number of times in in the last month participants noticed health warnings on cigarette packages ("never," "once in a while," "often," and "very often"). Contrary to our expectations, the results of these models suggested a positive association between number of cigarettes smoked and frequency of exposure to graphic warning labels. We hypothesize that such a perverse effect arises from the conflation of the dependent and independent variables. (In other words, label saliency (notice), or exposure to graphic warning labels, among highintensity smokers occurs *via* the intensity of their consumption.) As a result, a tautology ensues, which precluded our use of the intended exposure variable, and motivated our search for a substitute measure.

3.2.2.3. Control Variables

The potential set of basic control variables comprise gender (female=1), age (proxied by being of legal smoking age follow-up=1), religion (3 dummy variables: Islam, Buddhism, and other (referent)), ethnicity (majority group vs. minor group (referent)), and urban/rural status (rural=referent). Ethnic minority status and urban/rural status were obtained from the household enumeration, which was completed by an adult informant. Religion and ethnicity were ultimately omitted from GEE analyses, as they were highly correlated with country of residence, as participants from Malaysia are primarily Islamic and Malay, and participants from Thailand predominantly Buddhist and Thai. We also controlled for cohort (the wave in which participants were first recruited into the ITC Project) and wave-pair, which accounts for secular changes.

3.2.2.4. Additional Covariates

A set of additional control variables accounts for cultural/attitudinal, social/normative, and intrapersonal factors. Such factors, derived from the Theory of Triadic Influence (TTI) [58, 59], have been shown to predict adolescent smoking behavior in previous research on youth smoking and other substance abuse [60-64]. Cultural/attitudinal variables encompass the demographic variables previously outlined. Social/normative variables included: **peer smoking, smoking at home, and perceived**

societal norms. **Peer smoking** was assessed by responses to the question: "Of the five closest friends that you spend time with on a regular basis, how many of them are smokers?" Responses 1 through 4 were dummy coded; 0 friends was the referent category. **[No] smoking at home** was measured by the survey item: "During the past 7 days (one week), how often have people smoked inside your home while you were there?" Responses comprised: "never," "sometimes," and "often." Respondents who answered "never" were coded 1; those who offered "sometimes" or "often" were coded 0 (referent). A measure of **perceived societal norms** was constructed based upon level of agreement with the statement: "Society disapproves of smoking." Responses, which were dummy coded, comprised: "agree," "in-between" and "disagree" (referent).

Intrapersonal factors included: **self-esteem, rebelliousness, and future discounting**. **Selfesteem** was a binary variable assessed by the survey item: "Choose one statement below that best describes you in the past two weeks, including today." Respondents who answered "I like myself" were coded 1, indicating high self-esteem. Respondents who answered "I hate myself" or "I do not like myself" were coded 0, suggesting low self-esteem (referent). A binary measure of **rebellion** was assessed by the survey item: "I do things my parents would not want me to do." Respondents who answered "often" were coded 1, indicating rebelliousness. Respondents who answered: "never" or "sometimes" were coded 0, indicating little or no rebelliousness (referent). **Future discounting** was assessed by level of agreement to the statement: "I spend a lot of time thinking about how what I do today will affect my life in the future." Participants who responded "agree" were coded 1, indicating a low discount rate. Respondents who answered "in-between" or "disagree" were coded 0, indicating a high discount rate (referent).

3.2.3. Statistical Analysis

3.2.3.1. Descriptive Analysis

Univariate statistics were used to describe the sample. Results are stratified by country (Malaysia and Thailand), as well as smoke status (non-smokers and smokers). We present frequencies as well as sample proportions displayed as column percentages.

3.2.3.2. Inferential Analysis

We used data from seven years (2006-2012) of the ITC-SEA. The data were arranged in three wave-pairs for Thailand and one wave-pair for Malaysia, in which we combined contiguous baseline and follow-up data.

Wave-pair 1	**Wave-pair 2**	**Wave-pair 3**	**Wave-pair 4**
Wave 1 + Wave 2	Wave 2 + Wave 3	Wave 3 + Wave 4	Wave 4 + Wave 5
TH: Jan 2005 – Sept 2006	TH: Aug 2006 – Mar 2008	TH: Jan 2008 – July 2009	TH: Apr 2009 – Apr 2011
MY: Jan 2005 – June 2007	MY: Aug 2006 – Sept 2008	MY: Feb 2008 – Nov 2009	MY: Jul 2009 – Apr 2012

The 2006-2012 period in Thailand, and 2009-2012 period in Malaysia, reflect a policy environment in which both countries had enacted graphic cigarette warning labels (i.e., existed in post-policy period).

Equation (1) depicts the relationship between our smoking outcomes and cognition of risk.

$$\text{Logit}(P(\text{SMOKING OUTCOME}_{it})) = \beta_0 + \beta_1 \bullet \text{COGNITION OF RISK}_i + \beta_x \bullet X_{i(t-1)} \quad (1)$$

In our model, SMOKING OUTCOMES, which were measured at follow-up (time t), are a function of COGNITION OF RISK (the proxy for frequency of exposure to the graphic warning labels), and a vector of covariates (X), which were lagged to the baseline (t-1) of each data wave-pair. β_0 is the regression constant. We estimated the models with the Generalized Estimating Equations (GEE) technique, which generates population-averaged (marginal) effects of graphic cigarette warning labels on smoking outcomes. GEE is preferable to other techniques (e.g., fixed effects regression) for several major reasons. First, it corrects for intra-subject correlation that arises from repeated-measures data. Second, it estimates population-averaged coefficients directly from observed data without restrictive assumptions about heterogeneity across individuals in the parameters [116]. Third, it accommodates dependent variables of various distributions (e.g., linear, logit, count, etc.) And finally, it permits the overt estimation of regression parameters on time-independent covariates, whose effects on the outcomes may be of interest to the investigator or policymaker.

We fitted separate, gender-stratified, models of the effect of graphic cigarette labeling for each smoking outcome. Most models were country-specific, however, we also estimated a combined-country model in which we controlled for country (Malaysia=referent). In accordance with the Theory of Triadic Influence (TTI), the models were built in a partially hierarchical fashion, wherein we added a theoretically linked set of covariates at each stage in the process, while removing the set that was added in the

previous step. The first, benchmark, model specification included the primary predictor variable, cognition of risk (the proxy for frequency of exposure to the graphic warning labels) (High Cognition=1; Low Cognition=referent) and demographic controls (cultural/attitudinal factors); the second specification added social/normative variables to the initial specification; the third, and final, specification added intrapersonal factors to the first specification, but omitted the social/normative set. All models controlled for wave-pair (i.e., time) and cohort. Only crude, unadjusted models, were fitted for smoking behavior, as an insufficient number of youth smokers precluded model convergence when covariates were controlled. Smoking behavior models were, moreover, estimated only among male youth, due to the low prevalence of smoking among female youth in both Thailand and Malaysia. The decision to stratify is based on documented disparities in smoking across men and women [8, 81, 82]; this decision was further supported by the results of tests of sex differences in our models. In pre-estimation testing, we observed statistically significant ($p>0.0001$) coefficients on country x gender interactions in all model specifications.

Our analyses were conducted using SAS-Callable SUDAAN version 11.0.1 to account for the multistage sampling design and oversampling used in the ITC-SEA Project and the longitudinal nature of the data. Analyses were conducted using unweighted and weighted data for all models, with no significant differences observed between weighted and unweighted analyses. Results are presented for weighted analyses, with standard errors and model coefficients adjusted accordingly. As all outcomes are binary, we generate odds ratios and 95% confidence intervals. The QIC (Quasi-likelihood under the Independence model Criterion) statistic was used for comparing models fit with likelihood-based methods among otherwise equally suitable structures.

3.3. Results

Table 3.1 contains summary statistics, by smoke status, for the country-stratified sample. Approximately 6.81% of the Malaysian sample and 12.41% of the Thai sample reported being current smokers at the final wave of the study frame. With regard to our primary predictor variable, cognition of risk, the proportion of participants with a high cognition of risk was higher among non-smokers (51.29%) versus smokers (35.59%) in Thailand. The proportion of participants with a high cognition of risk was comparable among non-smokers (65.96%) and smokers (65.52%) in Malaysia. However, it should be

noted that since there was only one post-implementation wave-pair utilized for Malaysia, the sample size is small (n=438) relative to Thailand (n=1958), for which three wave-pairs were analyzed. The number of smokers within Malaysia is, therefore, extremely small (n=30), thus limiting analyses among Malaysian youth smokers. Other relevant information may be obtained from Table 3.1.

3.3.1. Format of Multivariable Results/Model Recapitulation

In the following sections, we present gender-stratified results of analyses that investigated the association between cognition of risk (a lot vs. little or no) and our smoking outcomes. The models were estimated separately for participants who indicated being current smokers, non-smokers, and neversmokers. Once more, three models of behavioral intention and susceptibility to smoking were modeled using the Theory of Triadic Influence (TTI) as a framework [58, 59]. Model 1 adjusted for wave-pair, urban/rural status, and being of legal smoking age (cultural/attitudinal). (We should note that country was controlled at this level in the set of models that combine Thailand and Malaysia.) Model 2 built upon model 1 by additionally adjusting for behavioral factors: peer influence, parental influence, and perceived societal norms (social/normative). Model 3 also built upon model 1 by adding adjustment variables for personal factors: self-esteem, rebelliousness, and discount rate (intrapersonal). The majority of models are limited to one, or the other, country. We do, however, combine data from Malaysia and Thailand, in one series of models. Doing so achieves two goals: we increase statistical power to detect differences in our outcomes by cognition of risk categories; and observe the collective effect of graphic warning labels on youth in two Southeast Asian countries.

3.3.2. Plan to Smoke

Outcomes for plan to smoke among Thai-only youth are presented in Table 3.2, and for both Thai and Malaysian youth (collectively, Southeast Asian youth) in Table 3.4. The results of analyses that investigated the association between plan to smoke and cognition of risk were not significant among Thai youth, nor among Southeast Asian youth, generally (Thai and Malaysian youth combined). In neither males nor females, did we observe a statistically significant relationship. Further, the limited number of

never-smokers (n=311) in Malaysia precluded analyses for 'plan to smoke' among this sub-population in our combined analysis of Southeast Asian youth.

3.3.3. Plan to Quit

Outcomes for plan to quit among Thai-only youth are presented in Table 3.2, and for both Thai and Malaysian youth (collectively, Southeast Asian youth) in Table 3.4. The results of analyses that investigated the association between plan to quit and risk cognition were not significant among Thai male youth, the only sub-population for which we were able to conduct analyses, due to limited number of female youth smokers in Thailand, and male or female youth smokers in Malaysia.

3.3.4. Smoking Susceptibility

Outcomes for smoking susceptibility among Thai-only youth are presented in Table 3.2, and for both Thai and Malaysian youth (collectively, Southeast Asian youth) in Table 3.4. Among Thai *male nonsmokers,* the odds of any susceptibility to smoking were approximately 27-28% lower among participants with high cognition of risk ("a lot") than those with low cognition of risk ("a little" or "not at all"). This result

was robust across the 3 model specifications {model 1 (OR=0.72, 95% CI [0.59, 0.88]), model 2 (OR=0.73, 95% CI [0.58, 0.93]), and model 3 (OR=0.72, 95% CI [0.58, 0.88])}. The association between susceptibility to smoking and cognition of risk was not statistically significant among Thai females. The association was also not statistically significant among males or females in the analyses that combined Thai and Malaysian youth, controlling for country.

3.3.5. Behavioral Outcomes

3.3.4.1. Smoking Initiation

Behavioral outcomes for male youth in Thailand are presented in Table 3.4. Our results indicate that the odds of **smoking initiation** were 62-63% lower among participants with high cognition of risk than those with low cognition of risk. This result was robust across the 3 model specifications: {model 1 (OR=0.37, 95% CI [0.11, 0.41]), model 2 (OR=0.37, 95% CI [0.26, 0.54]), and model 3 (OR=0.38, 95% CI

[0.26, 0.56])}. The small number of smokers within Malaysia (n=30) precluded the analysis of behavioral outcomes among Malaysian youth smokers. Not shown, however, are the results of regression analyses of smoking initiation (assessed among baseline non-smokers in Malaysia), controlling for wave-pair, cohort, urban/rural status, and legal smoking age. We found that, among Malaysian male youth smokers, the odds of smoking initiation were reduced by 40% among participants with high cognition of risk than those with low cognition of risk (OR=0.60, p=0.0025).

3.3.4.2. High Intensity Smoking

The odds of being a **high intensity smoker** (>10 cigs) was associated with high cognition of risk across model 1 (OR=3.62, 95% CI [1.33, 9.79]) and model 3 (OR=3.28, 95% CI [1.10, 9.78]); model 2 did not converge.

3.3.4.3. Quit attempt

The odds of making a **quit attempt** within the past year were not significantly different for participants with high cognition versus those with low cognition.

3.3.4.4. Smoking Intensity

The **odds of increasing smoking intensity** between baseline and follow-up was associated with high (versus low) cognition of risk in model 1 (OR=2.89, 95% CI [1.31, 6.37]) and model 3 (OR=3.28, 95% CI [1.43, 7.54]); model 2 did not reach statistical significance. Participants with high cognition of risk had approximately three times the odds of increasing smoking intensity of those with low cognition of risk. The **odds of reducing smoking intensity** between baseline and follow-up waves were significantly higher among participants with high cognition or risk than those with low cognition of risk. This result was robust across the 3 model specifications {model 1 (OR=2.71, 95% CI [1.07, 6.85]), model 2 (OR=3.20, 95% CI [1.08, 8.23]), and model 3 (OR=3.47, 95% CI [1.07, 11.28])}.

3.4. Discussion

This study utilized a two-period follow-up design to examine the relationship between cognition of risk and smoking outcomes after the introduction of graphic cigarette warning labels in Thailand and Malaysia. Our analyses explored associations between cognition of risk and two types of smoking responses: intentions and behavior. Consistent with the notion that high cognition of risk credibly proxies

consideration of the potential harm of smoking that is provoked by examining graphic warning labels, we found that high cognition of risk was associated with decreased odds of susceptibility to smoking, decreased odds of smoking initiation, and increased odds of a reduction in smoking intensity among male youth. Inconsistent with this concept, however, we also found that high cognition of risk was associated with increased odds of being a high intensity smoker (>10 cigarettes/day) and increasing smoking intensity at follow-up among male smokers.

The unanticipated observed association between risk cognition and high intensity smoking and increased intensity may be due, in part, to reverse causality, as heavy smokers are more likely to have experienced smoking-related side effects, and are therefore more likely to have a higher cognition of the risks associated with smoking than non-smokers or lower intensity smokers. Prior research has found a causal relationship between active smoking and respiratory symptoms in children and adolescents, including coughing, phlegm, wheezing, and dyspnea [148]. Furthermore, parental, familial, and peer smoking are known risk factors for youth smoking [175-179], making it more likely that youth smokers have family members and friends who are smokers, thus also increasing their secondhand exposure to the health effects of smoking through social observations. A less likely, albeit plausible, explanation is that there is in fact a "boomerang" effect among a sub-population of male youth smokers. Some previous researchers have documented that exposure to anti-smoking communications can have the unintended consequence of increasing smoking-related intentions [180], leading some to argue against graphic warning label policies [181]. However, the majority of research has failed to detect subgroups for which such boomerang effects can be anticipated [182].

Although not the focus of our study, several demographic and social variables merit note as significant correlates of smoking behavior. Living in Thailand, as compared to Malaysia, was associated with increased odds of *planning to smoke* and *smoking susceptibility* among male youth non-smokers in Southeast Asia. Such a country difference may suggest that the graphic labels may have been more effective in Malaysia than in Thailand. It is possible that the long history of anti-tobacco campaigns and policies in Thailand primed youth to the warning labels, while the novelty of the messages in Malaysia may have increased their impact and effectiveness among youth [13, 151]. In addition to country, time, measured by wave-pair dummies, was associated decreasing odds of *plan to quit* and *quit attempt*

among male smokers in Thailand. Nonetheless, without overt specification of the policy variable, it is unclear whether the observed effect represents a secular smoking trend, which is unrelated to the graphic cigarette labeling policy, or a decaying impact of the policy. In addition, *peer smoking* was associated with several outcomes among relevant subgroups, including *plan to smoke (increased odds), plan to quit (decreased odds), smoking susceptibility (increased odds), and smoking initiation (increased odds).*

Our study adds to the extant literature in the following ways. It is the first investigation of which we are aware to examine the effect of cognition of risk (provoked by graphic cigarette labeling), as an independent variable, in relation to youth smoking outcomes in Southeast Asia. It is moreover the first study of youth smoking in the *post*-policy implementation period in Malaysia. Although the Malaysian sample was too small to permit much statistical inference, we were nonetheless able to combine Malaysian data with Thai youth data to examine effects among Southeast Asian youth collectively. Our research also augments previous investigations of youth *behavioral intentions* by exploring actual smoking behavior. Furthermore, our use of theory-driven, tobacco-specific psychosocial control variables strengthens the design of our models. Lastly, our use of multiple wave-pairs allowed us to generate enough statistical power to stratify by gender, as well as to examine different classifications of smokers separately.

Results from Chapter 2, in which a quasi-experimental approach was utilized—with Malaysia representing the pre-policy period and Thailand representing the post-policy period—revealed significant country differences in smoking intention outcomes, suggesting that graphic warning labels positively influence youth smoking. This study expanded that research by uncovering an association between consideration of smoking labels (cognition of risk) and smoking. We should restate that the original aim of this study was to explore the relationship between smoking outcomes and frequency of exposure to graphic warning labels among Southeast Asian youth. However, as frequency of exposure is directly correlated with smoking behavior—more specifically, higher intensity smokers are more frequently exposed to warning labels than nonsmokers or lower intensity smokers—it was replaced by cognition of risk, a measure uncontaminated by the potential tautology. Previous research conducted among adult smokers supports our substitution of the key independent variable. One study indicated that health warning labels influence behavior primarily through their ability to stimulate thoughts about the risks of

smoking, which in turn help to raise smoking-related health concerns, which reduce intention to smoke [152].

Even so, several limitations should be noted. For example, although research has affirmed the reliability and validity of measuring smoking behaviors through self-report methods, our measure of tobacco use may be prone to downward bias, and therefore understate true smoking behavior [119]. However, measures were taken to reduce bias by having youth complete a written 30-minute selfadministered questionnaire, rather than submit responses via face-to-face or phone interviews. In addition, we do not account for the two rounds of new (refreshed) graphic warning labels introduced in Thailand over the course of our study period. Previous research has found that novelty of design may affect smoking outcomes, perhaps as much, or even more, than the content of the label message [13, 151]. We are also unable to isolate the effect of the graphic warning labels from the effects of peripheral tobacco control efforts that occurred over the course of our study period. Additionally, we do not account for the policy roll-out period, and cannot be certain that the Malaysian graphic warning labels were rolled out entirely before wave 4 of the survey, which was deployed only 1-5 months after the implementation of the policy. As such, more extensive post-implementation data are needed to better understand the longterm effects of the labels on Malaysian youth. Lastly, though our population was replenished at every wave, we do not account for dropout in our analyses. A weighted generalized estimating equation (GEE) approach is typically more appropriate for datasets prone to missing observations, as they extend the traditional GEE approach to better account for dropout, assuming data are missing at random [183].

It is imperative that tobacco control policies be studied in the context of developing countries, such as Thailand and Malaysia, where there still exists a high prevalence of smoking due to the shifting focus of the tobacco companies away from the Western world. Graphic cigarette warning labels appear to effectively reduce smoking initiation and smoking susceptibility among Thai and Malaysian youth nonsmokers, as well as decrease smoking intensity among smokers. Promoting effective modalities of risk communication, such as graphic warning labels, intended to educate and inform people about the dangers of tobacco use is on the forefront of the global public health agenda. Understanding and encouraging strategies aimed at preventing smoking initiation among youth is the most effective way to reduce tobacco-related morbidity and mortality in these populations.

Figure 3.1. Timeline of tobacco policies and ITC surveys in Malaysia, 2004 – 2012



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Figure 3.2. Timeline of tobacco policies and ITC surveys in Thailand, 2004 – 2012.



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Table 3.1. Sample description: weighted frequencies and percentages by country and smoke status

		Malaysia			Thailand		
		Total (N=438)	Smokers[1] (N=30)	Nonsmokers[2] (N=408)	Total (N=1958)	Smokers[4] (N=243)	Nonsmokers[2] (N=1715)
Smoke Status (83.11%) at baseline	Never smokers	343 (78.42%)	4 (13.33%)	339 (83.19%)	1454 (74.28%)	29 (11.89%)	1425
	Current smoker	29 (1.50%)	16 (53.33%)	13 (3.19%)	137 (7.01%)	103 (42.57%)	34 (1.97%)
Puffers 12 (2.72%)	1 (3.33%)	11 (2.67%)	104 (5.32%)	28 (11.62%)	76 (4.43%)		
	Experimenters	48 (10.90%)	9 (30.01%)	39 (9.60%)	247 (12.62%)	75 (30.81%)	172 (10.04%)
Former smokers	6 (1.43%)	0 (0.00%)	6 (1.35%)	15 (0.78%)	8 (3.11%)	8 (0.45%)	Smoke Status
Never smokers	311 (70.96%)	-	311 (76.15%)	1316 (67.25%)	-	1317 (76.77%)	at follow-up
Current smoker 30 (6.81%)	30 (100%)	-	243 (12.41%)	243 (100%)	-		
	Puffers	28 (6.34%)	-	28 (6.81%)	169 (8.64%)	-	169 (9.87%)
	Experimenters	62 (14.09%)	-	62 (15.12%)	206 (10.53%)	-	206 (12.02%)
	Former smokers	8 (1.79%)	-	8 (1.92%)	23 (1.17%)	-	23 (1.34%)
Cognition of Risk	High	284 (65.99%)	19 (65.52%)	265 (65.96%)	944 (49.35%)	84 (35.59%)	860 (51.29%)
	Low	147 (34.01%)	10 (34.83%)	137 (34.04%)	969 (50.65%)	153 (64.61%)	816 (48.71%)
Smoking Intensity[2]	<1 cigarette	-	2 (6.67%)	-	-	1 (0.31%)	-
	1 cigarette	-	1 (3.33%)	-	-	7 (2.82%)	-
	2-5 cigarettes	-	13 (43.33%)	-	-	93 (38.28%)	-
	6-10 cigarettes	-	8 (26.67%)	-	-	87 (35.84%)	-
	11-20 cigarettes	-	6 (20.00%)	-	-	27 (10.99%)	-
	20+ cigarettes	-	0 (0.00%)	-	-	24 (10.04%)	-
Sex	Male	211 (48.14%)	26 (86.67%)	185 (45.31%)	997 (50.92%)	240 (98.66%)	757 (44.16%)
	Female	227 (51.86%)	4 (12.33%)	223 (54.69%)	961 (49.08%)	3 (1.34%)	958 (55.84%)
Religion	Islamic	110 (78.28%)	13 (100%)	97 (75.97%)	21 (1.23%)	3 (1.40%)	18 (1.21%)
	Buddhist	10 (6.95%)	0 (0.00%)	10 (7.69%)	1656 (98.48%)	202 (98.6%)	1454 (98.47%)
	Other religion	20 (14.77%)	0 (0.00%)	20 (16.34%)	5 (0.29%)	0 (0.00%)	5 (0.33%)
Ethnicity	Major group	111 (75.84%)	13 (100%)	98 (73.38%)	1140 (95.21%)	152 (95.87%)	988 (95.11%)

[1] Smoked more than 100 cigarettes in their lifetime and smoked at least 1 day in the past 30 days at follow-up

[4] Did not meet criteria for a smoker at follow-up

[2] Measured at follow-up

	Minor Group	35 (24.16%)	0 (0.00%)	35 (26.62%)	57 (4.79%)	7 (4.13%)	50 (4.89%)
Mean age (SE)	At baseline	17.10 (0.05)	18.73 (0.23)	17.00 (0.05)	17.10 (0.05)	17.76 (0.15)	17.00 (0.05)
	At follow-up	18.44 (0.05)	21.73 (0.23)	18.37 (0.05)	18.44 (0.05)	18.97 (0.13)	18.37 (0.05)
Legal smoking age	Yes	408 (100%)	30 (100%)	438 (100%)	1399 (71.44%)	211 (86.79%)	1188 (69.26%)
	No	0 (0.00%)	0 (0.00%)	0 (00%)	559 (28.56%)	32 (13.21%)	527 (30.74%)
Peer Smoking	0 close friends	159 (36.31)	0 (0.00%)	159 (38.97%)	837 (42.73%)	13 (5.44%)	834 (48.64%)
	1 close friends	45 (10.25%)	1 (3.33%)	44 (10.83%)	191 (9.78%)	18 (7.38%)	184 (10.78%)
	2 close friends	79 (18.06%)	2 (6.67%)	77 (18.87%)	287 (14.68%)	27 (11.25%)	261 (15.20%)
	3 close friends	67 (15.27%)	5 (16.67%)	62 (15.26%)	253 (12.90%)	42 (17.46%)	202 (11.75%)
	4 close friends	21 (4.90)	2 (6.66%)	19 (4.67%)	117 (5.98%)	40 (16.54%)	79 (4.58%)
	5 close friends	67 (15.20%)	20 (66.67%)	47 (11.40%)	273 (13.94%)	102 (41.92%)	155 (9.04%)
Smoking at home	Never	239 (54.59%)	13 (43.33%)	226 (55.46%)	870 (44.44%)	87 (35.77%)	7834 (45.67%)
	Sometimes/ Always	199 (45.41%)	17 (56.67%)	182 (44.54%)	1088 (55.56%)	156 (64.23%)	931 (54.33%)
Self-Esteem	High	388 (88.54%)	13 (43.33%)	365 (89.53%)	1637 (83.76%)	163 (66.98%)	1477 (86.10%)
	Low	50 (11.46%)	17 (56.67%)	43 (10.47%)	317 (16.24%)	80 (33.02%)	238 (13.90%)
Rebellious	Yes	78 (42.15%)	6 (66.67%)	72 (41.16%)	615 (31.44%)	27 (19.08%)	271 (22.03%)
	No	106 (57.85%)	3 (33.33%)	103 (58.84%)	1342 (68.56%)	114 (80.92%)	960 (77.97%)
Society disapproves of smoking	Agree	239 (54.61%)	15 (50.00%)	224 (54.85%)	773 (39.50%)	87 (35.93%)	623 (36.32%)
	In-Between	135 (30.79%)	9 (30.00%)	126 (30.97%)	897 (45.80%)	116 (47.83%)	825 (48.14%)
	Disagree	64 (14.60%)	6 (20.00%)	58 (14.18%)	288 (14.70%)	39 (16.24%)	267 (15.54%)
Future-Oriented	Yes	155 (84.43%)	7 (70.00%)	148 (84.87%)	1477 (75.42%)	91 (64.53%)	950 (77.17%)
	No	29 (15.57%)	3 (30.00%)	26 (15.13%)	481 (24.58%)	50 (35.47%)	281 (22.83%)
Cohort	Recruited wave 1	147 (33.48%)	14 (46.67%)	133 (32.61%)	1198 (61.16%)	159 (65.24%)	1038 (60.58%)
	Recruited wave 2	40 (9.07%)	4 (13.33%)	36 (8.70%)	382 (19.52%)	41 (17.07%)	341 (19.87%)
	Recruited wave 3	67 (15.42%)	2 (6.67%)	65 (15.95%)	311 (15.90%)	40 (16.40%)	272 (15.83%)
	Recruited wave 4	184 (42.04%)	10 (33.33%)	174 (42.75%)	67 (3.42%)	3 (1.29%)	64 (3.72%)
Wave-pair	Wave-pair 2	-	-	-	678 (34.64%)	50 (20.65%)	628 (36.62%)

	Wave-pair 3	-	-	-	694 (35.44%)	91 (37.48%)	603 (35.15%)
	Wave-pair 4	438 (100%)	30 (100%)	408 (100%)	586 (29.93%)	102 (41.87%)	484 (28.24%)

Table 3.2. GEE results: smoking intentions among youth in Thailand by cognition of risk (high cognition v. low cognition [ref])[a]

	Model 1[a] OR (95% CI)		Model 2[b] OR (95% CI)		Model 3[c] OR (95% CI)	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**
Plan to Smoke (non-smokers)[d]	1.05 (0.64, 1.75) (n=731)	0.67 (0.22, 2.09) (n=946)	1.10 (0.65, 1.86) (n=731)	Model does not converge	1.17 (1.72, 1.90) (n=730)	0.74 (0.20, 2.70) (n=945)
Plan to Smoke (current smokers)	1.44 (0.70,2.98) (n=234)		1.84 (1.00, 3.37) (n=234)		1.82 (0.89, 3.71) (n=233)	
Plan to quit <6mo (current smokers)	0.96 (0.53, 1.72) (n=229)		1.11 (0.60, 2.05) (n=229)		0.96 (0.53, 1.73) (n=228)	
Susceptible to smoking (non-smokers)	0.74 (0.59, 0.92)** (n=731)	0.69 (0.34, 1.41) (n=946)	0.70 (0.54, 0.90)** (n=731)	0.67 (0.33, 1.39) (n=945)	0.74 (0.57, 0.95)* (n=730)	0.70 (0.36, 1.37) (n=944)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting

[d]Includes never-smokers, puffers, experimenters, former smokers *p<0.05; **p<0.01; ***p<0.001

Table 3.3. GEE results: smoking intentions among youth in Southeast Asia by cognition of risk (high cognition v. low cognition [ref])[a]

	Model 1[a] OR (95% CI)	Model 2[b] OR (95% CI)	Model 3[c] OR (95% CI)

	Males	Females	Males	Females	Males	Females
Plan to Smoke (non-smokers)[d]	1.02 (0.63, 1.65) (n=911)	0.42 (0.12, 1.45) (n=1167)	1.04 (0.62, 1.75) (n=911)	0.32 (0.09 1.15) (n=1167)	1.16 (0.73, 1.84) (n=807)	0.50 (0.16, 1.60) (n=1167)
Susceptible to smoking (non-smokers)[d]	0.83 (0.65, 1.07) (n=911)	0.68 (0.36, 1.27) (n=1167)	0.82 (0.63, 1.08) (n=911)	0.62 (0.32, 1.21) (n=1167)	0.82 (0.63, 1.07) (n=807)	0.71 (0.37, 1.34) (n=11167)
Susceptible to smoking (never-smokers)	Model does not converge	(0.68, 0.37, 1.25) (n=1084)	Model does not converge	0.65 (0.35, 1.22) (n=1084)	Model does not converge	0.77 (0.37, 1.77) (n=1084)

[a]Models adjusted for wave-pair, cohort, country, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, country, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, country, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting

[d]Includes never-smokers, puffers, experimenters, former smokers

*p<0.05; **p<0.01; ***p<0.001

Table 3.4. GEE results: smoking behavioral outcomes among male youth in Thailand by cognition of risk (high cognition v. low cognition [ref])[a]

	Model 1[a] OR (95% CI)	Model 2[b] OR (95% CI)	Model 3[c] OR (95% CI)
Smoking Initiation[d]	0.37 (0.11, 0.41)***	0.37 (0.26, 0.54)***	0.38 (0.26, 0.56)***
Smoke >10 cigs at follow-up[e]	3.62 (1.33, 9.79)**	Model does not converge	3.28 (1.10, 9.78)*
Quit Attempt <1 year[e]	1.01 (0.52, 1.96)	1.12 (0.47, 2.64)	0.86 (0.47, 1.59)
Increased Smoking Intensity[e]	2.89 (1.31, 6.37)*	2.60 (0.99, 6.84)*	3.28 (1.43, 7.54)**
Reduced Smoking Intensity[e]	2.71 (1.07, 6.85)*	3.20 (1.08, 8.23)	3.47 (1.07, 11.28)*

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting [d]Limited to nonsmokers at baseline [e]Limited to smokers at baseline

*p<0.05; **p<0.01; ***p<0.001

Table 3.5.a. Independent effects of covariates on plan to smoke among male youth non-smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.08 (0.03, 0.23)	0.04 (0.01, 0.14)	0.19 (0.05, 0.76)
Cognition of risk [proxy for frequency of exposure]	β_1	1.05 (0.64, 1.75)	1.10 (0.65, 1.86)	1.17 (1.72, 1.90)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.31 (0.05, 1.90)	0.46 (0.08, 2.67)	0.34 (0.06, 2.06)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.92 (0.72, 5.09)	2.26 (0.82, 6.25)	1.80 (0.60, 5.43)

[recruited wave 2 v. wave 1 (ref)]	β_4	0.45 (0.19, 1.04)	0.46 (0.20, 1.07)	0.42 (0.17, 1.07)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	2.23 (0.75, 6.59)	2.18 (0.68, 6.97)	2.10 (0.72, 6.13)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.52 (0.54, 4.28)	1.47 (0.49, 4.43)	1.27 (0.42, 3.84)
Urban/rural status [ref=rural]	β_7	1.74 (0.86, 3.50)	1.91 (0.94, 3.88)	1.72 (0.85, 3.48)
Legal smoking age [ref=legal]	β_8	0.99 (0.44, 2.20)	1.15 (0.44, 2.98)	0.99 (0.42, 2.35)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	4.75 (2.02, 11.15)**	---
[4 v. 0 (ref)]	β_{10}	---	2.86 (0.90, 9.11)	---
[3 v. 0 (ref)]	β_{11}	---	1.82 (0.81, 4.07)	---
[2 v. 0 (ref)]	β_{12}	---	1.64 (0.71, 3.77)	---
[1 v. 0 (ref)]	$\hat{a}_{13}$	---	1.78 (0.71, 4.44)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	1.10 (0.71, 1.70)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	1.18 (0.63, 2.22)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	0.63 (0.37, 1.08)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	0.64 (0.31, 1.32)
Future discount rate (ref= low)	β_{18}	---	---	0.64 (0.40, 1.04)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.5.b. Independent effects of covariates on plan to smoke among female youth non-smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.04 (0.00, 0.40)	Model does not converge	0.07 (0.01, 0.93)
Cognition of risk [proxy for frequency of exposure]	β_1	0.67 (0.22, 2.09)	Model does not converge	0.74 (0.20, 2.70)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	---	Model does not converge	---
[recruited wave 3 v. wave 1 (ref)]	β_3	0.31 (0.03, 3.47)	Model does not converge	0.29 (0.09, 0.91)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.02 (0.00, 0.26)	Model does not converge	0.02 (0.00, 0.19)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.85 (0.09, 8.02)	Model does not converge	1.00 (0.11, 9.30)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.19 (0.46, 3.10)	Model does not converge	1.71 (0.53, 5.46)
Urban/rural status [ref=rural]	β_7	0.41 (0.11, 1.60)	Model does not converge	0.51 (0.12, 2.13)
Legal smoking age [ref=legal]	β_8	1.08 (0.21, 5.60)	Model does not converge	1.16 (0.24, 5.53)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	Model does not converge	---
[4 v. 0 (ref)]	β_{10}	---	Model does not converge	---
[3 v. 0 (ref)]	β_{11}	---	Model does not converge	---
[2 v. 0 (ref)]	β_{12}	---	Model does not converge	
[1 v. 0 (ref)]	β_{13}	---	Model does not converge	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	Model does not converge	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	Model does not converge	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	0.65 (0.11, 3.72)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	1.39 (0.28, 6.75)
Future discount rate (ref= low)	β_{18}	---	---	0.28 (0.09, 0.92)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.5.c. Independent effects of covariates on plan to smoke among male youth smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.79 (0.32, 1.97)	0.56 (0.09, 3.35)	1.34 (0.30, 5.90)
Cognition of risk [proxy for frequency of exposure]	β_1	1.44 (0.70,2.98)	1.84 (1.00, 3.37)	1.82 (0.89, 3.71)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.50 (0.44, 5.12)	1.19 (0.33, 4.27)	1.02 (0.31, 3.30)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.49 (0.41, 5.50)	1.74 (0.49, 6.24)	1.45 (0.41, 5.19)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.04 (0.46, 2.34)	1.08 (0.43, 2.73)	0.99 (0.43, 2.30)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.69 (0.64, 4.45)	1.43 (0.55, 3.72)	1.71 (0.65, 4.49)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.53 (0.64, 3.68)	1.34 (0.52, 3.46)	1.55 (0.65, 3.68)
Urban/rural status [ref=rural]	β_7	0.63 (0.35, 1.14)	0.59 (0.30, 1.16)	0.62 (0.32, 1.19)
Legal smoking age [ref=legal]	β_8	0.83 (0.26, 2.68)	0.93 (0.27, 3.27)	0.76 (0.24, 2.45)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	1.25 (0.22, 7.06)	---
[4 v. 0 (ref)]	β_{10}	---	1.89 (0.24, 15.11)	---
[3 v. 0 (ref)]	β_{11}	---	2.28 (0.25, 21.10)	---
[2 v. 0 (ref)]	β_{12}	---	0.82 (0.08, 8.09)	---
[1 v. 0 (ref)]	β_{13}	---	0.73 (0.10, 5.35)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	0.83 (0.42, 1.63)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	0.78 (0.38, 1.62)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	0.75 (0.40, 1.43)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	0.45 (0.17, 1.20)
Future discount rate (ref= low)	β_{18}	---	---	0.59 (0.30, 1.17)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.5.d. Independent effects of covariates on plan to quit among male youth smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.78 (0.37, 1.62)	0.76 (0.14, 4.01)	0.73 (0.22, 2.43)
Cognition of risk [proxy for frequency of exposure]	β_1	0.96 (0.53, 1.72)	1.11 (0.60, 2.05)	0.96 (0.53, 1.73)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	---	---	---
[recruited wave 3 v. wave 1 (ref)]	β_3	0.77 (0.22, 2.60)	0.75 (0.19, 3.02)	0.78 (0.23, 2.63)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.43 (0.62, 3.29)	1.41 (0.64, 3.11)	1.41 (0.61, 3.29)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.39 (0.20, 0.75)*	0.34 (0.14, 0.86)*	0.42 (0.19, 0.92)*
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.62 (0.37, 1.05)	0.59 (0.37, 0.96)*	0.68 (0.40, 1.18)
Urban/rural status [ref=rural]	β_7	1.64 (0.76, 3.55)	1.57 (0.72, 3.42)	1.45 (0.59, 3.59)
Legal smoking age [ref=legal]	β_8	1.54 (0.64, 3.69(	1.65 (0.62, 4.44)	1.47 (0.57, 3.78)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	0.84 (0.23, 3.02)	---
[4 v. 0 (ref)]	β_{10}	---	0.67 (0.14, 3.11)	---
[3 v. 0 (ref)]	β_{11}	---	0.97 (0.27, 3.49)	---
[2 v. 0 (ref)]	β_{12}	---	0.75 (0.19, 2.88)	---
[1 v. 0 (ref)]	β_{13}	---	0.76 (0.12, 4.78)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	0.60 (0.31, 1.18)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	0.52 (0.25, 1.10)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	1.44 (0.61, 3.42)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	0.81 (0.45, 1.44)
Future discount rate (ref= low)	β_{18}	---	---	1.01 (0.50, 2.01)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.5.e. Independent effects of covariates on susceptibility to smoke among male youth non-smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.54 (0.35, 0.85)	0.26 (0.15, 0.46)	1.34 (0.62, 2.90)
Cognition of risk [proxy for frequency of exposure]	β_1	0.74 (0.59, 0.92)**	0.70 (0.54, 0.90)**	0.76 (0.59, 0.97)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.25 (0.07, 0.89)	0.50 (0.16, 1.51)	0.26 (0.07, 0.88)
[recruited wave 3 v. wave 1 (ref)]	β_3	2.18 (1.43, 3.33)***	3.34 (2.16, 5.17)***	2.05 (1.28, 3.27)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.92 (0.55, 1.55)	1.02 (0.63, 1.65)	0.87 (0.51, 1.47)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.45 (0.94, 2.23)	1.43 (0.93, 2.21)	1.34 (0.85, 2.10)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.40 (1.05, 1.86)	1.61 (1.28, 2.02)**	1.39 (0.94, 2.07)
Urban/rural status [ref=rural]	β_7	1.58 (1.02, 2.44)	1.63 (1.12, 2.36)**	1.68 (1.06, 2.65)*
Legal smoking age [ref=legal]	β_8	1.37 (0.90, 2.09)	1.82 (1.20, 2.76)	1.29 (0.84, 1.97)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	4.04 (1.86, 8.81)***	---
[4 v. 0 (ref)]	β_{10}	---	2.30 (1.32, 4.00)***	---
[3 v. 0 (ref)]	β_{11}	---	2.68 (1.57, 4.57)***	---
[2 v. 0 (ref)]	β_{12}	---	2.83 (1.68, 4.79)***	---
[1 v. 0 (ref)]	$\hat{\hat{a}}_{13}$	---	1.30 (0.87, 1.94)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	1.00 (0.68, 1.48)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	0.97 (0.68, 1.39)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	0.50 (0.36, 0.70)***
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	0.76 (0.52, 1.09)
Future discount rate (ref= low)	β_{18}	---	---	0.72 (0.53, 0.98)*

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.5.f. Independent effects of covariates on susceptibility to smoke among female youth non-smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.15 (0.04, 0.50)	0.08 (0.02, 0.25)	0.17 (0.03, 0.93)
Cognition of risk [proxy for frequency of exposure]	β_1	0.69 (0.34, 1.41)	0.66 (0.32, 1.34)	0.70 (0.36, 1.37)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.25 (0.08, 0.75)	0.37 (0.12, 1.14)	0.24 (0.07, 0.81)*
[recruited wave 3 v. wave 1 (ref)]	β_3	0.72 (0.39, 1.33)	0.87 (0.53, 1.45)	0.70 (0.38, 1.27)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.53 (0.13, 2.17)	0.61 (0.16, 2.37)	0.57 (0.14, 2.33)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.88 (1.06, 3.35)	1.58 (0.88, 2.84)	2.24 (1.30, 3.87)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.10 (0.66, 1.84)	1.10 (0.63, 1.91)	1.69 (0.95, 3.01)
Urban/rural status [ref=rural]	β_7	0.55 (0.25, 1.19)	0.63 (0.32, 1.24)	0.57 (0.29, 1.10)
Legal smoking age [ref=legal]	β_8	1.45 (0.75, 2.78)	1.49 (0.74, 2.98)	1.46 (0.74, 2.86)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	4.00 (1.44, 11.06)***	---
[4 v. 0 (ref)]	β_{10}	---	3.48 (0.72, 16.70)	---
[3 v. 0 (ref)]	β_{11}	---	2.53 (0.81, 7.87)	---
[2 v. 0 (ref)]	β_{12}	---	2.46 (0.91, 6.71)	---
[1 v. 0 (ref)]	β_{13}	---	2.91 (1.32, 6.42)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	0.94 (0.57, 1.57)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	0.86 (0.45, 1.63)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	0.83 (0.34, 2.02)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	1.87 (1.14, 3.06)**

Future discount rate (ref= low)	β_{18}	---	---	0.79 (0.40, 1.54)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.6.a. Independent effects of covariates on plan to smoke among male youth non-smokers in Southeast Asia

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.04 (0.01, 0.12)	0.01 (0.00, 0.05)	0.22 (0.02, 2.26)
Cognition of risk [proxy for frequency of exposure]	β_1	1.02 (0.63, 1.65)	1.04 (0.63, 1.74)	1.16 (0.73, 1.84)
Country [Thailand v. Malaysia (ref)]	β_2	2.46 (1.12, 5.42)*	3.10 (1.47, 6.52)**	0.76 (0.10, 5.76)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	0.70 (0.23, 2.12)	0.96 (0.31, 2.98)	0.33 (0.06, 1.96)
[recruited wave 3 v. wave 1 (ref)]	β_4	1.72 (0.69, 4.26)	2.00 (0.64, 5.38)	1.81 (0.63, 5.24)
[recruited wave 2 v. wave 1 (ref)]	β_5	0.47 (0.21, 1.06)	0.48 (0.21, 1.07)	0.43 (0.17, 1.06)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	2.14 (0.74, 6.19)	2.07 (0.65, 6.54)	2.10 (0.73, 6.04)
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.57 (0.57, 4.27)	1.51 (0.50, 4.52)	1.29 (0.44, 3.84)
Urban/rural status [ref=rural]	β_8	1.62 (0.86, 3.03)	1.75 (0.92, 3.34)	1.69 (0.87, 3.31)
Legal smoking age [ref=legal]	β_9	0.98 (0.45, 2.15)	1.18 (0.46, 2.98)	0.99 (0.43, 2.29)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_{10}	---	5.42 (2.29, 12.86)**	---
[4 v. 0 (ref)]	β_{11}	---	3.59 (1.25, 10.37)**	---
[3 v. 0 (ref)]	β_{12}	---	2.08 (0.90, 4.77)	---
[2 v. 0 (ref)]	β_{13}	---	2.17 (0.91, 5.18)	---
[1 v. 0 (ref)]	$\hat{\beta}_{14}$	---	1.82 (0.70, 4.73)	---

Smoking at home (ref = sometimes/often)	β_{15}	---	1.23 (0.81, 1.87)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{16}	---	1.06 (0.61, 1.87)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{17}	---	---	0.66 (0.39, 1.13)
Rebelliousness (ref=non-rebellious)	β_{18}	---	---	0.68 (0.35, 1.32)
Future discount rate (ref= low)	β_{19}	---	---	

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking
[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting
*p<0.05; **p<0.01; ***p<0.001

Table 3.6.b. Independent effects of covariates on plan to smoke among female youth non-smokers in Southeast Asia

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.10 (0.00, 2.39)	0.04 (0.00, 0.67)	0.60 (0.01, 30.03)
Cognition of risk [proxy for frequency of exposure]	β_1	0.42 (0.12, 1.45)	0.33 (0.09, 1.17)	0.50 (0.16, 1.60)
Country [Thailand v. Malaysia (ref)]	β_2	0.25 (0.04, 1.48)	0.34 (0.07, 1.72)	0.19 (0.03, 1.29)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	2.17 (0.29, 16.33)	2.32 (0.29, 18.88)	1.10 (0.26, 4.76)
[recruited wave 3 v. wave 1 (ref)]	β_4	0.59 (0.10, 3.51)	0.68 (0.12, 4.01)	0.43 (0.07, 2.67)
[recruited wave 2 v. wave 1 (ref)]	β_5	0.22 (0.03, 1.40)	0.20 (0.03, 1.46)	0.13 (0.02, 0.71)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	0.83 (0.06, 11.04)	1.03 (0.09, 11.45)	1.32 (0.08, 22.50)
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.31 (0.49, 3.49)	1.45 (0.51, 4.08)	1.63 (0.50, 5.32)
Urban/rural status [ref=rural]	β_8	1.02 (0.12, 8.93)	1.11 (0.13, 9.74)	0.94 (0.20, 4.48)
Legal smoking age [ref=legal]	β_9	1.14 (0.19, 6.86)	1.49 (0.25, 8.85)	1.27 (0.17, 9.42)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_{10}	---	---	---
[4 v. 0 (ref)]	β_{11}	---	4.66 (0.34, 63.42)	---
[3 v. 0 (ref)]	β_{12}	---	4.49 (0.80, 25.17)	---
[2 v. 0 (ref)]	β_{13}	---	4.42 (0.90, 21.69(	---

[1 v. 0 (ref)]	$\hat{\beta}_{14}$	---	1.47 (0.36, 5.96)	---
Smoking at home (ref = sometimes/often)	β_{15}	---	1.35 (0.42, 4.36)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{16}	---	1.23 (0.36, 4.21)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{17}	---	---	0.15 (0.04, 0.60)***
Rebelliousness (ref=non-rebellious)	β_{18}	---	---	3.99 (0.87, 18.31)
Future discount rate (ref= low)	β_{19}	---	---	0.17 (0.07, 0.42)***

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.6.c. Independent effects of covariates on susceptibility to smoke among male youth non-smokers in Southeast Asia

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.31 (0.15, 0.64)	0.16 (0.07, 0.34)	3.82 (0.80, 18.23)
Cognition of risk [proxy for frequency of exposure]	β_1	0.83 (0.65, 1.07)	0.81 (0.62, 1.06)	0.82 (0.63, 1.07)
Country [Thailand v. Malaysia (ref)]	β_2	1.76 (0.90, 3.45)	1.89 (0.99, 3.62)*	0.34 (0.08, 1.41)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	0.89 (0.42, 1.90)	1.15 (0.55, 2.41)	0.25 (0.08, 0.82)***
[recruited wave 3 v. wave 1 (ref)]	β_4	1.69 (1.10, 2.60)	2.00 (1.24, 3.22)	2.02 (1.28, 3.21)***
[recruited wave 2 v. wave 1 (ref)]	β_5	1.00 (0.61, 1.65)	1.06 (0.66, 1.69)	0.86 (0.52, 1.42)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	1.35 (0.87, 2.07)	1.23 (0.79, 1.92)	1.41 (0.91, 2.18)
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.45 (1.11, 1.90)	1.39 (1.09, 1.79)*	1.27 (0.84, 1.93)
Urban/rural status [ref=rural]	β_8	1.42 (0.92, 2.18)	1.45 (0.98, 2.13)	1.51 (1.00, 2.28)*
Legal smoking age [ref=legal]	β_9	1.39 (0.92, 2.09)	1.73 (1.14, 2.61)**	1.34 (0.88, 2.02)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_{10}	---	3.02 (1.59, 5.76)***	---
[4 v. 0 (ref)]	β_{11}	---	1.90 (1.07, 3.38)***	---
[3 v. 0 (ref)]	β_{12}	---	2.18 (1.33, 3.55)***	---

[2 v. 0 (ref)]	β_{13}	---	2.39 (1.52, 3.77)***	---
[1 v. 0 (ref)]	$\hat{\beta}_{14}$	---	1.18 (0.78, 1.79)	---
Smoking at home (ref = sometimes/often)	β_{15}	---	1.07 (0.77, 1.50)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{16}	---	0.95 (0.69, 1.32)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{17}	---	---	0.58 (0.40, 0.84)**
Rebelliousness (ref=non-rebellious)	β_{18}	---	---	0.79 (0.55, 1.14)
Future discount rate (ref= low)	β_{19}	---	---	0.65 (0.47, 0.91)**

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.6.d. Independent effects of covariates on susceptibility to smoke among female youth non-smokers in Southeast Asia

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.12 (0.03, 0.45)	0.08 (0.03, 0.24)	0.75 (0.10, 5.79)
Cognition of risk [proxy for frequency of exposure]	β_1	0.68 (0.36, 1.27)	0.63 (0.32, 1.21)	0.71 (0.37, 1.34)
Country [Thailand v. Malaysia (ref)]	β_2	0.90 (0.37, 2.23)	0.99 (0.42, 2.31)	0.24 (0.04, 1.26)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	0.90 (0.28, 2.89)	1.01 (0.31, 3.24)	0.26 (0.08, 0.88)
[recruited wave 3 v. wave 1 (ref)]	β_4	0.67 (0.36, 1.24)	0.79 (0.44, 1.44)	0.69 (0.38, 1.26)
[recruited wave 2 v. wave 1 (ref)]	β_5	0.65 (0.23, 1.82)	0.68 (0.23, 1.97)	0.65 (0.17, 2.56)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	1.72 (0.93, 3.19)	1.60 (0.83, 3.06)	2.47 (1.23, 4.99)*
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.12 (0.67, 1.85)	1.16 (0.64, 2.09)	1.88 (0.96, 3.69)
Urban/rural status [ref=rural]	β_8	0.79 (0.34, 1.86)	0.81 (0.34, 1.91)	0.79 (0.34, 1.83)
Legal smoking age [ref=legal]	β_9	1.38 (0.70, 2.71)	1.54 (0.76, 3.14)	1.44 (0.69, 3.01)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_{10}	---	2.65 (1.05, 6.73)**	---
[4 v. 0 (ref)]	β_{11}	---	4.32 (1.26, 14.82)**	---

[3 v. 0 (ref)]	β_{12}	---	3.09 (1.16, 8.28)**	---
[2 v. 0 (ref)]	β_{13}	---	1.85 (0.73, 4.70)	---
[1 v. 0 (ref)]	$\hat{\beta}_{14}$	---	2.30 (0.18, 4.50)	---
Smoking at home (ref = sometimes/often)	β_{15}	---	0.85 (0.49, 1.50)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{16}	---	1.04 (0.56, 1.95)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{17}	---	---	0.40 (0.18, 0.87)*
Rebelliousness (ref=non-rebellious)	β_{18}	---	---	2.30 (1.31, 4.04)**
Future discount rate (ref= low)	β_{19}	---	---	0.64 (0.32, 1.26)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.6.e. Independent effects of covariates on susceptibility to smoke among female youth never-smokers in Southeast Asia

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.07 (0.02, 0.29)	0.04 (0.01, 0.18)	0.09 (0.01, 0.77)
Cognition of risk [proxy for frequency of exposure]	β_1	0.68 (0.37, 1.25)	0.66 (0.35, 1.23)	0.71 (0.37, 1.37)
Country [Thailand v. Malaysia (ref)]	β_2	0.87 (0.28, 2.72)	1.01 (0.34, 2.98)	0.60 (0.08, 4.40)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	0.47 (0.12, 1.82)	0.48 (0.13, 1.81)	0.45 (0.13, 1.56)
[recruited wave 3 v. wave 1 (ref)]	β_4	0.57 (0.22, 1.52)	0.60 (0.21, 1.68)	0.85 (0.36, 2.01)
[recruited wave 2 v. wave 1 (ref)]	β_5	0.58 (0.19, 1.80)	0.59 (0.19, 1.77)	0.74 (0.21, 2.59)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	1.81 (0.81, 4.03)	1.83 (0.75, 4.42)	1.81 (0.86, 3.80)
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.20 (0.60, 2.42)	1.36 (0.62, 2.94)	1.27 (0.49, 3.30)
Urban/rural status [ref=rural]	β_8	0.75 (0.33, 1.69)	0.70 (0.30, 1.61)	0.96 (0.36, 2.54)
Legal smoking age [ref=legal]	β_9	2.29 (1.11, 4.69)*	2.61 (1.26, 5.38)**	2.15 (1.03, 4.47)*
Social/normative variables				

Peer smoking [5 v. 0 (ref)]	β_{10}	---	3.86 (1.22, 12.19)	---
[4 v. 0 (ref)]	β_{11}	---	5.18 (0.78, 34.14)	---
[3 v. 0 (ref)]	β_{12}	---	2.48 (0.82, 7.56)	---
[2 v. 0 (ref)]	β_{13}	---	1.48 (0.51, 4.27)	---
[1 v. 0 (ref)]	$\hat{\beta}_{14}$	---	2.55 (1.03, 6.33)	---
Smoking at home (ref = sometimes/often)	β_{15}	---	0.72 (0.39, 1.33)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{16}	---	1.26 (0.69, 2.30)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{17}	---	---	0.77 (0.30, 1.94)
Rebelliousness (ref=non-rebellious)	β_{18}	---	---	1.30 (0.51, 3.28)
Future discount rate (ref= low)	β_{19}	---	---	0.96 (0.43, 2.14)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.7.a. Independent effects of covariates on smoking initiation among male youth non-smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.21 (0.11, 0.41)	0.21 (0.09, 0.49)***	0.22 (0.09, 0.58)***
Cognition of risk [proxy for frequency of exposure]	β_1	0.37 (0.25, 0.55)***	0.37 (0.26, 0.54)***	0.38 (0.26, 0.56)***
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.73 (0.17, 3.09)	0.78 (0.19, 3.14)	0.70 (0.17, 2.91)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.60 (0.71, 3.61)	1.65 (0.75, 3.62)	1.53 (0.72, 3.24)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.68 (0.90, 3.13)	1.67 (0.88)	1.61 (0.90, 2.89)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.24 (0.67, 2.32)	1.20 (0.65, 2.23)	1.30 (0.67, 2.50)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.64 (0.31, 1.30)	0.63 (0.31, 1.27)	0.71 (0.31, 1.59)
Urban/rural status [ref=rural]	β_7	1.55 (0.86, 2.80)	1.55 (0.85, 2.83)	1.52 (0.86, 2.67)
Legal smoking age [ref=legal]	β_8	1.61 (0.94, 2.75)	1.64 (0.91, 2.95)*	1.64 (0.94, 2.88)

Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	0.75 (0.25, 2.27)	---
[4 v. 0 (ref)]	β_{10}	---	0.81 (0.30, 2.18)	---
[3 v. 0 (ref)]	β_{11}	---	1.82 (1.06, 3.13)***	---
[2 v. 0 (ref)]	β_{12}	---	1.09 (0.58, 2.04)	---
[1 v. 0 (ref)]	β_{13}	---	0.62 (0.30, 1.30)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	1.07 (0.73, 1.57)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	0.91 (0.62, 1.34)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	0.98 (0.58, 1.67)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	1.21 (0.76, 1.93)
Future discount rate (ref= low)	β_{18}	---	---	0.80 (0.56, 1.16)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05;

**p<0.01; ***p<0.001

Table 3.7.b. Independent effects of covariates on high smoking intensity among male youth smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	0.26 (0.06, 1.18)	Model does not converge	0.29 (0.05, 1.79)
Cognition of risk [proxy for frequency of exposure]	β_1	3.62 (1.33, 9.79)**	Model does not converge	3.28 (1.10, 9.78)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.35 (0.01, 8.79)	Model does not converge	0.25 (0.01, 6.58)
[recruited wave 3 v. wave 1 (ref)]	β_3	2.06 (0.54, 7.78)	Model does not converge	2.23 (0.55, 9.13)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.95 (0.22, 4.12)	Model does not converge	0.88 (0.17, 4.46)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.47 (0.15, 1.43)	Model does not converge	0.57 (0.16, 2.01)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.82 (0.27, 2.54)	Model does not converge	0.90 (0.32, 2.51)
Urban/rural status [ref=rural]	β_7	0.74 (0.27, 1.99)	Model does not converge	0.78 (0.32, 1.88)
Legal smoking age [ref=legal]	β_8	0.04 (0.00, 0.61)*	Model does not converge	---

Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	Model does not converge	---
[4 v. 0 (ref)]	β_{10}	---	Model does not converge	---
[3 v. 0 (ref)]	β_{11}	---	Model does not converge	---
[2 v. 0 (ref)]	β_{12}	---	Model does not converge	---
[1 v. 0 (ref)]	β_{13}	---	Model does not converge	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	Model does not converge	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	Model does not converge	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	0.48 (0.19, 1.17)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	0.88 (0.34, 2.24)
Future discount rate (ref= low)	β_{18}	---	---	2.08 (0.79, 5.43)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05;

**p<0.01; ***p<0.001

Table 3.7.c. Independent effects of covariates on quit attempt among male youth smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	2.99 (1.24, 7.21)*	2.51 (0.60, 10.50)	1.75 (0.41, 7.52)
Cognition of risk [proxy for frequency of exposure]	β_1	1.01 (0.52, 1.96)	1.12 (0.47, 2.64)	0.86 (0.47, 1.59)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.48 (0.12, 18.73)	0.92 (0.05, 16.52)	1.54 (0.11, 20.84)
[recruited wave 3 v. wave 1 (ref)]	β_3	0.72 (0.21, 2.53)	0.80 (0.25, 2.55)	0.71 (0.21, 2.43)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.97 (0.27, 3.52)	1.05 (0.26, 4.22)	0.99 (0.27, 3.61)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.36 (0.11, 1.17)	0.26 (0.08, 0.85)*	0.42 (0.13, 1.38)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.54 (0.23, 1.23)	0.45 (0.19, 1.07)	0.56 (0.24, 1.35)

Urban/rural status [ref=rural]	β_7	1.15 (0.57, 2.33)	1.11 (0.55, 2.22)	1.15 (0.60, 2.21)
Legal smoking age [ref=legal]	β_8	0.45 (0.11, 1.81)	0.46 (0.09, 2.35)	0.46 (0.12, 1.77)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	1.07 (0.34, 3.42)	---
[4 v. 0 (ref)]	β_{10}	---	2.02 (0.48, 8.41)	---
[3 v. 0 (ref)]	β_{11}	---	3.39 (0.65. 17.63)	---
[2 v. 0 (ref)]	β_{12}	---	1.70 (0.36, 8.05)	---
[1 v. 0 (ref)]	β_{13}	---	0.60 (0.10, 3.51)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	1.02 (0.59, 1.75)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	0.97 (0.47, 1.97)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	1.11 (0.38, 3.23)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	0.83 (0.42, 1.66)
Future discount rate (ref= low)	β_{18}	---	---	1.99 (0.86, 4.61)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age
[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking [c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.7.d. Independent effects of covariates on increased smoking intensity among male youth smokers in Thailand

		Model 1[a]	Model 2[b]	Model 3[c]
Constant	β_0	1.05 (0.25, 4.40)	0.75 (0.23, 2.48)	1.00 (0.17, 6.06)
Cognition of risk [proxy for frequency of exposure]	β_1	2.89 (1.31, 6.37)*	2.60 (0.99, 6.84)*	3.28 (1.43, 7.54)**
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.05 (0.05, 20.49)	1.12 (0.10, 13.18)	1.05 (0.05, 22.41)
[recruited wave 3 v. wave 1 (ref)]	β_3	11.24 (2.44, 51.88)**	11.23 (2.34, 53.94)**	10.32 (2.33, 45.82)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.07 (0.35, 3.22)	1.08 (0.38, 3.03)	1.07 (0.34, 3.32)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.15 (0.45, 2.91)	1.11 (0.42, 2.91)	1.19 (0.47, 3.02)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.48 (0.54, 4.08)	1.45 (0.50, 4.27)	1.56 (0.52, 4.64)

Urban/rural status [ref=rural]	β_7	0.87 (0.38, 1.99)	0.90 (0.35, 2.31)	0.88 (0.36, 2.12)
Legal smoking age [ref=legal]	β_8	0.65 (0.22, 1.92)	0.42 (0.17, 1.04)	0.63 (0.23, 1.77)
Social/normative variables				
Peer smoking [5 v. 0 (ref)]	β_9	---	0.25 (0.03, 1.82)	---
[4 v. 0 (ref)]	β_{10}	---	0.21 (0.03, 1.55)	---
[3 v. 0 (ref)]	β_{11}	---	0.51 (0.04, 7.37)	---
[2 v. 0 (ref)]	β_{12}	---	0.66 (0.08, 5.39)	---
[1 v. 0 (ref)]	β_{13}	---	0.50 (0.03, 7.29)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	1.36 (0.65, 2.85)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	1.46 (0.38, 5.58)	---
Intrapersonal variables				
Self-esteem (ref = low)	β_{16}	---	---	1.22 (0.48, 3.11)
Rebelliousness (ref=non-rebellious)	β_{17}	---	---	0.76 (0.32, 1.83)
Future discount rate (ref= low)	β_{18}	---	---	0.83 (0.44, 1.53)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Table 3.7.e. Independent effects of covariates on decreased smoking intensity among male youth smokers in Thailand

		Model 1[b]	Model 2[c]	Model 3[d]
Constant	β_0	0.88 (0.21, 3.70)	1.28 (0.11, 15.20)	1.15 (0.32, 4.15)
Cognition of risk [proxy for frequency of exposure]	β_1	2.71 (1.07, 6.85)*	3.20 (1.08, 8.23)	3.47 (1.07, 11.28)*

Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.02 (0.07, 15.65)	1.09 (0.03, 41.69)	0.70 (0.04, 13.60)
[recruited wave 3 v. wave 1 (ref)]	β_3	4.05 (1.04, 15.88)	1.70 (0.35, 8.15)	3.67 (0.73, 18.42)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.76 (0.26, 2.22)	0.62 (0.26, 1.51)	0.69 (0.25, 1.86)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.53 (0.49, 4.80)	3.91 (0.59, 26.02)	1.72 (0.51, 5.82)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	2.26 (0.76, 6.72)	4.15 (0.91, 18.97)	2.16 (0.67, 6.94)
Urban/rural status [ref=rural]	β_7	0.62 (0.25, 1.56)	0.67 (0.22, 1.99)	0.64 (0.23, 1.75)
Legal smoking age [ref=legal]	β_8	0.19 (0.04, 0.84)*	0.05 (0.01, 0.50)	0.17 (0.04, 0.78)*
Peer smoking [5 v. 0 (ref)]	β_9	---	0.32 (0.07, 1.51)	---
[4 v. 0 (ref)]	β_{10}	---	0.06 (0.01, 0.48)	---
[3 v. 0 (ref)]	β_{11}	---	0.20 (0.02, 1.74)	---
[2 v. 0 (ref)]	β_{12}	---	2.46 (0.49, 12.37)	---
[1 v. 0 (ref)]	β_{13}	---	1.42 (0.15, 13.07)	---
Smoking at home (ref = sometimes/often)	$\hat{\beta}_{14}$	---	0.41 (0.18, 0.95)	---
Society disapproves of smoking [agree v. disagree (ref)]	β_{15}	---	2.42 (0.56, 10.48)	---
Self-esteem (ref = low)	β_{16}	---		0.73 (0.18, 2.98)
Rebelliousness (ref=non-rebellious)	β_{17}	---		0.50 (0.17, 1.50)
Future discount rate (ref= low)	β_{18}	---		0.95 (0.44, 2.04)

[a]Models adjusted for wave-pair, cohort, urban/rural status, and legal smoking age

[b]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, peer smoking, smoking at home, societal opinion of smoking

[c]Models adjusted for wave-pair, cohort, urban/rural status, legal smoking age, self-esteem, rebelliousness, and future discounting *p<0.05; **p<0.01; ***p<0.001

Chapter 4. Investigation of the Impact of Graphic Cigarette Warning Label Salience on Adult Smoking Behaviors in Malaysia and Thailand and Moderating Effects of Loosies: Results from International Tobacco Control Project

4.1. Introduction

The development of effective tobacco control policies aimed at curbing smoking is a global health priority. The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC), which was adopted in 2005, has formalized global commitment to reducing smoking worldwide [184]. However, country-specific progress varies substantially, with a high prevalence of smoking and stagnating trends in many countries [185]. WHO estimates that approximately six million people worldwide die each year from causes attributed to smoking, with most of these deaths occurring in lowincome and middle-income countries [184, 186]. If current trends continue, tobacco-induced mortality will reach 8.3 million by 2030, with 80% of deaths in developing countries [187]. Smoking projections underscore the need for innovative tobacco control strategies to reverse trends and accelerate progress where smoking prevalence remains high.

Tobacco companies have spent decades and many millions of dollars creating advertising campaigns that have been found to be extraordinarily effective in creating, maintaining, and expanding their market. Cigarette advertising companies developed these techniques through careful research, much of which has utilized the findings and theoretical perspectives of social psychology and marketing [37]. As such, the development and expansion of public health policies aimed at reversing these trends is imperative. One such policy is the implementation of graphic cigarette warning labels which use images of the health effects of smoking to effectively communicate smoking-related risks.

4.1.1. Graphic Cigarette Warning Labels

Health warning labels on cigarette packs represent a low cost, educational policy aimed at decreasing tobacco consumption and subsequent mortality [92]. Over the past few decades, warning labels have become a popular method by which governments attempt to inform their citizens of the health consequences of smoking, although the nature of those health warnings varies considerably across countries [37]. Graphic warning labels have been shown to be more effective than text-only warnings [13,

120], especially in countries with low literacy or where several languages are spoken [13]. The FCTC obligates the implementation of broad comprehensive tobacco control policies, including the placement of rotating health warnings on tobacco packaging written in all principal languages. Warning labels should describe specific harmful effects of tobacco use on health and are suggested to cover at least 30%, but ideally at least 50%, of the package's external surface area [188, 189].

The basic assumption underlying the demand for health warnings cigarette packs is that people are not aware, or not fully aware, of the dangers of tobacco. Education on these dangers would, therefore, prevent initiation among non-smokers or lead smokers to quit or reduce smoking intensity. Indeed, although most people know that smoking is harmful in general, many tobacco users underrate the risk to which they are exposing themselves and others [17]. Furthermore, smokers tend to underestimate the range of illnesses associated with tobacco use [190]. This lack of knowledge is met by false beliefs that further undermine perceiving tobacco use as a health risk. Specific examples of include the assumption that ‘low-tar’ and ‘light’ cigarettes are less harmful [191] and that quitting smoking is easy since it is a ‘bad habit’ and not an addiction [192].

4.1.2. Effectiveness of Graphic Warning Labels among Adults

Among adult smokers, there is substantial evidence favoring the effectiveness of graphic health warnings as a tobacco control measure [14, 20, 92-101]. Previous research has found that large graphic warning labels on cigarette packages are an important source of health information for smokers and nonsmokers [37]. Exposure to graphic labels has been shown to reduce cigarette packet appeal [26], increase health knowledge, awareness and perception of risks associated with smoking [13-15, 17, 20, 94, 95, 100, 102], strengthen intention to quit [94], encourage quit attempts [13, 20, 26, 100, 102], increase use of quitlines [95], prevent relapse [103], discourage smoking initiation [26, 100, 102] and decrease the odds of being a smoker [20, 101]. The majority of research on the impact of graphic warning labels has been conducted in Western countries, the knowledge from which is not necessarily generalizable to developing countries, due to different socioeconomic conditions and cultural contexts and disparities in tobacco control policies and social acceptability of smoking [65, 193, 194]. Thus, there is a crucial need for research in these regions.

The limited evidence published in developing countries suggests the effectiveness of graphic warning labels is promising. An experimental study in China found that adult smokers were more likely to rate graphic warnings as more effective than text-only warnings in motivating smoking cessation and preventing smoking among youth [104]. Similarly, an experimental study conducted in Malaysia prior to the implementation of the graphic warning label policy suggested that graphic labels had a greater positive impact than text-only labels [22]. Other studies have supported the conclusion that graphic labels impact cognitive and behavioral reactions, as well as desire to quit [16, 105]. A study by Yong et al. (2013) found that, following the implementation of the graphic warning label policy in Thailand, smokers' salience, and cognitive and behavioral reactions increased markedly, with effects sustained at follow-up, as compared to Malaysian controls [71].

Although the majority of research has supported the effectiveness of graphic cigarette warnings in their goal of reducing smoking behavior, some researchers argue that graphic labels have no effect, or a potentially negative effect on smoking outcomes. Petersen and Lieder (2006) found no difference between the influence of text-only and graphic warning labels on perceived health risks, outcome expectations, self-efficacy expectations, and behavior [195]. Ruiter and Kok [28, 29] contend that the evidence in support of the policy is sparse and unconvincing, and find flaws in research design and methodology.

Some psychologists and social scientists argue that graphic labels may elicit avoidance, defensiveness, and denial. Smokers may even take measures to cover the cigarette packs or buy loose cigarettes ("loosies") to avoid exposure to warning labels. The graphic nature of the warnings is intended to evoke more fear than text-only warnings [153], which may cause smokers to employ defensive psychological mechanisms to protect themselves [28, 30, 31]. Erceg-Hurn and Steed [154] found that participants exposed to the graphic warnings felt more irritated, angry, annoyed and aggravated with the warnings than their text-only counterparts. Experimental research on the effectiveness of graphic warning labels has shown that smokers defended themselves against the fear-inducing content, as they decreased their smoking-related risk perceptions compared to smokers who were not exposed to graphic warning labels [156, 157]. Such mal-adaptive defensive mechanisms might be the result of cognitive dissonance [155, 158], the situation involving conflicting attitudes, beliefs, or behaviors. In the context of warning

labels, the theory of cognitive dissonance would predict that there might be a perceptual distortion of the cognitive element concerning the believability of the warning labels' statements of the harms of smoking [196].

The conflicting evidence on graphic warning label policies, as well as the lack of evidence from developing countries, underscores the need for additional research their impact on smoking outcomes. The goal of our research is to assess the effect of graphic cigarette warnings on adult smoking behavior in Thailand and Malaysia, specifically: high smoking intensity, reduced smoking intensity, plan to quit, quit attempts, and cessation. Our primary predictor variable, label saliency, serves as a proxy for frequency of exposure, due to the potential correlation between smoking status and exposure to warning labels, which may contaminate our analyses of smoking outcomes (e.g., a high intensity smoker will likely have a higher frequency of exposure to the warning labels, thus contaminating analysis of smoking intensity as an outcome).

Our study will address gaps in the research in the following ways. First, we utilize multiple waves of data spanning from 2006 to 2012, from the International Tobacco Control (ITC) Southeast Asia (SEA) Project. Second, our primary outcome variables, smoking intensity and cessation, are measures of behavioral *change*, which build upon many previous studies focusing on behavioral *intention*. Third, this is the first study of which we are aware to analyze post-policy implementation data on adults from Malaysia. Lastly, we utilize two different measures of label salience; the first compares *never* reading warning labels to *ever* reading warning labels. The second compares levels of frequency with which labels are read (*high* versus *low* frequency).

Our primary objective is to better understand the role of label salience in the context of graphic cigarette warning labels, and to determine if label salience is an effective predictor of smoking behavior. Furthermore, this issue is especially important in light of potential avoidance tactics such as buying single cigarettes or covering packs, which would seemingly inhibit exposure to graphic warning labels and thus hinder label salience. As such, we also explore purchasing loose cigarettes as a potential effect modifier of the association between label salience and smoking outcomes.

4.2 Methods

4.2.1. Data Source

This study utilized nationally representative data from the International Tobacco Control South East Asia (ITC SEA) Survey. Details on the conceptual framework of the ITC Survey and its methodology have been published elsewhere [11, 12]. Briefly, the ITC SEA Survey is a prospective, longitudinal, cohort survey of youth and adults in Thailand and Malaysia. Eligible respondents include youth smokers and non-smokers (recruitment age 13-17 in Malaysia; age 13-19 in Thailand), adult smokers (age 18+) and adult non-smokers in Malaysia; adult non-smokers in Thailand were not recruited in any waves. As this study examines the adult response, youth were excluded from the sample. Additionally, as outcomes included smoking intensity, quit attempts, and cessation, only adults classified as baseline smokers were included in our sample. A smoker is defined here as someone who has smoked at least 100 cigarettes in their lifetime and smokes at least weekly. As such, adult non-smokers (at baseline) were also excluded from analyses, though participants may be 'quitters' at follow-up. Respondents were surveyed using face to-face and phone interviews, and were recruited from households using a stratified multistage sampling design. Please see figures 4.1 and 4.2 for a timeline of tobacco policies and ITC survey data collection waves in Malaysia and Thailand, respectively.

We limit our analyses to waves 2 through 5 for Thailand, and 4 and 5 for Malaysia to isolate postpolicy implementation periods in each country. Data collection for wave 2 was conducted from August to September in Thailand, approximately 15-18 months after the introduction of graphic warning labels. Wave 3 was conducted from January to March 2008 in Thailand, approximately 11 months after the second round of graphic labels was implemented. Wave 4 was conducted from April to July 2011 in Thailand, approximately 26-29 months after the second round of labels was implemented, and from July to November 2009 in Malaysia approximately 1-5 months after the initial introduction of graphic warnings. Finally, wave 5 was conducted from February to April 2011 in Thailand, approximately 11 to 13 months after the third round of graphic warnings was introduced, and from May 2011 to April 2012 in Malaysia, approximately 23 – 34 months after the introduction of graphic warning labels.

4.2.2. Measures

4.2.2.1. Primary Outcome: Smoking Behavior

Smoking behavior was measured by 6 separate variables: **high smoking intensity** (15+ cigarettes per day)**, reduced smoke intensity**, **plan to quit within 6 months, quit attempts** (between baseline and follow-up waves), **cessation** (defined as not having smoked a cigarette in the past 30 days), and **quit because of label** (among those who quit between baseline and follow-up).

High smoking intensity, among smokers at follow-up, took the value 1 where participants reported smoking 15 or more cigarettes at follow-up. Respondents who reported smoking fewer than 15 cigarettes at follow-up were coded 0. Among smokers, change in **smoking intensity**, specifically 'reduced smoking intensity,' was assessed by the question, "Since we last talked to you, about one year ago, have you made any change in the amount you smoke?" If participants responded "yes," they answered the follow-up question, "What change did you make?" Responses included: "Quit smoking," "Reduce smoking," and "Increase smoking." **Reduced intensity** was coded 1 if participants responded "decreased intensity," and 0 otherwise (excluding those who were 'quit' at follow-up).

Plan to quit within 6 months was a binary variable measured among participants classified as smokers at follow-up. It was based on responses to the following survey question: "Which of the following describe your thoughts about quitting smoking?" Responses comprised: "I plan to quit in the next 30 days [1 month]"; "I plan to quit sometime in the next 6 months"; "I plan to quit, but not in the next 6 months"; and "I do not plan to quit at all". Respondents who reported planning to quit within the next 30 days or 6 months were coded 1; all those who reported not planning to quit within 6 months ('I plan to quit, but not in the next 6 months' or 'I do not plan to quit at all') were coded 0.

Quit attempt, measured among baseline smokers, was a binary variable based upon responses to the question, "Since we last talked to you, have you made any attempts to quit?" Quit attempt took the value 1 if respondents replied 'yes,' and 0 otherwise. **Cessation**, also measured among baseline smokers, was assessed by the question, "Since we last talked to you, about one year ago, have you made any change in the amount you smoke?" If participants responded "yes," they answered the followup

question, “What change did you make?” Responses included: “Quit smoking,” “Reduce smoking,” and “Increase smoking.” Cessation was coded 1 if participants responded “quit smoking,” and 0 otherwise.

Quit because of label was assessed by the question, “In the past 6 months, were you led to quit or stay quit by warning labels on cigarette packages?” Respondents who answered “very much” or “somewhat” were coded 1, all those who responded “not at all” were coded 0.

4.2.2.2. Independent Variable of Interest: Label Salience

To assess the effect of the graphic warning label policy on smoking behavior, we utilized a measure of label salience, known in this literature as “**reading**” labels. Label salience is measured by the survey item, “In the last month, how often, if at all, have you read or looked closely at the health warnings on cigarette packages?” The response options were “never,” “once in a while,” often,” and “very often.” We measure label salience in two ways: first, we assess the impact of *any* label salience (versus *no* label salience) by coding participants who responded “once in a while,” “often,” or “very often” as 1, and all those who responded “never” as 0. Second, we assess the effect of *high* versus *low* salience by coding participants were responded “often” or “very often” as 1, reflecting high salience, and all those who responded “once in a while” or “never” as 0, reflecting low salience.

Moreover, as we had originally intended to study the effect of frequency of exposure to the graphic warning labels, we fitted models in which our outcome variable captured label salience (**notice**), where our measure was the number of times in in the last month participants *noticed* health warnings on cigarette packages (“never,” “once in a while,” “often,” and “very often”). Contrary to our expectations, the results of these models suggested a positive association between number of cigarettes smoked and frequency of exposure to graphic warning labels. We hypothesize that such a perverse effect arises from the conflation of the dependent and independent variables. (In other words, label saliency (*notice*), or exposure to graphic warning labels, among high-intensity smokers occurs *via* the intensity of their consumption.) As a result, a tautology ensues, which precluded our use of the intended salience variable, and motivated our search for a substitute measure. Although subtle, the distinction between simply *noticing* the labels and *reading* the labels resolved the observed perverse effect.

4.2.2.3. Sociodemographic Variables

The potential set of basic control variables comprise gender (female=1), age group (4 dummy variables: 18-24 (referent), 25-39, 40-54, and 55 years and older), religion (3 dummy variables: Islam, Buddhism, and other (referent)), ethnicity (majority group vs. minor group (referent)), and urban/rural status (rural=referent). Ethnic minority status and urban/rural status were obtained from the household enumeration. Religion and ethnicity were ultimately omitted from GEE analyses, as they were highly correlated with country of residence, as participants from Malaysia are primarily Islamic and Malay, and participants from Thailand predominantly Buddhist and Thai.

We derived relative measures for education and income to standardize across countries using standards set by Li et al (2010) [65]. "Low" level of education (referent) was defined as receiving no schooling/lower elementary in Malaysia or no schooling/low elementary in Thailand; "moderate" education was defined as upper elementary to upper secondary in Malaysia or elementary to upper secondary in Thailand; "high" level of education was defined as postsecondary education (from pre-university to postgraduate degree). With regard to income, "low" income was defined as earning $\leq$10,000 ringgit in Malaysia (referent), $\leq$70 Baht in Thailand, annually; "moderate" income was defined as earning between 10,001 and 30,000 ringgit in Malaysia, 70,001 through 195,749 Baht in Thailand, annually; "high" income was defined as earning >30,000 ringgit in Malaysia, $\geq$195,750 Baht in Thailand, annually. A fourth classification captured those refusing or unable to answer. We also control for cohort (the wave in which participants were first recruited into the ITC Project) and wave-pair, which accounts for secular changes in smoking behavior.

4.2.2.4. Smoking-Relevant Control Variables

Level of addiction was proxied by a measure of smoking intensity at baseline. Participants were asked, "On average, how many cigarettes do you smoke each day, including both factory-made and hand-rolled cigarettes?" Responses were measured continuously and were dummied as follows: $\leq$5 (referent), 6-14, 15+ cigarettes per day. Smoking frequency was assessed by the question, "Do you smoke every day or less than every day, including both factory-made and hand-rolled cigarettes?" Those

who responded “every day” were coded 1, indicating daily-smoking; participants who answered “less than every day” were coded 0.

Cigarette type was assessed by the question, “are you currently smoking factory-made or handrolled cigarettes.” Three dummy variables were created: factory-made (referent), both hand-rolled and factory-made, and hand-rolled. Noticed anti-smoking campaign was assessed by the question: “In the last 6 months, have you noticed any anti-smoking information or advertising from TV, radio, billboards, newspapers or magazines, on shop/store windows or inside shops/stores where you buy tobacco? Those who responded “yes” were coded 1, all others were coded 0.

Self-efficacy was assessed by the question, “If you decided to give up smoking completely in the next 6 months, how sure are you that you would succeed?” Responses comprised “not at all sure,” “somewhat sure,” “very sure,” and “extremely sure.” Participants who responded “very sure” or “extremely sure” were coded 1, indicating a high level of self-efficacy. Those who responded “not at all sure” or “somewhat sure” were coded 0.

We include a measure of “loosies” (loose or single cigarettes) as assessed by the survey item, “The last time you bought cigarettes for yourself, did you buy them by the carton, the pack, or as single cigarettes?” All participants who responded “as single cigarettes” were coded 1, all others were coded 0.

4.2.3. Statistical Analysis

4.2.3.1. Descriptive Analysis

Univariate statistics were used to describe the sample. Results are stratified by country (Malaysia and Thailand). We present frequencies as well as sample proportions displayed as column percentages.

4.2.3.2. Inferential Analysis

We used data from seven years (2006-2012) of the ITC-SEA. The data were arranged in three wave-pairs for Thailand and one wave-pair for Malaysia, in which we combined contiguous baseline and follow-up data.

Wave-pair 1	**Wave-pair 2**	**Wave-pair 3**	**Wave-pair 4**
Wave 1 + Wave 2	Wave 2 + Wave 3	Wave 3 + Wave 4	Wave 4 + Wave 5
TH: Jan 2005 – Sept 2006	TH: Aug 2006 – Mar 2008	TH: Jan 2008 – July 2009	TH: Apr 2009 – Apr 2011

MY: Jan 2005 – June 2007	MY: Aug 2006 – Sept 2008	MY: Feb 2008 – Nov 2009	MY: Jul 2009 – Apr 2012

The 2006-2012 period in Thailand, and 2009-2012 period in Malaysia, reflect a policy environment in which both countries had enacted graphic cigarette warning labels (i.e., existed in post-policy period).

Equations (1) to (3) depict the relationship between our smoking outcomes and salience of risk.

$$\text{Logit}\,(P(\text{SMOKING OUTCOMES}_{it})) = \beta_0 + \beta_1 \bullet \text{LABEL SALIENCE (any v. no)}_i + \beta_x \bullet X_{i(t-1)} \quad (1)$$

$$\text{Logit}\,(P(\text{SMOKING OUTCOMES}_{it})) = \beta_0 + \beta_1 \bullet \text{LABEL SALIENCE (high v. low)}_i + \beta_x \bullet X_{i(t-1)} \quad (2)$$

$$\text{Logit}\,(P(\text{SMOKING OUTCOMES}_{it})) = \beta_0 + \beta_1 \bullet \text{LABEL SALIENCE}_i + \beta_2 \bullet \text{LOOSIES}_i + \beta_3 \bullet (\text{LABEL SALIENCE} * \text{LOOSIES})_i + \beta_x \bullet X_{i(t-1)} \quad (3)$$

In equations (1) and (2), SMOKING OUTCOMES, which were measured at follow-up (time t), are expressed as a function of LABEL SALIENCE (the proxy for frequency of exposure to the graphic warning labels), and a vector of covariates (X), which were lagged to the baseline (t-1) of each data wave-pair. The difference between the models is in the measurement of LABEL SALIENCE. In equation (3), both LOOSIES and multiplicative interaction between LABEL SALIENCE and LOOSIES was added to the right-hand-side of the equation. In each model, β_0 is the regression constant.

We fitted equations (1) and (2) for each smoking outcome to test different thresholds of label salience. The measure of salience in equation (1) distinguishes any salience from no salience; that in equation (2) distinguishes high salience from low salience. The model associated with equation (3) explores differences in the effect of label salience on smoking outcomes according to whether participants consume loosies or packaged cigarettes. All models controlled for wave-pair (i.e., time), cohort, sex, age group, urban/rural status, education, income, level of addiction (proxied by daily smoking intensity), smoking frequency, type of cigarette smoked, self-efficacy, and noticed anti-smoking campaign. Analyses were run separately for the following sub-populations: 1) all adult smokers in Thailand, 2) male adult smokers in Thailand, and 3) all adult smokers in Thailand and Malaysia. Country differences were examined by including country-by-predictor interaction terms into the model. Since no by-country

interactions were found to be significant, the analyses reported here combined data from both countries. We also conducted analyses of the Thai sample, without the Malaysian sample, to assess Thai-specific outcomes. The limited size of the Malaysian sample hindered the ability to do the same with Malaysian data. To assess whether results would be significantly altered if we only included the male sample, we conducted ancillary analyses with female smokers removed from the data (there being insufficient women to do full interactive analyses).

We estimated the models with Generalized Estimating Equations (GEE) models, which generate population-averaged (marginal) effects of graphic cigarette warning labels on smoking outcomes. GEE is preferable to other techniques (e.g., fixed effects regression) for several major reasons. First, it corrects for intra-subject correlation that arises from repeated-measures data. Second, it estimates populationaveraged coefficients directly from observed data without restrictive assumptions about heterogeneity across individuals in the parameters [116]. Third, it accommodates dependent variables of various distributions (e.g., linear, logit, count, etc.) And finally, it permits the overt estimation of regression parameters on time-independent covariates, whose effects on the outcomes may be of interest to the investigator or policymaker.

Our analyses were conducted using SAS-Callable SUDAAN version 11.0.1 to account for the multistage sampling design and oversampling used in the ITC-SEA Project and the longitudinal nature of the data. Analyses were conducted using unweighted and weighted data for all models, with no significant differences observed between weighted and unweighted analyses. Results are presented for weighted analyses, with standard errors and model coefficients adjusted accordingly. As all outcomes are binary, we generate odds ratios and 95% confidence intervals. The QIC (Quasi-likelihood under the Independence model Criterion) statistic was used for comparing models fit with likelihood-based methods among otherwise equally suitable structures.

4.3. Results

Table 4.2 contains summary statistics for the country-stratified sample. Approximately 34.9% of the Malaysian sample and 39.15% of the Thai sample were high intensity smokers ($\geq$15 cigarettes per day) at baseline, with a mean of 13.18 and 11.14 cigarettes per day, respectively. At follow-up, 31.55% and 37.63% were high-intensity smokers, with a mean of 11.93 and 10.91 cigarettes per day in Malaysia

and Thailand, respectively. Aligning with national trends in each country, the number of male smokers in our sample far overweighed that of females with 98.71% and 94.87% of the sample being males in Malaysia and Thailand, respectively. The small number of female smokers limited our ability to stratify by gender, so we present results for a combination of males and females, controlling for sex (Table 4.3), as well as for males only (Table 4.4). With regard to our predictor variable, label salience, 5.29% of the Malaysian sample and 10.06% of Thai sample reported *never* reading the warning labels on cigarettes. Finally, purchasing loosies, which we examined as an effect modifier of smoking outcomes, was more common among Thai participants, with 22.04% purchasing their last cigarette in the form of a loose cigarette, as compared to 3.36% in Malaysia. Other relevant information may be obtained from Table 4.2.

4.3.1. Multivariable Model Summary

Tables 4.3 through 4.6 present results of regressions that estimated the association between smoking outcomes and exposure to graphic cigarette labeling (proxied by label salience); specifically, Table 4.3 presents results among all adult smokers in Thailand; Table 4.4 presents results among male adult smokers in Thailand; Table 4.5 presents results among adult male smokers in Thailand and Malaysia; and Table 4.6 presents results of our examination of loosies as an effect modifier among adult male smokers in Thailand and Malaysia. Once more, the outcomes were: high smoking intensity, reduced smoking intensity, plan to quit, quit attempts, cessation, and quit because of label. The regression models were estimated among relevant groups of participants. (For example, analysis of "high intensity smoking" is performed among current smokers only, whereas analysis of "quit because of label" is conducted exclusively among participants who were 'quit' at follow-up.) Two model specifications of each smoking behavior outcome were fitted to test for differences across measurement of label salience. Finally, in Table 4.6 we present results of regressions that estimated the association between smoking outcomes and exposure to graphic cigarette labeling after controlling for an interaction between label salience and loosies. All models controlled for wave-pair (i.e., time), cohort, sex, age group, urban/rural status, education, income, level of addiction (proxied by daily smoking intensity), smoking frequency, and type of cigarette smoked. Independent effects of adjustment variables are specified in relevant tables. Independent effects of control variables on smoking behaviors among *all adult smokers in Thailand* are

presented in Tables 4.7.a-f.; among *adult male* smokers in Tables 4.8.a-f.; and among *adult male smokers in Thailand and Malaysia* in Tables 4.9.a-f.

4.3.2. High Intensity Smoking

We found no significant association between high intensity smoking and label salience, except when examining loosies as an effect modifier. The odds of being a high intensity smoker (≥15 cigarettes per day) among male smokers in Thailand and Malaysia was *decreased* by approximately 63% among participants reporting any label salience and purchasing loosies, relative to those reporting *any* label salience and *not* purchasing loosies [OR=0.37, 95% CI (0.23, 0.60)]. Similarly, the odds of being a high intensity smoker among male smokers in Thailand and Malaysia was *decreased* by approximately 63% among participants reporting *high* label salience and purchasing loosies, relative to those reporting *high* label salience and *not* purchasing loosies [OR=0.37, 95% CI (0.20, 0.66)].

4.3.3. Reduced Smoking Intensity

The results of analyses that investigated the association between reduced smoking intensity and label salience were not significant among Thai smokers, nor among Southeast Asian smokers (Thai and Malaysian smokers combined).

4.3.4. Plan to Quit

The results of analyses that investigated the association between plan to quit and label salience were not significant among Thai smokers, nor among Southeast Asian smokers (Thai and Malaysian smokers combined).

4.3.5. Quit Attempt

With regard to making a quit attempt between baseline and follow-up waves, those who reported high label salience were significantly more likely to make a quit attempt than those reporting low salience among all smokers in Thailand [OR=1.28 (1.00, 1.64)], male smokers in Thailand [OR=1.29 (1.00, 1.66)], and male smokers in Southeast Asia [OR=1.25 (1.01, 1.55)].

4.3.6. Cessation

The results of analyses that investigated the association between cessation and label salience were not significant among Thai smokers, nor among Southeast Asian smokers (Thai and Malaysian smokers combined).

4.3.7. Quit because of label

Among baseline smokers who had quit at follow-up, the odds of attributing quit status to the graphic warning label was significantly higher among those reporting *any* label salience than those reporting *no* label salience among all quitters in Thailand [OR=1.62 (1.15, 2.29)] and male quitters in Thailand [OR=1.65 (1.17, 2.33)]. Additionally, the odds of attributing quit status to the graphic warning label was significantly higher among those reporting *high* label salience than those reporting *low* label salience among all quitters in Thailand [OR=1.36 (1.00, 1.86)] and male quitters in Thailand [OR=1.33 (1.01, 1.77)].

4.3.8. Moderating Effects of Loosies

Assessment of purchasing loosies as an effect modifier revealed that purchasing loosies did significantly moderate the association between: **high intensity smoking** and **attributing quit status to warning labels.** Specifically, purchasing loosies reduced odds of **high intensity smoking** among smokers in Thailand and Malaysia (versus those who did not purchase loosies) reporting *any label* salience [OR=0.37, 95% CI (0.23, 0.60)] and those reporting *high label* salience [OR= 0.37, 95% CI (0.20, 0.66)]. Purchasing loosies increased the odds of attributing quit status to warning labels among smokers in Thailand and Malaysia (versus those who did not purchase loosies) reporting *any label* salience [OR=1.42, 95% CI (1.02, 1.99)] and those reporting *high label* salience [OR= 1.51, 95% CI (1.02, 2.24)].

4.4. Discussion

This two-period longitudinal study examined the relationship between label salience and smoking behavior among adult smokers in Thailand and Malaysia. Prior research has already established the significant effect that graphic imagery has on label salience, and that label salience is predictive of quit attempts and cessation [15, 71, 94, 152]. However, previous research has focused on the changeover period from text-only to graphic warning labels, whereas this study examines salience of graphic warning labels solely in the *post*-policy implementation phase. The results of multivariable regression models

indicated that *any* salience was associated with increased odds of attributing **quit status to warning labels** among male smokers in Thailand and all adult smokers in Thailand (versus *no* salience). High salience was associated with increased odds of making a **quit attempt** among male smokers in Thailand, all smokers in Thailand, and male smokers in Thailand and Malaysia (versus *low* salience); and increased odds of attributing **quit status to warning labels** among male smokers in Thailand and all adult smokers in Thailand (versus *low* salience).

A secondary goal of our research was to assess the purchase of loosies as a potential effect modifier on label saliency due to its correlation with decreased exposure to the warning labels on cigarette packs. Some researchers have expressed concern that smokers may resort to covering cigarette packs or buying loosies as a defensive psychological mechanism [28, 30, 31] to avoid labels due to the fear evoked by graphic images [153]. As such, we hypothesized that purchasing loosies may reduce the impact of label saliency on smoking outcomes. However, our results indicate that purchasing loosies was actually associated with reduced odds of being a high-intensity smoker, as well as increased odds of attributing quit status to warning labels (among quitters). Previous studies have shown that some smokers purchase single cigarettes as a harm reduction strategy, and that using single cigarettes to reduce consumption is positively associated with quit intention [197]. However, the association between loosies*label salience and reduced smoking (between baseline and follow-up) was not significant, which indicates that smokers who purchase loosies may, generally, be lower intensity smokers than those who do not purchase loosies. Though we do not condone the sale of loose cigarettes, our results provide heartening evidence that the availability of single cigarettes, does not negate the effect of graphic cigarette warning labels as a tobacco control measure. Furthermore, the fact that quitters with high label salience who purchased loosies were more likely to attribute their quit status to warning labels (versus those who did not purchase loosies) further allays concerns that label salience is reduced by the purchase of loose cigarettes.

Our findings also suggest that our two variant measures of label salience (any v. no salience and high v. low salience) have seemingly comparable effects on smoking behavior, with the exception of quit attempts. *High* salience was significantly associated with increased odds of making a quit attempt between baseline and follow-up, as compared to *low* salience. The same association was not found when comparing *any* salience versus *no* salience. This indicates that the frequency with which people read

labels does appear to have an effect on certain smoking outcomes. It is plausible that 'ever' reading graphic warning labels is enough to affect behavioral change among a specific sub-population, perhaps people for whom graphic imagery evokes a more emotional response. Examples of such include those with firsthand experience with health effects of smoking, those receiving pressure from a child or a spouse, or those with a loved one who suffered or passed away from smoking-related disease. Further research is needed to better understand the factors that predict quit attempts and successful cessation among different sub-populations.

Furthermore, the influence of several demographic and social factors is revealed by our analyses—albeit as direct effects, rather than as mediators. With regard to ***country of residence***, living in Thailand as compared to Malaysia was associated with reduced odds of *reduced smoking intensity* among adult male smokers in model 1 [OR=0.33, 95% CI (0.14, 0.80] and model 2 [OR = 0.33, 95% CI (0.13, 0.80)]; decreased odds of *planning to quit* within 6 months among adult male smokers in model 1 [OR=0.47, 95% CI (0.33, 0.66)] and model 2 [OR=0.46, 95% CI (0.32, 0.65)]; increased odds of making a *quit attempt* in model 1 [OR=1.41, 95% CI (0.42, 1.95)], decreased odds of *cessation* in model 1 [OR=0.62, 95% CI (0.42, 0.92)] and model 2 [OR=0.63, 95% CI (0.42, 0.94)], and increased odds of attributing *quit status* to warning labels in model 1 [OR=3.35, 95% CI (2.32, 4.81)] and model 2 [OR=3.29, 95% CI (2.29, 4.72)]. With the exception of quit attempt, these country differences reveal that the graphic labels were more effective in Malaysia than in Thailand with regard to behavioral change. It is possible that the long history of anti-tobacco campaigns and policies in Thailand primed participants to the warning labels, while the novelty of the messages in Malaysia may have increased their impact and effectiveness [13, 151]. Interestingly, adults in Thailand were more likely to attribute their quit status to the warning labels than adults in Malaysia. It is possible that the labels effected behavioral change through mechanisms relating to social climate or social stigma surrounding tobacco use without smokers attributing the change to warning labels directly. 'Social denormalization,' a process that seeks 'to push tobacco out of the charmed circle of normal desirable practice to being an abnormal practice' [118], is widely regarded as essential to successful policy outcomes.

Other factors found to have a significant effect on smoking outcomes include: cohort, wave-pair, (time) sex, age, urban/rural status, education, income, smoking frequency, level of addiction (proxied by daily smoking intensity), type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy.

Cohort was associated with: *reduced smoking intensity* among all adult smokers in Thailand and male smokers in Southeast Asia; *plan to quit* among male smokers in Thailand and male smokers in Southeast Asia; *quit attempts* among males in Southeast Asia, and *quit because of label* among males in Thailand. **Wave-pair (time)** was associated with *quit attempt* among all adult smokers in Thailand and male smokers in Southeast Asia; and *quit because of* label among all adults in Thailand and males in Southeast Asia.

Sex was associated with *high intensity smoking* among adult smokers in Thailand; *plan to quit* among adult smokers in Thailand, and *quit because of label* among adult smokers in Southeast Asia. **Age** was associated with *high intensity smoking* among all smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia; *reduced smoking intensity* among all adult smokers in Thailand and adult smokers in Southeast Asia; *quit attempt* among male smokers in Southeast Asia*; cessation* among males in Southeast Asia*;* and *quit because of label* among all smokers in Thailand and male smokers in Thailand. **Urban/rural status** was associated with *quit attempt* among male smokers in Southeast Asia. **Education** was associated with *reduced smoking intensity* among male smokers in Thailand. **Income** was associated with *high intensity smoking* among all smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia; *plan to quit* among all smokers in Thailand and male smokers in Thailand; and *quit attempts* among male smokers in Thailand and male smokers in Southeast Asia.

Smoking frequency (daily v. non-daily smoking) was associated with *high intensity smoking* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia; *reduced smoking intensity* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia; *plan to quit* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia; *quit attempt* among all adult smokers in Thailand male smokers in Thailand, and male smokers in Southeast Asia; *cessation* among all adult smokers in Thailand and male smokers in Thailand; and *quit because of labels* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia. **Level of addiction**, proxied by daily smoking intensity,

was significantly associated with *plan to quit* among male smokers in Southeast Asia; *quit attempt* among all adult smokers in Thailand and male smokers in Southeast Asia; *cessation* among all adult smokers in Thailand and male smokers in Southeast Asia; and *quit because of labels* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia. **Type of cigarette smoked** (FM, RYO, or FM + RYO) was significantly associated with *high intensity smoking* among males in Southeast Asia; *reduced smoking intensity* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia; *cessation* among all adult smokers in Thailand and male smokers in Thailand; and *quit because of label* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia. **Noticed anti-smoking campaigns** was associated with *plan to quit* among male smokers in Thailand. Finally, **self-efficacy** was associated with *high intensity smoking* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia; *plan to quit* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast; *cessation* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia; and *quit because of labels* among all adult smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia.

This investigation builds on existing research in several notable ways. First, the use of seven years of data allows us to circumvent the undue influence of extraneous policy events and generate sufficient person-wave observations to control for several relevant sociodemographic and smokingspecific variables. Second, to our knowledge, this is the first study to examine the post-implementation adult response to graphic warning labels in Malaysia. Third, our examination of the effect of warning labels on behavioral *outcomes* builds upon previous studies of behavioral *intention.* Lastly, our investigation of the moderating effects of loosies is novel, and extremely relevant, given the popularity of loose cigarettes (over 20% of our Thai sample reported buying loose cigarettes at baseline) and concerns over the effect of loosies as an avoidance tactic. We should note, however, that although we did control for income, this investigation did not directly assess the potential economic influences driving the purchase of loosies, which may be an important predictor of lower smoking intensity.

There are, nevertheless, limitations that should be noted. First, the relatively small size of our Malaysian sample hindered our ability to conduct Malaysia-specific analyses. Instead, after ensuring there were no significant country-by-predictor interaction terms, we combined data from both countries. Similarly, the small number of female smokers in our sample, while representative of smoking trends in Southeast Asia, prevented us from stratifying analyses by gender.

Additionally, we cannot be certain that extraneous tobacco control efforts and policies did not affect our smoking outcomes. In an effort to partially control for other sources of anti-tobacco information, we included a measure of noticing anti-smoking campaigns through multiple modalities (television, radio, billboard, etc.), which may have resolved some of these external influences. Furthermore, we do not account for changes to the graphic warning label policy in Thailand, including the introduction of a new set of graphic warning labels in February 2007, between waves 2 and 3, which likely impacted label salience. Previous research has shown that novelty effects impact overall salience, as well as stimulate cognitive and behavioral reactions [14, 71, 120]. Additionally, our measure of loosies was assessed by asking participants about the source of the *last cigarette* they smoked. It is unclear how frequently they purchase loose cigarettes, or if loosies are their usual form of purchase. Lastly, though our population was replenished at every wave, we do not account for dropout in our analyses. A weighted generalized estimating equation (GEE) approach may be more appropriate for datasets prone to missing observations, as they extend the traditional GEE approach to better account for dropout [183], assuming that data are missing at random.

In summary, graphic cigarette warning label salience is associated with increased odds of reduced smoking intensity, as well as increased odds of making a quit attempt. It is likely that reading warning labels has more immediate effects on certain sub-populations for whom the labels trigger a more pronounced emotional response. Future research is needed to better understand additional factors that mediate the effect of label salience on quitting behavior. Our results support the notion that reading warning labels more frequently positively impacts smoking outcomes; as such, efforts should be made to increase salience through the introduction of new graphics and messages, as novelty effects have been shown to increase warning label salience [13, 151]. With over 50% of the world's smokers living in Asia [79], it is imperative that we promote anti-tobacco efforts in this region and make global tobacco control a

priority. Understanding the mechanisms through which graphic warning labels effect, and sustain, behavioral change is critical to enhancing their impact on population health.

Table 4.1. Data collection dates and adult sample composition for ITC-SEA surveys in Malaysia and Thailand.

	ITC-SEA Malaysia Survey Collection		ITC-SEA Thailand Survey Collection	
Wave	**Survey Dates**	**Sample Composition**	**Survey Dates**	**Sample Composition**
1	Jan – Mar 2005	2,004 Smokers	Jan – Mar 2005	2,048 Smokers
2	Jul 2006 – Jun 2007	1,640 Smokers and Quitters	Aug – Sept 2006	2,158 Smokers and Quitters
3	Feb – Sept 2008	1,957 Smokers and Quitters	Jan – Mar 2008	2,607 Smokers and Quitters
4	Jul – Nov 2009	2,045 Smokers and Quitters	Apr – July 2009	2,430 Smokers and Quitters
5	May 2011 – Apr 2012	2,007 Smokers and Quitters	Feb – Apr 2011	2,175 Smokers and Quitters

Figure 4.1. Timeline of tobacco policies and ITC surveys in Malaysia, 2004 – 2012



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Figure 4.2. Timeline of tobacco policies and ITC surveys in Thailand, 2004 – 2012.



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Table 4.2. Sample description: weighted frequencies and percentages by country and smoke

		Malaysia	Thailand
		Total (n=1512)	**Total (n=5393)**
Smoking intensity at baseline	<5 cigarettes/day	180 (12.75%)	1303 (27.96%)
	6-15 cigarettes/day	740 (52.34%)	1532 (32.89%)
	15+ cigarettes/day	494 (34.90%)	1824 (39.15%)
Cigarettes per day at baseline	Mean (SE)	13.18 (0.29)	11.14 (0.61)
Smoking intensity at follow-up	<5 cigarettes/day	210 (18.25%)	1144 (27.18%)
	6-15 cigarettes/day	579 (50.20%)	1482 (35.19%)
	15+ cigarettes/day	364 (31.55%)	1585 (37.63%)
Cigarettes per day at follow-up	Mean (SE)	11.93 (0.30)	10.91 (0.56)
Cessation (quit at follow-up)		146 (9.66%)	522 (9.68%)
Sex	Male	1493 (98.71%)	5117 (94.87%)
Religion	Islamic	502 (97.11%)	23 (0.99%)
	Buddhist	3 (0.64%)	2253 (98.82%)
	Other religion	12 (2.25%)	4 (0.19%)
Ethnicity (Major/Minor Group)	Major group	1234 (82.02%)	5330 (98.83%)
Urban/rural	Urban	983 (64.98%)	1379 (25.56%)
Age group	18-24 years	530 (35.67%)	238 (4.42%)
	25-39 years	490 (32.97%)	1194 (22.13%)
	40-54 years	330 (22.19%)	2222 (41.21%)
	55+ years	136 (9.17%)	11739 (32.24%)
Education	Low	18 (1.25%)	531 (10.19%)
	Moderate	817 (56.65%)	4338 (83.26%)
	High	608 (42.11%)	341 (6.55%)
Income	Low	250 (20.02%)	2565 (49.54%)
	Moderate	608 (48.73%)	1853 (35.78%)
	High	390 (31.25%)	760 (14.68%)
Type of smoker (Daily/Non-Daily)	Daily smoker	1310 (92.46%)	4079 (86.90%)
Type of cigarettes smoked	FM	1282 (90.51%)	1755 (37.40%)

	RYO	81 (5.70%)	2257 (48.10%)
	Both FM + RYO	54 (3.78%)	679 (14.46%)
Label Salience (high v. low salience)	Never/rarely	675 (47.08%)	1956 (42.68%)
	Often/very often	659 (52.92%)	2627 (57.32%)
Label Salience (ever v. never read labels)	Never	76 (5.29%)	461 (10.06%)
	Rarely/often/very often	1359 (94.71%)	4121 (89.94%)
Plan to quit	<1 month	189 (12.52%)	263 (6.03%)
	<6 months	251 (16.59%)	622 (14.26%)
	>6 months	320 (21.14%)	842 (19.31%)
	No plan to quit	752 (49.75%)	2634 (60.40%)
Purchased loose cigarettes	Yes	48 (3.36%)	619 (22.04%)
Quitting Self-Efficacy (High/Low)	High confidence	585 (43.19%)	1357 (29.21%)
Cohort	Recruited at wave 1	494 (32.67%)	3524 (65.35%)
	Recruited at wave 2	280 (18.52%)	966 (17.91%)
	Recruited at wave 3	221 (14.62%)	741 (13.75%)
	Recruited at wave 4	517 (34.19%)	161 (2.99%)
Wave-pair	Wave-pair 2	-	1710 (31.71%)
	Wave-pair 3	-	1818 (33.72%)
	Wave-pair 4	1512 (100%)	1865 (34.58%)

Table 4.3. GEE results: smoking outcomes among all adult smokers in Thailand by salience of labels

	Model 1[a] OR (95% CI)	Model 2[b] OR (95% CI)
High smoking intensity	0.99 (0.72, 1.37)	1.01 (0.84, 1.22)
Reduce smoking intensity	1.58 (0.68, 3.67)	1.29 (0.79, 2.08)
Plan to quit (<6 mo)	1.11 (0.77, 1.60)	1.13 (0.88, 1.47)
Quit attempts	1.12 (0.87, 1.43)	1.28 (1.00, 1.64)*
Cessation	1.05 (0.59, 1.84)	0.85 (0.65, 1.10)
Quit because of label	1.62 (1.15, 2.29)**	1.36 (1.00, 1.86)*

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Defined as smoking 15+ cigarettes per day

[d]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, level of addiction, smoking frequency, and type of cigarette smoked *p<0.05; **p<0.01; ***p<0.001

Table 4.4. GEE results: smoking outcomes among male adult smokers in Thailand by salience of labels

	Model 1[a] OR (95% CI)	Model 2[b] OR (95% CI)
High smoking intensity	1.00 (0.72, 1.37)	1.00 (0.83, 1.21)
Reduce smoking intensity	1.56 (0.64, 3.82)	1.30 (0.80, 2.12)
Plan to quit (<6 mo)	1.13 (0.79, 1.62)	1.11 (0.85, 1.45)
Quit attempts	1.10 (0.86, 1.41)	1.29 (1.00, 1.66)*
Cessation	0.96 (0.56, 1.63)	0.85 (0.65, 1.13)
Quit because of label	1.65 (1.17, 2.33)**	1.33 (1.01, 1.77)*

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Defined as smoking 15+ cigarettes per day
[d]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, level of addiction, smoking frequency, and type of cigarette smoked *p<0.05; **p<0.01; ***p<0.001

Table 4.5. GEE results: smoking outcomes among adult male smokers in Thailand and Malaysia by salience of labels

	Model 1[a] OR (95% CI)	Model 2[b] OR (95% CI)
High smoking intensity	0.93 (0.68, 1.27)	0.99 (0.83, 1.17)
Reduce smoking intensity	1.40 (0.64, 3.10)	1.15 (0.74, 1.77)
Plan to quit (<6 mo)	1.12 (0.77, 1.63)	1.17 (0.92, 1.48)
Quit attempts	1.08 (0.84, 1.40)	1.25 (1.01, 1.55)*
Cessation	1.10 (0.68, 1.79)	0.84 (0.65, 1.08)
Quit because of label	1.35 (0.94, 1.94)	1.07 (0.84, 1.37)

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Defined as smoking 15+ cigarettes per day
[d]Models adjusted for wave-pair, cohort, country, sex, age group, urban/rural status, education, income, level of addiction, smoking frequency, and type of cigarette smoked
*p<0.05; **p<0.01; ***p<0.001

Table 4.6. GEE results: Interaction between label salience and purchasing loose cigarette, and the impact on smoking outcomes among adult male smokers in Thailand and Malaysia

	Model 1[a] OR (95% CI)	Model 2[b] OR (95% CI)
High smoking intensity	0.37 (0.23, 0.60)***	0.37 (0.20, 0.66)***
Reduce smoking intensity	1.33 (0.92, 1.91)	1.31 (0.87, 1.98)
Plan to quit (<6 mo)	1.08 (0.83, 1.42)	1.17 (0.79, 1.73)
Quit attempts	1.08 (0.83, 1.42)	1.07 (0.79, 1.44)
Cessation	1.04 (0.74, 1.46)	1.24 (0.88, 1.76)
Quit because of label	1.42 (1.02, 1.99)*	1.51 (1.02, 2.24)*

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref]; interaction term compares salience*buying loosies v. salience*not buying loosies [ref]
[b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref]; interaction term compares high salience*buying loosies v. high salience*not buying loosies [ref] [c]Defined as smoking 15+ cigarettes per day
[d]Models adjusted for wave-pair, cohort, country, sex, age group, urban/rural status, education, income, level of addiction, smoking frequency, and type of cigarette smoked *p<0.05; **p<0.01; ***p<0.001

Table 4.7.a. Independent effects of covariates on high intensity smoking among all adult smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.85 (0.25, 2.92)	0.84 (0.22, 3.21)
Label salience	β_1	0.99 (0.72, 1.37)	1.01 (0.84, 1.22)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.65 (0.35, 1.20)	0.65 (0.36, 1.20)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.14 (0.86, 1.50)	1.14 (0.86, 1.51)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.42 (0.91, 2.22)	1.42 (0.91, 2.23)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.01 (0.85, 1.19)	1.01 (0.84, 1.20)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.06 (0.90, 1.26)	1.06 (0.90, 1.26)
Demographic variables			
Sex [ref=male]	β_7	0.26 (0.13, 0.50)***	0.26 (0.13, 0.50)***
Age group [55+ v. 18-24 (ref)]]	β_8	1.49 (0.86, 2.55)	1.48 (0.86, 2.55)
[40-54 v. 18-24 (ref)]]	β_9	2.45 (1.48, 4.07)***	2.45 (1.47, 4.07)***
[25-39 v. 18-24 (ref)]]	β_{10}	2.42 (1.28, 4.57)***	2.41 (1.28, 4.55)***
Urban/rural status [ref=rural]	β_{11}	1.08 (0.68, 1.71)	1.08 (0.68, 1.71)
Education [high v. low (ref)]]	β_{12}	0.95 (0.50, 1.82)	0.95 (0.50, 1.80)
[moderate v. low (ref)]]	β_{13}	0.92 (0.56, 1.53)	0.92 (0.56, 1.51
Income [high v. low (ref)]]	β_{14}	1.39 (1.05, 1.85)*	1.39 (1.04, 1.86)*
[moderate v. low (ref)]]	β_{15}	1.16 (0.98, 1.37)	1.16 (0.98, 1.38)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	0.34 (0.18, 0.64)***	0.34 (0.18, 0.64)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{17}	0.91 (0.69, 1.20)	0.91 (0.69, 1.21)
[RYO v. FM (ref)]]	β_{18}	0.73 (0.52, 1.03)	0.74 (0.52, 1.05)
Noticed anti-smoking campaign	β_{19}	0.81 (0.56, 1.16)	0.81 (0.57, 1.15)
Self-efficacy [high v. low (ref)]	β_{20}	0.72 (0.62, 0.84)***	0.72 (0.62, 0.83)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.7.b. Independent effects of covariates on reduce smoking intensity among all adult smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	5.68 (0.45, 7.43)	7.12 (0.55, 9.42)
Label salience	β_1	1.58 (0.68, 3.67)	1.29 (0.79, 2.08)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.30 (0.29, 5.89)	1.34 (0.30, 6.03)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.00 (0.45, 2.23)	1.00 (0.45, 2.22)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.99 (1.01, 3.95)*	1.99 (1.00, 3.98)*
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.48 (0.60, 3.63)	1.50 (0.61, 3.66)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.47 (0.70, 3.08)	1.52 (0.72, 3.19)
Demographic variables			
Sex [ref=male]	β_7	1.42 (0.52, 3.90)	1.41 (0.53, 3.81)

Age group [55+ v. 18-24 (ref)]]	β_8	8.08 (1.90, 34.40)**	7.88 (1.87, 33.26)**
[40-54 v. 18-24 (ref)]]	β_9	2.64 (0.86, 8.06)	2.56 (0.85, 7.65)
[25-39 v. 18-24 (ref)]]	β_{10}	1.48 (0.62, 3.54)	1.44 (0.60, 3.47)
Urban/rural status [ref=rural]	β_{11}	1.23 (0.74, 2.04)	1.25 (0.74, 2.09)
Education [high v. low (ref)]]	β_{12}	0.24 (0.04, 1.61)	0.25 (0.04, 1.56)
[moderate v. low (ref)]]	β_{13}	0.25 (0.06, 1.08)	0.26 (0.06, 1.06)
Income [high v. low (ref)]]	β_{14}	1.24 (0.65, 2.37)	1.27 (0.66, 2.45)
[moderate v. low (ref)]]	β_{15}	0.99 (0.53, 1.86)	1.00 (0.53, 1.89)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	3.63 (1.34, 9.80)**	3.69 (1.42, 9.55)**
Type of cigarette [FM+RYO v. FM (ref)]]	β_{17}	0.98 (0.53, 1.81)	0.98 (0.54, 1.79)
[RYO v. FM (ref)]]	β_{18}	3.44 (1.84, 6.42)***	3.57 (1.90, 6.73)***
Noticed anti-smoking campaign	β_{19}	1.24 (0.36, 4.27)	1.24 (0.36, 4.25)
Self-efficacy [high v. low (ref)]	$\hat{a}_{20}$	1.65 (0.92, 2.98)	1.61 (0.86, 3.00)

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.7.c. Independent effects of covariates on plan to quit among all adult smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.11 (0.04, 0.31)	0.11 (0.04, 0.30)
Label salience	β_1	1.11 (0.77, 1.60)	1.13 (0.88, 1.47)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.56 (0.98, 2.48)	1.60 (1.00, 2.56)
[recruited wave 3 v. wave 1 (ref)]	β_3	0.95 (0.72, 1.26)	0.97 (0.73, 1.28)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.12 (0.92, 1.37)	1.13 (0.93, 1.38)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.84 (0.65, 1.10)	0.85 (0.65, 1.10)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.18 (0.84, 1.67)	1.19 (0.84, 1.69)
Demographic variables			
Sex [ref=male]	β_7	0.60 (0.38, 0.94)*	0.60 (0.39, 0.94)*
Age group [55+ v. 18-24 (ref)]]	β_8	1.45 (0.79, 2.68)	1.44 (0.78, 2.67)
[40-54 v. 18-24 (ref)]]	β_9	1.26 (0.67, 2.34)	1.24 (0.66, 2.32)
[25-39 v. 18-24 (ref)]]	β_{10}	0.97 (0.57, 1.63)	0.95 (0.57, 1.61)
Urban/rural status [ref=rural]	β_{11}	1.33 (0.95, 1.85)	1.33 (0.96, 1.85)
Education [high v. low (ref)]]	β_{12}	0.76 (0.40, 1.46)	0.76 (0.40, 1.46)
[moderate v. low (ref)]]	β_{13}	0.73 (0.45, 1.16)	0.73 (0.45, 1.17)
Income [high v. low (ref)]]	β_{14}	0.76 (0.52, 1.10)	0.76 (0.52, 1.11)
[moderate v. low (ref)]]	β_{15}	0.73 (0.59, 0.91)**	0.74 (0.60, 0.91)**
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	2.25 (1.38, 3.66)***	2.27 (1.38, 3.71)***
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{17}	0.69 (0.48, 0.99)	0.69 (0.48, 1.00)
[15+ v. ≤5 cigs/day (ref)]	β_{18}	0.95 (0.77, 1.18)	0.95 (0.76, 1.19)

Type of cigarette [FM+RYO v. FM (ref)]]	β_{19}	1.12 (0.83, 1.52)	1.13 (0.84, 1.53)
[RYO v. FM (ref)]]	β_{20}	0.94 (0.68, 1.30)	0.96 (0.69, 1.34)
Noticed anti-smoking campaign	β_{21}	1.96 (1.14, 3.38)	1.94 (1.11, 3.39)
Self-efficacy [high v. low (ref)]	β_{22}	1.75 (1.49, 2.06)***	1.73 (1.46, 2.04)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy
*p<0.05; **p<0.01; ***p<0.001

Table 4.7.d. Independent effects of covariates on quit attempt among all adult smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	4.47 (2.32, 8.63)	4.31 (2.28, 8.15)
Label salience	β_1	1.12 (0.87, 1.43)	1.28 (1.00, 1.64)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.01 (0.62, 1.64)	1.04 (0.64, 1.68)
[recruited wave 3 v. wave 1 (ref)]	β_3	0.96 (0.67, 1.36)	0.97 (0.68, 1.40)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.94 (0.80, 1.11)	0.95 (0.80, 1.13)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.61 (0.50, 0.74)***	0.61 (0.50, 0.74)***
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.63 (0.46, 0.85)***	0.64 (0.47, 0.86)***
Demographic variables			
Sex [ref=male]	β_7	1.24 (0.82, 1.86)	1.24 (0.82, 1.87)
Age group [55+ v. 18-24 (ref)]]	β_8	0.99 (0.64, 1.52)	0.98 (0.64, 1.50)
[40-54 v. 18-24 (ref)]]	$\hat{\beta}_9$	1.13 (0.73, 1.73)	1.10 (0.73, 1.67)
[25-39 v. 18-24 (ref)]]	β_{10}	0.95 (0.61, 1.49)	0.94 (0.60, 1.45)
Urban/rural status [ref=rural]	β_{11}	1.35 (0.93, 1.97)	1.36 (0.93, 1.97)
Education [high v. low (ref)]]	β_{12}	0.62 (0.33, 1.18)	0.61 (0.33, 1.14)
[moderate v. low (ref)]]	β_{13}	0.66 (0.41, 1.08)	0.66 (0.41, 1.06)
Income [high v. low (ref)]]	β_{14}	1.07 (0.66, 1.75)	1.08 (0.66, 1.77)
[moderate v. low (ref)]]	β_{15}	0.77 (0.62, 0.96)*	0.77 (0.62, 0.97)*
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	3.02 (2.01, 4.53)***	3.04 (2.02, 4.58)***
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{17}	0.44 (0.34, 0.55)***	0.44 (0.34, 0.56)***
[15+ v. ≤5 cigs/day (ref)]	β_{18}	0.64 (0.53, 0.79)***	0.65 (0.53, 0.79)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{19}	1.00 (0.77, 1.30)	1.01 (0.77, 1.33)
[RYO v. FM (ref)]]	β_{20}	0.87 (0.66, 1.14)	0.91 (0.69, 1.19)
Noticed anti-smoking campaign	β_{21}	1.35 (0.86, 2.12)	1.32 (0.84, 2.10)
Self-efficacy [high v. low (ref)]	β_{22}	1.17 (0.91, 1.51)	1.15 (0.89, 1.47)

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy
*p<0.05; **p<0.01; ***p<0.001

		Model 1[a]	Model 2[b]
Constant	β_0	0.03 (0.01, 0.11)	0.03 (0.01, 0.15)
Label salience	β_1	1.05 (0.59, 1.84)	0.85 (0.65, 1.10)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.81 (0.42, 1.54)	0.79 (0.41, 1.52)
[recruited wave 3 v. wave 1 (ref)]	β_3	0.86 (0.54, 1.39)	0.85 (0.53, 1.38)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.49 (0.96, 2.33)	1.47 (0.95, 2.27)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.02 (0.68, 1.53)	1.01 (0.67, 1.53)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.98 (0.68, 1.42)	0.97 (0.68, 1.40)
Demographic variables			
Sex [ref=male]	β_7	0.91 (0.58, 1.44)	0.89 (0.54, 1.47)
Age group [55+ v. 18-24 (ref)]]	β_8	2.80 (0.84, 9.35)	2.90 (0.91, 9.25)
[40-54 v. 18-24 (ref)]]	β_9	1.74 (0.46, 6.66)	1.83 (0.51, 6.59)
[25-39 v. 18-24 (ref)]]	β_{10}	1.48 (0.33, 6.62)	1.55 (0.37, 6.50)
Urban/rural status [ref=rural]	β_{11}	1.13 (0.72, 1.79)	1.14 (0.72, 1.80)
Education [high v. low (ref)]]	β_{12}	1.63 (0.62, 4.28)	1.64 (0.63, 4.28)
[moderate v. low (ref)]]	β_{13}	1.24 (0.60, 2.58)	1.25 (0.61, 2.57)
Income [high v. low (ref)]]	β_{14}	0.96 (0.61, 1.52)	0.97 (0.62, 1.53)
[moderate v. low (ref)]]	β_{15}	1.00 (0.71, 1.41)	1.00 (0.71, 1.40)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	2.24 (1.53, 3.30)***	2.26 (1.55, 3.30)***
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{17}	0.81 (0.53, 1.25)	0.81 (0.53, 1.23)
[15+ v. ≤5 cigs/day (ref)]	β_{18}	0.70 (0.54, 0.91)	0.70 (0.54, 0.91)*
Type of cigarette [FM+RYO v. FM (ref)]]	β_{19}	0.70 (0.44, 1.11)	0.69 (0.44, 1.09)
[RYO v. FM (ref)]]	β_{20}	0.78 (0.62, 0.98)**	0.74 (0.59, 0.94)***
Noticed anti-smoking campaign	β_{21}	1.57 (0.80, 3.07)	1.59 (0.82, 3.08)
Self-efficacy [high v. low (ref)]	β_{22}	1.79 (1.34, 2.40)***	1.82 (1.36, 2.42)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref]

Table 4.7.e. Independent effects of covariates on cessation among all adult smokers in Thailand[c]

[b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy

*p<0.05; **p<0.01; ***p<0.001

Table 4.7.f. Independent effects of covariates on quit because of label among all adult smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	5.00 (2.25, 11.11)	6.24 (2.61, 14.88)
Label salience	β_1	1.62 (1.15, 2.29)**	1.36 (1.00, 1.86)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.66 (0.30, 1.41)	0.68 (0.32, 1.45)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.46 (1.00, 2.13)	1.48 (0.99, 2.20)

[recruited wave 2 v. wave 1 (ref)]	β_4	0.82 (0.60, 1.13)	0.83 (0.60, 1.13)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.70 (0.53, 0.91)*	0.72 (0.54, 0.95)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.80 (0.50, 1.29)	0.83 (0.52, 1.31)
Demographic variables			
Sex [ref=male]	β_7	0.38 (0.18, 0.80)**	0.38 (0.18, 0.78)**
Age group [55+ v. 18-24 (ref)]]	β_8	0.87 (0.46, 1.63)	0.86 (0.46, 1.60)
[40-54 v. 18-24 (ref)]]	β_9	1.70 (1.05, 2.76)**	1.69 (1.06, 2.71)**
[25-39 v. 18-24 (ref)]]	β_{10}	1.48 (0.89, 2.45)	1.48 (0.91, 2.42)
Urban/rural status [ref=rural]	β_{11}	1.16 (0.79, 1.69)	1.16 (0.80, 1.69)
Education [high v. low (ref)]]	β_{12}	0.95 (0.44, 2.05)	0.96 (0.45, 2.07)
[moderate v. low (ref)]]	β_{13}	0.82 (0.44, 1.51)	0.84 (0.46, 1.53)
Income [high v. low (ref)]]	β_{14}	0.80 (0.50, 1.28)	0.81 (0.51, 1.29)
[moderate v. low (ref)]]	β_{15}	0.87 (0.65, 1.17)	0.87 (0.65, 1.16)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	3.91 (1.87, 8.14)***	3.96 (1.90, 8.24)***
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{17}	0.53 (0.37, 0.77)**	0.53 (0.36, 0.77)**
[15+ v. ≤5 cigs/day (ref)]	β_{18}	0.64 (0.48, 0.87)**	0.64 (0.47, 0.86)**
Type of cigarette [FM+RYO v. FM (ref)]]	β_{19}	1.25 (0.88, 1.78)	1.28 (0.89, 1.82)
[RYO v. FM (ref)]]	β_{20}	1.64 (1.27, 2.14)**	1.71 (1.35, 2.17)**
Noticed anti-smoking campaign	β_{21}	1.35 (0.69, 2.65)	1.33 (0.69, 2.60)
Self-efficacy [high v. low (ref)]	β_{22}	1.52 (1.13, 2.05)**	1.49 (1.12, 1.98)**

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy
*p<0.05; **p<0.01; ***p<0.001

Table 4.8.a. Independent effects of covariates on high intensity smoking among adult male smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.76 (0.22, 2.68)	0.76 (0.20, 2.95)
Label salience	β_1	1.00 (0.72, 1.37)	1.00 (0.83, 1.21)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.65 (0.35, 1.21)	0.65 (0.36, 1.20)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.15 (0.86, 1.52)	1.15 (0.86, 1.53)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.44 (0.91, 2.28)	1.44 (0.91, 2.29)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.00 (0.84, 1.19)	1.00 (0.83, 1.20)
[wave-pair 3 v. wave-pair 2 (ref)]	$\hat{a}_6$	1.06 (0.89, 1.25)	1.06 (0.89, 1.26)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_7	1.51 (0.86, 2.65)	1.51 (0.86, 2.65)
[40-54 v. 18-24 (ref)]]	β_8	2.51 (1.48, 4.26)***	2.51 (1.48, 4.26)***
[25-39 v. 18-24 (ref)]]	β_9	2.49 (1.30, 4.76)***	2.48 (1.30, 4.76)***
Urban/rural status [ref=rural]	β_{10}	1.10 (0.70, 1.74)	1.10 (0.70, 1.74)
Education [high v. low (ref)]]	β_{11}	0.96 (0.50, 1.83)	0.95 (0.50, 1.82)

[moderate v. low (ref)]]	β_{12}	0.94 (9.57, 1.56)	0.94 (0.57, 1.55)
Income [high v. low (ref)]]	β_{13}	1.41 (1.06, 1.88)*	1.41 (1.06, 1.88)*
[moderate v. low (ref)]]	β_{14}	1.18 (1.00, 1.40)*	1.18 (0.99, 1.40)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{15}	0.34 (0.18, 0.66)***	0.34 (0.18, 0.65)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{16}	0.90 (0.68, 1.18)	0.90 (0.68, 1.19)
[RYO v. FM (ref)]]	β_{17}	0.75 (0.53, 1.07)	0.75 (0.52, 1.09)
Noticed anti-smoking campaign	β_{18}	0.81 (0.56, 1.16)	0.81 (0.57, 1.15)
Self-efficacy [high v. low (ref)]	β_{19}	0.73 (0.63, 0.85)***	0.73 (0.63, 0.85)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.8.b. Independent effects of covariates on reduce smoking intensity among adult male smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	5.68 (1.04, 36.03)	9.62 (1.31, 37.53)
Label salience	β_1	1.56 (0.64, 3.82)	1.30 (0.80, 2.12)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.29 (0.28, 5.93)	1.32 (0.29, 6.07)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.04 (0.47, 2.27)	1.03 (0.47, 2.27)
[recruited wave 2 v. wave 1 (ref)]	β_4	2.14 (1.10, 4.17)	2.14 (1.08, 4.21)*
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.46 (0.60, 3.55)	1.47 (0.60, 3.59)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.45 (0.70, 3.00)	1.50 (0.72, 3.13)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_7	8.70 (2.15, 35.21)***	8.47 (2.10, 34.08)**
[40-54 v. 18-24 (ref)]]	β_8	2.68 (0.87, 8.19)	2.57 (0.86, 7.71)
[25-39 v. 18-24 (ref)]]	β_9	1.53 (0.63, 3.70)	1.48 (0.61, 3.62)
Urban/rural status [ref=rural]	β_{10}	1.24 (0.74, 2.06)	1.26 (0.75, 2.11)
Education [high v. low (ref)]]	β_{11}	0.08 (0.01, 1.31)	0.08 (0.01, 1.31)
[moderate v. low (ref)]]	β_{12}	0.09 (0.01, 0.93)	0.09 (0.01, 0.94)*
Income [high v. low (ref)]]	β_{13}	1.20 (0.62, 2.30)	1.22 (0.63, 2.39)
[moderate v. low (ref)]]	β_{14}	0.96 (0.50, 1.84)	0.96 (0.49, 1.86)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{15}	3.65 (1.33, 10.03)**	3.69 (1.41, 9.69)**
Type of cigarette [FM+RYO v. FM (ref)]]	β_{16}	0.99 (0.56, 1.76)	0.99 (0.57, 1.74)
[RYO v. FM (ref)]]	β_{17}	3.38 (1.75, 6.53)***	3.51 (1.81, 6.82)***
Noticed anti-smoking campaign	β_{18}	1.29 (0.37, 4.45)	1.28 (0.37, 4.45)
Self-efficacy [high v. low (ref)]	β_{19}	1.69 (0.93, 3.07)	1.64 (0.8, 3.08)

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking

frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.8.c. Independent effects of covariates on plan to quit among adult male smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.10 (0.04, 0.31)	0.11 (0.04, 0.32)
Label salience	β_1	1.13 (0.79, 1.62)	1.11 (0.85, 1.45)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	1.59 (1.00, 2.53)	1.62 (1.01, 2.59)*
[recruited wave 3 v. wave 1 (ref)]	β_3	0.98 (0.74, 1.31)	0.99 (0.74, 1.33)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.15 (0.94, 1.40)	1.15 (0.95, 1.40)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.85 (0.65, 1.10)	0.85 (0.65, 1.11)
[wave-pair 3 v. wave-pair 2 (ref)]	$\hat{\beta}_6$	1.18 (0.83, 1.68)	1.19 (0.83, 1.71)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_7	1.43 (0.77, 2.64)	1.42 (0.76, 2.64)
[40-54 v. 18-24 (ref)]]	β_8	1.25 (0.68, 2.30)	1.24 (0.66, 2.30)
[25-39 v. 18-24 (ref)]]	β_9	0.96 (0.57, 1.61)	0.95 (0.57, 1.60)
Urban/rural status [ref=rural]	β_{10}	1.33 (0.95, 1.85)	1.33 (0.96, 1.85)
Education [high v. low (ref)]]	β_{11}	0.77 (0.40, 1.50)	0.78 (0.40, 1.50)
[moderate v. low (ref)]]	β_{12}	0.73 (0.45, 1.18)	0.73 (0.45, 1.20)
Income [high v. low (ref)]]	β_{13}	0.75 (0.50, 1.11)	0.75 (0.50, 1.12)
[moderate v. low (ref)]]	β_{14}	0.74 (0.59, 0.91)*	0.74 (0.60, 0.91)*
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{15}	2.22 (1.35, 3.65)***	2.24 (1.35, 3.72)*
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{16}	0.67 (0.47, 0.96)	0.67 (0.47, 0.96)
[15+ v. ≤5 cigs/day (ref)]	β_{17}	0.91 (0.73, 1.13)	0.91 (0.73, 1.13)
Type of cigarette [FM+RYO v. FM (ref)]]	β_{18}	1.15 (0.86, 1.55)	1.16 (0.86, 1.56)
[RYO v. FM (ref)]]	β_{19}	0.96 (0.70, 1.31)	0.97 (0.71, 1.34)
Noticed anti-smoking campaign	β_{20}	2.03 (1.10, 3.75)*	2.01 (1.08, 3.76)*
Self-efficacy [high v. low (ref)]	β_{21}	1.75 (1.48, 2.06)***	1.73 (1.46, 2.05)*

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy
*p<0.05; **p<0.01; ***p<0.001

Table 4.8.d. Independent effects of covariates on quit attempts among adult male smokers in

Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	4.55 (2.36, 8.80)	4.32 (2.31, 8.09)
Label salience	β_1	1.10 (0.86, 1.41)	1.29 (1.00, 1.66)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.99 (0.62, 1.61)	1.02 (0.63, 1.65)
[recruited wave 3 v. wave 1 (ref)]	β_3	0.95 (0.66, 1.37)	0.97 (0.67, 1.41)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.94 (0.78, 1.13)	0.95 (0.78, 1.15)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.61 (0.49, 0.75)***	0.61 (0.50, 0.74)***
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.63 (0.46, 0.86)***	0.63 (0.46, 0.87)***
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_7	0.96 (0.60, 1.52)	0.95 (0.60, 1.49)
[40-54 v. 18-24 (ref)]]	β_8	1.10 (0.71, 1.71)	1.07 (0.70, 1.64)
[25-39 v. 18-24 (ref)]]	β_9	0.91 (0.57, 1.46)	0.90 (0.57, 1.42)
Urban/rural status [ref=rural]	β_{10}	1.36 (0.95, 1.95)	1.37 (0.96, 1.95)
Education [high v. low (ref)]]	β_{11}	0.61 (0.32, 1.18)	0.60 (0.32, 1.14)
[moderate v. low (ref)]]	β_{12}	0.68 (0.41, 1.13)	0.67 (0.41, 1.11)
Income [high v. low (ref)]]	β_{13}	1.05 (0.65, 1.69)	1.06 (0.66, 1.71)
[moderate v. low (ref)]]	β_{14}	0.74 (0.60, 0.92)**	0.75 (0.60, 0.92)**
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{15}	2.87 (1.87, 4.41)***	2.90 (1.89, 4.45)***
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{16}	0.44 (0.35, 0.56)***	0.45 (0.35, 0.57)***
[15+ v. ≤5 cigs/day (ref)]	β_{17}	0.64 (0.52, 0.80)***	0.64 (0.52, 0.80)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{18}	1.00 (0.78, 1.29)	1.02 (0.78, 1.31)
[RYO v. FM (ref)]]	β_{19}	0.85 (0.64, 1.13)	0.89 (0.67, 1.18)
Noticed anti-smoking campaign	β_{20}	1.39 (0.88, 2.21)	1.36 (0.85, 2.18)
Self-efficacy [high v. low (ref)]	β_{21}	1.18 (0.93, 1.51)	1.16 (0.91, 1.47)

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy
*p<0.05; **p<0.01; ***p<0.001

Table 4.8.e. Independent effects of covariates on cessation among adult male smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.03 (0.01, 0.12)	0.03 (0.01, 0.15)
Label salience	β_1	0.96 (0.56, 1.63)	0.85 (0.65, 1.13)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.81 (0.41, 1.60)	0.79 (0.40, 1.58)
[recruited wave 3 v. wave 1 (ref)]	β_3	0.84 (0.52, 1.35)	0.83 (0.52, 1.34)
[recruited wave 2 v. wave 1 (ref)]	β_4	1.49 (0.95, 2.35)	1.47 (0.95, 2.29)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	1.05 (0.69, 1.58)	1.04 (0.69, 1.58)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	1.01 (0.71, 1.44)	1.01 (0.71, 1.42)
Demographic variables			

Age group [55+ v. 18-24 (ref)]]	β_7	2.83 (0.86, 9.32)	2.91 (0.93, 9.14)
[40-54 v. 18-24 (ref)]]	β_8	1.72 (0.45, 6.50)	1.79 (0.50, 6.39)
[25-39 v. 18-24 (ref)]]	β_9	1.45 (0.33, 6.46)	1.50 (0.36, 6.30)
Urban/rural status [ref=rural]	β_{10}	1.12 (0.70, 1.79)	1.12 (0.70, 1.80)
Education [high v. low (ref)]]	β_{11}	1.59 (0.61, 4.10)	1.59 (0.62, 4.08)
[moderate v. low (ref)]]	β_{12}	1.20 (0.58, 2.49)	1.20 (0.59, 2.46)
Income [high v. low (ref)]]	β_{13}	0.96 (0.60, 1.54)	0.97 (0.61, 1.55)
[moderate v. low (ref)]]	β_{14}	0.99 (0.70, 1.40)	0.99 (0.70, 1.40)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{15}	2.33 (1.57, 3.45)***	2.33 (1.58, 3.44)***
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{16}	0.81 (0.52, 1.27)	0.81 (0.52, 1.26)
[15+ v. ≤5 cigs/day (ref)]	β_{17}	0.71 (0.54, 0.94)	0.71 (0.54, 0.94)
Type of cigarette [FM+RYO v. FM (ref)]]	β_{18}	0.72 (0.45, 1.14)	0.71 (0.45, 1.12)
[RYO v. FM (ref)]]	β_{19}	0.78 (0.62, 0.98)**	0.75 (0.59, 0.96)*
Noticed anti-smoking campaign	β_{20}	1.55 (0.78, 3.09)	1.57 (0.80, 3.09)
Self-efficacy [high v. low (ref)]	β_{21}	1.75 (1.30, 2.37)***	1.78 (1.33, 2.38)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy
*p<0.05; **p<0.01; ***p<0.001

Table 4.8.f. Independent effects of covariates on quit because of label among adult male smokers in Thailand[c]

		Model 1[a]	Model 2[b]
Constant	β_0	4.68 (2.16, 10.16)	1.26 (0.87, 1.82)
Label salience	β_1	1.65 (1.17, 2.33)**	1.33 (1.01, 1.77)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_2	0.59 (0.26, 1.34)	0.61 (0.27, 1.38)
[recruited wave 3 v. wave 1 (ref)]	β_3	1.50 (1.02, 2.22)*	1.51 (1.01, 2.26)
[recruited wave 2 v. wave 1 (ref)]	β_4	0.82 (0.60, 1.11)	0.81 (0.60, 1.11)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_5	0.72 (0.56, 0.94)*	0.75 (0.57, 0.98)
[wave-pair 3 v. wave-pair 2 (ref)]	β_6	0.85 (0.58, 1.26)	0.89 (0.61, 1.29)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_7	0.84 (0.43, 1.64)	0.84 (0.44, 1.60)
[40-54 v. 18-24 (ref)]]	β_8	1.79 (1.04, 3.06)**	1.78 (1.06, 2.99)**
[25-39 v. 18-24 (ref)]]	β_9	1.43 (0.86, 2.37)	1.43 (0.88, 2.34)
Urban/rural status [ref=rural]	β_{10}	1.17 (0.77, 1.78)	1.18 (0.78, 1.79)
Education [high v. low (ref)]]	β_{11}	0.97 (0.43, 2.17)	0.98 (0.44, 2.18)
[moderate v. low (ref)]]	β_{12}	0.86 (0.46, 1.63)	0.88 (0.47, 1.65)
Income [high v. low (ref)]]	β_{13}	0.84 (0.51, 1.39)	0.85 (0.52, 1.40)
[moderate v. low (ref)]]	β_{14}	0.90 (0.62, 1.29)	0.89 (0.62, 1.28)

Smoking-related variables			
Smoking frequency [Daily v. non-daily (ref)]]	β_{15}	3.74 (1.81, 7.76)***	3.81 (1.83, 7.92)
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{16}	0.48 (0.32, 0.70)**	0.48 (0.32, 0.70)***
[15+ v. ≤5 cigs/day (ref)]	β_{17}	0.57 (0.42, 0.77)**	0.56 (0.42, 0.76)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{18}	1.23 (0.85, 1.78)	1.26 (0.87, 1.82)
[RYO v. FM (ref)]]	β_{19}	1.75 (1.36, 2.26)***	1.80 (1.41, 2.31)***
Noticed anti-smoking campaign	β_{20}	1.41 (0.72, 2.76)	1.40 (0.72, 2.71)
Self-efficacy [high v. low (ref)]	β_{21}	1.46 (1.08, 1.97)*	1.42 (1.06, 1.90)*

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy
*p<0.05; **p<0.01; ***p<0.001

Table 4.9.a. Independent effects of covariates on high smoking intensity among adult male smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.36 (0.17, 0.78)	0.34 (0.16, 0.75)
Label salience	β_1	0.93 (0.68, 1.27)	0.99 (0.83, 1.17)
Country [Thailand v. Malaysia (ref)]	β_2	0.95 (0.72, 1.25)	0.95 (0.72, 1.25)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	1.12 (0.72, 1.76)	1.12 (0.72, 1.76)
[recruited wave 3 v. wave 1 (ref)]	β_4	1.22 (0.96, 1.56)	1.22 (0.96, 1.56)
[recruited wave 2 v. wave 1 (ref)]	β_5	1.33 (0.93, 1.90)	1.33 (0.93, 1.90)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	0.96 (0.82, 1.13)	0.96 (0.81, 1.14)
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.06 (0.90, 1.24)	1.05 (0.89, 1.24)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_8	1.06 (0.70, 1.63)	1.06 (0.70, 1.63)
[40-54 v. 18-24 (ref)]]	β_9	1.80 (1.21, 2.69)***	1.80 (1.20, 2.70)***
[25-39 v. 18-24 (ref)]]	β_{10}	1.59 (1.07, 2.35)***	1.58 (1.07, 2.35)***
Urban/rural status [ref=rural]	β_{11}	1.06 (0.77, 1.45)	1.06 (0.77, 1.45)
Education [high v. low (ref)]]	$\hat{\beta}_{12}$	1.06 (0.61, 1.86)	1.06 (0.61, 1.84)
[moderate v. low (ref)]]	β_{13}	1.03 (0.66, 1.62)	1.03 (0.66, 1.61)
Income [high v. low (ref)]]	β_{14}	1.34 (1.08, 1.66)*	1.34 (1.08, 1.66)*
[moderate v. low (ref)]]	β_{15}	1.17 (1.00, 1.37)	1.17 (1.00, 1.37)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	0.35 (0.20, 0.62)***	0.35 (0.20, 0.61)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{17}	0.91 (0.71, 1.18)	0.91 (0.71, 1.17)
[RYO v. FM (ref)]]	β_{18}	0.77 (0.55, 1.06)	0.77 (0.55, 1.08)
Noticed anti-smoking campaign	β_{19}	0.90 (0.64, 1.25)	0.89 (0.64, 1.25)
Self-efficacy [high v. low (ref)]	β_{20}	0.70 (0.60, 0.81)***	0.70 (0.60, 0.81)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted

for wave-pair, cohort, sex, age group, urban/rural status, education, income, smoking frequency, daily smoking intensity, type of cigarette smoked, noticed anti-smoking campaign, and selfefficacy
*p<0.05; **p<0.01; ***p<0.001

Table 4.9.b. Independent effects of covariates on reduce smoking intensity among adult male smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	8.55 (5.67, 15.64)	16.59 (6.16, 29.40)
Label salience	β_1	1.40 (0.64, 3.10)	1.15 (0.74, 1.77)
Country [Thailand v. Malaysia (ref)]	β_2	0.33 (0.14, 0.80)*	0.33 (0.13, 0.80)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	1.63 (0.60, 4.43)	1.60 (0.59, 4.34)
[recruited wave 3 v. wave 1 (ref)]	β_4	1.13 (0.56, 2.28)	1.12 (0.55, 2.27)
[recruited wave 2 v. wave 1 (ref)]	β_5	2.05 (1.12, 3.77)	2.04 (1.11, 3.76)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	1.34 (0.57, 3.12)	1.36 (0.58, 3.17)
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.42 (0.68, 2.95)	1.44 (0.68, 3.05)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_8	7.91 (2.56, 24.40)**	7.78 (2.50, 24.25)***
[40-54 v. 18-24 (ref)]]	β_9	3.02 (1.18, 7.71)**	2.96 (1.18, 7.45)***
[25-39 v. 18-24 (ref)]]	β_{10}	1.83 (0.97, 3.47)	1.81 (0.94, 3.45)
Urban/rural status [ref=rural]	β_{11}	1.38 (0.87, 2.18)	1.40 (0.88, 2.21)
Education [high v. low (ref)]]	β_{12}	0.08 (0.01, 0.96)	0.08 (0.01. 0.96)
[moderate v. low (ref)]]	β_{13}	0.09 (0.01, 0.78)	0.09 (0.01, 0.79)
Income [high v. low (ref)]]	β_{14}	1.02 (0.57, 1.81)	1.03 (0.57, 1.84)
[moderate v. low (ref)]]	β_{15}	0.99 (0.52, 1.88)	0.99 (0.52, 1.89)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	5.62 (1.96, 16.08)***	5.63 (2.02, 15.72)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{17}	0.97 (0.55, 1.70)	0.97 (0.56, 1.70)
[RYO v. FM (ref)]]	β_{18}	3.29 (1.69, 6.37)**	3.34 (1.71, 6.55)***
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{19}	0.65 (0.27, 1.56)	0.65 (0.27, 1.56)
[15+ v. ≤5 cigs/day (ref)]	β_{20}	1.70 (0.69, 4.19)	1.69 (0.69, 4.19)
Noticed anti-smoking campaign	β_{21}	1.17 (0.42, 3.27)	1.16 (0.41, 3.29)
Self-efficacy [high v. low (ref)]	β_{22}	1.72 (0.97, 3.04)	1.69 (0.93, 3.07)

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.9.c. Independent effects of covariates on plan to quit among adult male smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.34 (0.14, 0.78)	0.35 (0.16, 0.78)
Label salience	β_1	1.12 (0.77, 1.63)	1.17 (0.92, 1.48)
Country [Thailand v. Malaysia (ref)]	β_2	0.47 (0.33, 0.66)***	0.46 (0.32, 0.65)***
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	2.00 (1.37, 2.93)***	2.02 (1.38, 2.96)***
[recruited wave 3 v. wave 1 (ref)]	β_4	1.22 (0.94, 1.60)	1.24 (0.94, 1.62)
[recruited wave 2 v. wave 1 (ref)]	β_5	1.22 (1.00, 1.48)	1.23 (1.01, 1.49)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	0.81 (0.63, 1.04)	0.81 (0.63, 1.05)
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.14 (0.81, 1.60)	1.15 (0.81, 1.63)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_8	1.24 (0.87, 1.76)	1.24 (0.87, 1.76)
[40-54 v. 18-24 (ref)]]	β_9	1.13 (0.81, 1.56)	1.12 (0.80, 1.56)
[25-39 v. 18-24 (ref)]]	β_{10}	0.83 (0.66, 1.04)	0.82 (0.65, 1.04)
Urban/rural status [ref=rural]	β_{11}	1.29 (0.99, 1.68)	1.30 (1.00, 1.69)
Education [high v. low (ref)]]	β_{12}	0.94 (0.57, 1.56)	0.93 (0.56, 1.55)
[moderate v. low (ref)]]	β_{13}	0.81 (0.52, 1.56)	0.80 (0.52, 1.24)
Income [high v. low (ref)]]	β_{14}	0.75 (0.55, 1.01)	0.75 (0.56, 1.02)
[moderate v. low (ref)]]	β_{15}	0.81 (0.66,1.00)	0.81 (0.66, 1.00)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	2.06 (1.35, 3.13)***	2.09 (1.36, 3.19)**
Type of cigarette [FM+RYO v. FM (ref)]]	β_{17}	1.15 (0.88, 1.51)	1.15 (0.88, 1.52)
[RYO v. FM (ref)]]	β_{18}	1.04 (0.78, 1.39)	1.06 (0.79, 1.43)
Smoking Intensity [6-14 v. $\leq$5 cigs/day (ref)]	β_{19}	0.64 (0.48, 0.87)**	0.64 (0.47, 0.87)**
[15+ v. $\leq$5 cigs/day (ref)]	β_{20}	0.83 (0.66, 1.04)	0.83 (0.66, 1.04)
Noticed anti-smoking campaign	$\hat{\beta}_{21}$	1.41 (0.89, 2.22)	1.38 (0.87, 2.21)
Self-efficacy [high v. low (ref)]	β_{22}	1.53 (1.27, 1.85)***	1.51 (1.24, 1.84)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.9.d. Independent effects of covariates on quit attempts among adult male smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	2.66 (1.31, 5.39)	2.62 (1.30, 5.30)
Label salience	β_1	1.08 (0.84, 1.40)	1.25 (1.01, 1.55)*
Country [Thailand v. Malaysia (ref)]	β_2	1.41 (1.02, 1.95)*	1.37 (0.99, 1.90)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	1.87 (1.37, 2.56)***	1.90 (1.38, 2.60)***
[recruited wave 3 v. wave 1 (ref)]	β_4	1.06 (0.79, 1.42)	1.08 (0.80, 1.45)
[recruited wave 2 v. wave 1 (ref)]	β_5	1.06 (0.90, 1.25)	1.06 (0.90, 1.26)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	0.56 (0.46, 0.69)***	0.57 (0.46, 0.69)***
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	0.62 (0.46, 0.82)***	0.62 (0.47, 0.83)***
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_8	0.81 (0.60, 1.11)	0.81 (0.59, 1.10)
[40-54 v. 18-24 (ref)]]	β_9	0.95 (0.73, 1.22)	0.93 (0.72, 1.20)
[25-39 v. 18-24 (ref)]]	β_{10}	0.75 (0.58, 0.97)*	0.74 (0.57, 0.97)*
Urban/rural status [ref=rural]	β_{11}	1.42 (1.07, 1.87)*	1.42 (1.07, 1.88)*
Education [high v. low (ref)]]	β_{12}	0.93 (0.56, 1.55)	0.91 (0.56, 1.49)
[moderate v. low (ref)]]	β_{13}	0.82 (0.53, 1.26)	0.80 (0.53, 1.23)
Income [high v. low (ref)]]	β_{14}	0.99 (0.77, 1.27)	1.00 (0.71, 1.41)
[moderate v. low (ref)]]	β_{15}	0.81 (0.67, 0.98)*	0.82 (0.68, 0.98)*
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	2.93 (2.02, 4.26)***	2.98 (2.05, 4.33)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{17}	1.16 (0.93, 1.45)	1.17 (0.93, 1.47)
[RYO v. FM (ref)]]	β_{18}	0.99 (0.77, 1.27)	1.03 (0.81, 1.31)
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{19}	0.46 (0.37, 0.57)***	0.46 (0.37, 0.57)***
[15+ v. ≤5 cigs/day (ref)]	β_{20}	0.60 (0.47, 0.77)***	0.61 (0.48, 0.77)***
Noticed anti-smoking campaign	β_{21}	1.40 (0.93, 2.10)	1.37 (0.91, 2.07)
Self-efficacy [high v. low (ref)]	β_{22}	1.16 (0.94, 1.43)	1.13 (0.92, 1.40)

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.9.e. Independent effects of covariates on cessation among adult male smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.08 (0.03, 0.21)	0.10 (0.04, 0.25)
Label salience	β_1	1.10 (0.68, 1.79)	0.84 (0.65, 1.08)
Country [Thailand v. Malaysia (ref)]	β_2	0.62 (0.42, 0.92)*	0.63 (0.42, 0.94)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	0.86 (0.56, 1.33)	0.86 (0.56, 1.31)
[recruited wave 3 v. wave 1 (ref)]	β_4	0.79 (0.52, 1.19)	0.78 (0.52, 1.18)
[recruited wave 2 v. wave 1 (ref)]	β_5	1.36 (0.90, 2.06)	1.34 (0.89, 2.02)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	1.06 (0.72, 1.56)	1.05 (0.71, 1.56)
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	1.03 (0.74, 1.44)	1.02 (0.73, 1.42)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_8	2.17 (1.19, 3.97)***	2.21 (1.23, 3.98)***
[40-54 v. 18-24 (ref)]]	β_9	1.33 (0.67, 2.63)	1.37 (0.72, 2.64)
[25-39 v. 18-24 (ref)]]	β_{10}	1.10 (0.56, 2.18)	1.13 (0.58, 2.17)
Urban/rural status [ref=rural]	β_{11}	1.05 (0.74, 1.49)	1.05 (0.74, 1.50)
Education [high v. low (ref)]]	β_{12}	1.68 (0.81, 3.48)	1.71 (0.82, 3.56)
[moderate v. low (ref)]]	β_{13}	1.14 (0.61, 2.14)	1.16 (0.62, 2.16)
Income [high v. low (ref)]]	β_{14}	0.83 (0.55, 1.27)	0.84 (0.55, 1.27)
[moderate v. low (ref)]]	β_{15}	1.04 (0.77, 1.39)	1.03 (0.77, 1.39)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	2.22 (1.52, 3.24)***	2.23 (1.53, 3.24)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{17}	0.79 (0.52, 1.22)	0.79 (0.51, 1.21)
[RYO v. FM (ref)]]	β_{18}	0.85 (0.66, 1.08)	0.81 (0.63, 1.05)
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{19}	0.83 (0.57, 1.21)	0.82 (0.56, 1.20)
[15+ v. ≤5 cigs/day (ref)]	β_{20}	0.74 (0.54, 1.01)	0.73 (0.53, 1.01)
Noticed anti-smoking campaign	β_{21}	1.28 (0.74, 2.21)	1.30 (0.76, 2.23)
Self-efficacy [high v. low (ref)]	β_{22}	1.60 (1.26, 2.04)***	1.63 (1.29, 2.06)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.9.f. Independent effects of covariates on quit because of label among adult male smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	1.79 (0.81, 3.97)	2.23 (1.01, 4.91)
Label salience	β_1	1.35 (0.94, 1.94)	1.07 (0.84, 1.37)
Country [Thailand v. Malaysia (ref)]	β_2	3.35 (2.32, 4.81)***	3.29 (2.29, 4.72)***
Cohort [recruited wave 4 v. wave 1 (ref)]	β_3	0.99 (0.67, 1.46)	0.98 (0.67, 1.45)
[recruited wave 3 v. wave 1 (ref)]	β_4	1.30 (0.96, 1.75)	1.30 (0.96, 1.76)
[recruited wave 2 v. wave 1 (ref)]	β_5	0.83 (0.66, 1.06)	0.83 (0.66, 1.06)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_6	0.69 (0.52, 0.92)*	0.70 (0.53, 0.94)*
[wave-pair 3 v. wave-pair 2 (ref)]	β_7	0.89 (0.61, 1.32)	0.91 (0.62, 1.33)
Demographic variables			
Age group [55+ v. 18-24 (ref)]]	β_8	0.72 (0.43, 1.22)	0.73 (0.43, 1.22)
[40-54 v. 18-24 (ref)]]	β_9	1.42 (0.98, 2.05)	1.43 (0.99, 2.06)
[25-39 v. 18-24 (ref)]]	β_{10}	1.12 (0.85, 1.47)	1.13 (0.86, 1.48)
Urban/rural status [ref=rural]	β_{11}	1.14 (0.88, 1.47)	1.14 (0.89, 1.47)
Education [high v. low (ref)]]	β_{12}	0.72 (0.36, 1.42)	0.72 (0.37, 1.42)
[moderate v. low (ref)]]	β_{13}	1.03 (0.57, 1.87)	1.04 (0.58, 1.87)
Income [high v. low (ref)]]	β_{14}	0.96 (0.67, 1.37)	0.96 (0.67, 1.38)
[moderate v. low (ref)]]	β_{15}	1.06 (0.76, 1.50)	1.06 (0.75, 1.49)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{16}	3.41 (2.12, 5.47)***	3.44 (2.15, 5.51)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{17}	1.18 (0.85, 1.63)	1.19 (0.86, 1.64)
[RYO v. FM (ref)]]	β_{18}	1.57 (1.19, 2.05)**	1.55 (1.18, 2.05)**
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{19}	0.47 (0.34, 0.65)***	0.47 (0.34, 0.64)***
[15+ v. ≤5 cigs/day (ref)]	β_{20}	0.61 (0.44, 0.86)***	0.61 (0.44, 0.85)***
Noticed anti-smoking campaign	β_{21}	1.35 (0.78, 2.34)	1.36 (0.79, 2.33)
Self-efficacy [high v. low (ref)]	β_{22}	1.27 (1.06, 1.52)*	1.26 (1.05, 1.51)*

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.10.a. Independent effects of covariates on high intensity smoking with the inclusion of an interaction term (salience*loosies) among adult smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	1.00 (0.36, 2.78)	1.09 (0.39, 3.01)
Label salience	β_1	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Loosies	β_2	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (1) * **loosies** (1)	β_3	0.37 (0.23, 0.60)***	0.37 (0.20, 0.66)***
Label salience (1) * **loosies** (0) [ref]	β_4	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (0) * **loosies** (1)	β_5	0.86 (0.43, 1.69)	0.84 (0.68, 1.05)
Label salience (0) * **loosies** (0)	β_6	1.09 (0.73, 1.64)	0.75 (0.52, 1.09)
Country [Thailand v. Malaysia (ref)]	β_7	1.15 (0.86, 1.54)	1.14 (0.85, 1.53)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_8	1.04 (0.66, 1.66)	1.05 (0.66, 1.66)
[recruited wave 3 v. wave 1 (ref)]	β_9	1.15 (0.84, 1.56)	1.15 (0.85, 1.57)
[recruited wave 2 v. wave 1 (ref)]	β_{10}	1.19 (0.81, 1.76)	1.21 (0.82, 1.78)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_{11} $\hat{\beta}_{12}$	0.99 (0.77, 1.27)	0.98 (0.76, 1.26)
[wave-pair 3 v. wave-pair 2 (ref)]		1.16 (0.92, 1.47)	1.15 (0.91, 1.45)
Demographic variables			
Sex [ref=male]	β_{13}	0.32 (0.15, 0.68)**	0.32 (0.15, 0.68)**
Age group [55+ v. 18-24 (ref)]]	β_{14}	1.03 (0.68, 1.55)	1.02 (0.68, 1.53)
[40-54 v. 18-24 (ref)]]	β_{15}	1.66 (1.10, 2.51)*	1.63 (1.08, 2.47)*
[25-39 v. 18-24 (ref)]]	β_{16}	1.41 (0.95, 2.10)	1.40 (0.94, 2.08)
Urban/rural status [ref=rural]	β_{17}	1.00 (0.75, 1.34)	1.00 (0.75, 1.34)
Education [high v. low (ref)]]	β_{18}	1.03 (0.57, 1.87)	1.02 (0.57, 1.82)
[moderate v. low (ref)]]	β_{19}	0.99 (0.59, 1.64)	0.98 (0.59, 1.62)
Income [high v. low (ref)]]	β_{20}	1.23 (1.00, 1.52)	1.23 (0.99, 1.52)
[moderate v. low (ref)]]	β_{21}	1.22 (1.02, 1.46)*	1.21 (1.01, 1.46)*
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{22}	0.36 (0.20, 0.64)***	0.36 (0.21, 0.64)***
Type of cigarette [FM+RYO v. FM (ref)]]	$\hat{\beta}_{23}$ $\hat{\beta}_{24}$	1.01 (0.76, 1.33)	1.01 (0.77, 1.34)
[RYO v. FM (ref)]]		0.67 (0.47, 0.95)*	0.68 (0.47, 0.98)*
Noticed anti-smoking campaign	β_{25}	1.02 (0.63, 1.64)	1.01 (0.62, 1.62)
Self-efficacy [high v. low (ref)]	β_{26}	0.66 (0.53, 0.81)***	0.65 (0.53, 0.81)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking

frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.10.b. Independent effects of covariates on reduce smoking intensity smoking with the inclusion of an interaction term (salience*loosies) among adult smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	2.41 (1.15, 38.24)	4.49 (1.64, 66.32)
Label salience	β_1	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Loosies	β_2	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (1) * **loosies** (1)	β_3	1.33 (0.92, 1.91)	1.31 (0.87, 1.98)
Label salience (1) * **loosies** (0) [ref]	β_4	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (0) * **loosies** (1)	β_5	0.82 (0.64, 2.02)	1.00 (0.68, 1.48)
Label salience (0) * **loosies** (0)	β_6	0.90 (0.53, 1.51)	0.82 (0.64, 1.05)
Country [Thailand v. Malaysia (ref)]	β_7	0.30 (0.11, 0.83)*	0.29 (0.11, 0.81)*
Cohort [recruited wave 4 v. wave 1 (ref)]	β_8	1.65 (0.60, 4.58)	1.61 (0.58, 4.49)
[recruited wave 3 v. wave 1 (ref)]	β_9	1.35 (0.63, 2.86)	1.31 (0.61, 2.77)
[recruited wave 2 v. wave 1 (ref)]	β_{10}	1.74 (0.89, 3.41)	1.69 (0.86, 3.32)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_{11}	1.27 (0.33, 4.83)	1.29 (0.35, 4.73)
[wave-pair 3 v. wave-pair 2 (ref)]	$\hat{\beta}_{12}$	1.17 (0.46, 2.99)	1.21 (0.46, 3.13)
Demographic variables			
Sex [ref=male]	β_{13}	3.47 (0.97, 12.48)	3.26 (0.90, 11.87)
Age group [55+ v. 18-24 (ref)]]	β_{14}	6.27 (2.26, 17.40)*	5.95 (2.13, 16.65)*
[40-54 v. 18-24 (ref)]]	β_{15}	2.99 (1.35, 6.67)*	2.87 (1.27, 6.48)*
[25-39 v. 18-24 (ref)]]	β_{16}	1.72 (0.87, 3.41)	1.67 (0.80, 3.46)
Urban/rural status [ref=rural]	β_{17}	1.35 (0.87, 2.08)	1.35 (0.87, 2.09)
Education [high v. low (ref)]]	β_{18}	0.13 (0.02, 1.05)	0.13 (0.02, 0.95)
[moderate v. low (ref)]]	β_{19}	0.14 (0.02, 0.82)*	0.14 (0.03, 0.77)*
Income [high v. low (ref)]]	β_{20}	1.13 (0.66, 1.91)	1.15 (0.6, 2.01)
[moderate v. low (ref)]]	β_{21}	1.18 (0.72, 1.96)	1.21 (0.72, 2.02)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{22}	3.10 (1.37, 6.99)*	3.20 (1.53, 6.70)*
Type of cigarette [FM+RYO v. FM (ref)]]	$\hat{\beta}_{23}$	1.04 (0.36, 3.02)	1.04 (0.37, 2.94)
[RYO v. FM (ref)]]	$\hat{\beta}_{24}$	3.22 (1.18, 8.83)*	3.29 (1.22, 8.89)*
Noticed anti-smoking campaign	β_{25}	0.74 (0.20, 2.69)	0.69 (0.20, 2.34)
Self-efficacy [high v. low (ref)]	β_{26}	1.65 (1.01, 2.68)*	1.57 (0.93, 2.66)*

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.10.c. Independent effects of covariates on plan to quit smoking with the inclusion of an interaction term (salience*loosies) among adult smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.32 (0.10, 1.08)	0.38 (0.10, 1.50)
Label salience	β_1	1.00 (1.00, 1.00)	1.06 (0.78, 1.45)
Loosies	β_2	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (1) * **loosies** (1)	β_3	1.08 (0.83, 1.42)	1.17 (0.79, 1.73)
Label salience (1) * **loosies** (0) [ref]	β_4	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (0) * **loosies** (1)	β_5	0.68 (0.40, 1.14)	0.96 (0.70, 1.32)
Label salience (0) * **loosies** (0)	β_6	0.94 (0.63, 1.41)	0.93 (0.72, 1.20)
Country [Thailand v. Malaysia (ref)]	β_7	0.40 (0.28, 0.57)***	0.39 (0.27, 0.55)***
Cohort [recruited wave 4 v. wave 1 (ref)]	β_8	2.02 (1.37, 2.98)	2.08 (1.41, 3.06)
[recruited wave 3 v. wave 1 (ref)]	β_9	1.28 (0.95, 1.73)	1.31 (0.96, 1.78)
[recruited wave 2 v. wave 1 (ref)]	β_{10}	1.31 (1.03, 1.66)	1.35 (1.08, 1.69)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_{11} $\hat{\beta}_{12}$	0.67 (0.44, 1.01)	0.71 (0.46, 1.09)
[wave-pair 3 v. wave-pair 2 (ref)]		1.05 (0.63, 1.77)	1.13 (0.68, 1.91)
Demographic variables			
Sex [ref=male]	β_{13}	0.96 (0.44, 2.09)	0.90 (0.42, 1.94)
Age group [55+ v. 18-24 (ref)]]	β_{14}	1.40 (0.91, 2.14)	1.37 (0.89, 2.11)
[40-54 v. 18-24 (ref)]]	β_{15}	1.10 (0.77, 1.57)	1.08 (0.74, 1.56)
[25-39 v. 18-24 (ref)]]	β_{16}	0.85 (0.69, 1.06)	0.84 (0.67, 1.05)
Urban/rural status [ref=rural]	β_{17}	1.27 (0.96, 1.67)	1.28 (0.97, 1.69)
Education [high v. low (ref)]]	β_{18}	0.87 (0.43, 1.77)	0.85 (0.41, 1.72)
[moderate v. low (ref)]]	β_{19}	0.76 (0.38, 1.51)	0.74 (0.37, 1.47)
Income [high v. low (ref)]]	β_{20}	0.72 (0.52, 1.00)	0.73 (0.52, 1.00)
[moderate v. low (ref)]]	β_{21}	0.81 (0.63, 1.03)	0.82 (0.64, 1.04)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{22}	1.59 (1.02, 2.48)*	1.94 (1.14, 3.29)*
Type of cigarette [FM+RYO v. FM (ref)]]	β_{23}	1.30 (0.91, 1.85)	1.29 (0.90, 1.86)
[RYO v. FM (ref)]]	β_{24}	1.28 (0.91, 1.81)	1.26 (0.88, 1.81)
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{25}	0.68 (0.50, 0.93)*	0.66 (0.48, 0.92)*
[15+ v. ≤5 cigs/day (ref)]	β_{26}	0.81 (0.63, 1.03)	0.80 (0.62, 1.03)
Noticed anti-smoking campaign	β_{27}	1.06 (0.70, 1.60)	1.01 (0.67, 1.53)
Self-efficacy [high v. low (ref)]	β_{28}	1.55 (1.20, 2.02)**	1.46 (1.13, 1.89)**

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.10.d. Independent effects of covariates on quit attempt with the inclusion of an interaction term (salience*loosies) among adult smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.95 (0.36, 2.51)	1.01 (0.39, 2.61)
Label salience	β_1	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Loosies	β_2	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (1) * **loosies** (1)	β_3	1.08 (0.83, 1.42)	1.07 (0.79, 1.44)
Label salience (1) * **loosies** (0) [ref]	β_4	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (0) * **loosies** (1)	β_5	0.98 (0.38, 2.52)	1.27 (0.79, 2.03)
Label salience (0) * **loosies** (0)	β_6	0.76 (0.48, 1.22)	1.01 (0.77, 1.31)
Country [Thailand v. Malaysia (ref)]	β_7	1.25 (0.93, 1.68)	1.23 (0.91, 1.67)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_8	1.99 (1.47, 2.68)***	2.00 (1.48, 2.70)***
[recruited wave 3 v. wave 1 (ref)]	β_9	1.13 (0.87, 1.47)	1.13 (0.87, 1.47)
[recruited wave 2 v. wave 1 (ref)]	β_{10}	1.20 (0.99, 1.47)	1.20 (0.99, 1.46)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_{11} $\hat{\beta}_{12}$	0.46 (0.35, 0.60)***	0.46 (0.35, 0.61)***
[wave-pair 3 v. wave-pair 2 (ref)]		0.62 (0.44, 0.88)***	0.63 (0.45, 0.88)***
Demographic variables			
Sex [ref=male]	β_{13}	1.50 (0.86, 2.59)	1.50 (0.86, 2.60)
Age group [55+ v. 18-24 (ref)]]	β_{14}	0.82 (0.58, 1.16)	0.81 (0.57, 1.16)
[40-54 v. 18-24 (ref)]]	β_{15}	1.00 (0.75, 1.31)	0.99 (0.75, 1.30)
[25-39 v. 18-24 (ref)]]	β_{16}	0.74 (0.56, 0.96)*	0.73 (0.56, 0.96)*
Urban/rural status [ref=rural]	β_{17}	1.60 (1.20, 2.14)**	1.60 (1.20, 2.14)**
Education [high v. low (ref)]]	β_{18}	0.89 (0.50, 1.61)	0.88 (0.49, 1.57)
[moderate v. low (ref)]]	β_{19}	0.78 (0.46, 1.31)	0.77 (0.46, 1.29)
Income [high v. low (ref)]]	β_{20}	1.02 (0.66, 1.57)	1.03 (0.67, 1.58)
[moderate v. low (ref)]]	β_{21}	0.85 (0.62, 1.18)	0.86 (0.62, 1.18)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{22}	2.70 (1.80, 4.05)***	2.75 (1.82, 4.14)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{23}	1.33 (0.99, 1.80)	1.34 (0.99, 1.81)
[RYO v. FM (ref)]]	β_{24}	1.30 (0.93, 1.81)	1.32 (0.95, 1.85)
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{25}	0.46 (0.37, 0.58)***	0.46 (0.37, 0.58)***
[15+ v. ≤5 cigs/day (ref)]	β_{26}	0.56 (0.41, 0.78)***	0.56 (0.40, 0.78)***
Noticed anti-smoking campaign	β_{27}	1.81 (1.09, 3.01)*	1.79 (1.07, 2.99)*
Self-efficacy [high v. low (ref)]	β_{28}	1.18 (0.95, 1.48)	1.17 (0.93, 1.47)

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

		Model 1[a]	Model 2[b]
Constant	β_0	0.03 (0.01, 0.15)	0.02 (0.00, 0.12)
Label salience		1.00 (1.00, 1.00)	1.00 (1.00, 1.00)

Loosies		1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (1) * **loosies** (1)	β_1	1.04 (0.74, 1.46)	1.24 (0.88, 1.76)
Label salience (1) * **loosies** (0) [ref]	β_2	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (0) * **loosies** (1)	β_3	0.44 (0.12, 1.66)	0.89 (0.45, 1.75)
Label salience (0) * **loosies** (0)	β_4	0.53 (0.22, 1.23)	1.27 (0.85, 1.90)
Country [Thailand v. Malaysia (ref)]	β_5	0.71 (0.45, 1.13)	0.72 (0.46, 1.14)
Cohort [recruited wave 4 v. wave 1 (ref)]	β_6	0.84 (0.54, 1.32)	0.84 (0.54, 1.31)
[recruited wave 3 v. wave 1 (ref)]	β_7	0.76 (0.46, 1.24)	0.75 (0.46, 1.24)
[recruited wave 2 v. wave 1 (ref)]	β_8	1.13 (0.73, 1.74)	1.13 (0.72, 1.76)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_9	1.34 (0.78, 2.30)	1.35 (0.80, 2.27)
[wave-pair 3 v. wave-pair 2 (ref)]	β_{10}	1.23 (0.70, 2.13)	1.22 (0.70, 2.11)
Demographic variables			
Sex [ref=male]	β_{11}	1.42 (0.75, 2.69)	1.31 (0.63, 2.68)
Age group [55+ v. 18-24 (ref)]]	β_{12}	1.80 (0.98, 3.32)	1.88 (1.04, 3.38)
[40-54 v. 18-24 (ref)]]	β_{13}	1.53 (0.76, 3.09)	1.63 (0.83, 3.19)
[25-39 v. 18-24 (ref)]]	β_{14}	1.04 (0.52, 2.11)	1.09 (0.55, 2.14)
Urban/rural status [ref=rural]	β_{15}	1.08 (0.80, 1.46)	1.09 (0.81, 1.46)
Education [high v. low (ref)]]	β_{16}	2.29 (1.14, 4.59)*	2.40 (1.20, 4.81)*
[moderate v. low (ref)]]	β_{17}	1.45 (0.79, 2.66)	1.51 (0.82, 2.77)
Income [high v. low (ref)]]	β_{18}	0.85 (0.50, 1.44)	0.86 (0.51, 1.45)
[moderate v. low (ref)]]	β_{19}	1.02 (0.72, 1.44)	1.02 (0.73, 1.42)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{20}	2.32 (1.48, 3.65)***	2.34 (1.50, 3.63)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{21}	0.69 (0.39, 1.22)	0.69 (0.39, 1.21)
[RYO v. FM (ref)]]	β_{22}	0.75 (0.46, 1.23)	0.70 (0.42, 1.15)
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{23}	0.77 (0.47, 1.27)	0.76 (0.47, 1.24)
[15+ v. ≤5 cigs/day (ref)]	β_{24}	0.74 (0.49, 1.13)	0.73 (0.48, 1.11)
Noticed anti-smoking campaign	β_{25}	1.07 (0.54, 2.12)	1.12 (0.57, 2.18)
Self-efficacy [high v. low (ref)]	β_{26}	1.54 (1.17, 2.03)**	1.57 (1.21, 2.06)**

Table 4.10.e. Independent effects of covariates on cessation with the inclusion of an interaction term (salience*loosies) among adult smokers in Thailand and Malaysia[c]

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref]
[b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref]
[c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Table 4.10.f. Independent effects of covariates on quit because of labels with the inclusion of an interaction term (salience*loosies) among adult smokers in Thailand and Malaysia[c]

		Model 1[a]	Model 2[b]
Constant	β_0	0.60 (0.19, 1.82)	0.59 (0.19, 1.85)
Label salience	β_1	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)

Loosies	β_2	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (1) * **loosies** (1)	β_3	1.42 (1.02, 1.99)*	1.51 (1.02, 2.24)*
Label salience (1) * **loosies** (0) [ref]	β_4	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
Label salience (0) * **loosies** (1)	β_5	0.98 (0.38, 2.52)	1.27 (0.79, 2.03)
Label salience (0) * **loosies** (0)	β_6	0.76 (0.48, 1.22)	1.01 (0.77, 1.31)
Country [Thailand v. Malaysia (ref)]	β_7	3.44 (2.30, 5.15)***	3.40 (2.28, 5.06)***
Cohort [recruited wave 4 v. wave 1 (ref)]	β_8	1.03 (0.70, 1.52)	1.02 (0.69, 1.51)
[recruited wave 3 v. wave 1 (ref)]	β_9	1.25 (0.91, 1.71)	1.25 (0.91, 1.72)
[recruited wave 2 v. wave 1 (ref)]	β_{10}	0.88 (0.69, 1.14)	0.88 (0.69, 1.14)
Wave-pair [wave-pair 4 v. wave-pair 2 (ref)]	β_{11} $\hat{\beta}_{12}$	0.81 (0.55, 1.20)	0.82 (0.57, 1.19)
[wave-pair 3 v. wave-pair 2 (ref)]		0.87 (0.56, 1.37)	0.88 (0.57, 1.36)
Demographic variables			
Sex [ref=male]	β_{13}	0.70 (0.33, 1.47)	0.70 (0.33, 1.46)
Age group [55+ v. 18-24 (ref)]]	β_{14}	0.92 (0.54, 1.57)	0.92 (0.54, 1.58)
[40-54 v. 18-24 (ref)]]	β_{15}	1.37 (0.93, 2.01)	1.38 (0.94, 2.02)
[25-39 v. 18-24 (ref)]]	β_{16}	1.15 (0.87, 1.53)	1.16 (0.87, 1.54)
Urban/rural status [ref=rural]	β_{17}	1.14 (0.90, 1.45)	1.15 (0.90, 1.45)
Education [high v. low (ref)]]	β_{18}	0.96 (0.46, 2.00)	0.96 (0.46, 1.99)
[moderate v. low (ref)]]	β_{19}	1.37 (0.72, 2.60)	1.37 (0.72, 2.59)
Income [high v. low (ref)]]	β_{20}	0.92 (0.64, 1.31)	0.92 (0.64, 1.31)
[moderate v. low (ref)]]	β_{21}	1.01 (0.72, 1.43)	1.01 (0.72, 1.42)
Smoking-related variables			
Smoking frequency [Non-daily v. daily (ref)]]	β_{22}	2.95 (1.77, 4.91)***	2.98 (1.79, 4.95)***
Type of cigarette [FM+RYO v. FM (ref)]]	β_{23}	1.14 (0.74, 1.76)	1.15 (0.75, 1.76)
[RYO v. FM (ref)]]	β_{24}	1.16 (0.77, 1.75)	1.16 (0.77, 1.74)
Smoking Intensity [6-14 v. ≤5 cigs/day (ref)]	β_{25}	0.51 (0.35, 0.74)***	0.51 (0.35, 0.74)***
[15+ v. ≤5 cigs/day (ref)]	β_{26}	0.64 (0.43, 0.95)***	0.64 (0.43, 0.95)***
Noticed anti-smoking campaign	β_{27}	1.17 (0.67, 2.04)	1.17 (0.67, 2.02)
Self-efficacy [high v. low (ref)]	β_{28}	1.24 (1.02, 1.50)***	1.23 (1.01, 1.49)***

[a]Primary predictor variable is label salience dichotomized as salience v. no salience [ref] [b]Primary predictor variable is label salience dichotomized as high salience v. low salience [ref] [c]Models adjusted for wave-pair, cohort, age group, urban/rural status, education, income, smoking frequency, type of cigarette smoked, noticed anti-smoking campaign, and self-efficacy *p<0.05; **p<0.01; ***p<0.001

Chapter 5. Discussion

5.1. Overview of the dissertation

This longitudinal study of smoking outcomes in Malaysia and Thailand aimed to expand the limited knowledge of smoking intention, susceptibility, cognitive processing, and behaviors among youth and adults after the implementation of graphic cigarette warning labels.

First, to assess the effect of the graphic warning label policy on youth smoking outcomes, we used 'country of residence' as a proxy for the implementation of the policy. We limited our data to the timeframe capturing the pre-implementation period in Malaysia and post-implementation period in Thailand. As such, Thailand represented the experimental group and Malaysia served as a control in our quasi-experimental design. Our primary outcomes of interest were: smoking intention (plan initiate smoking among non- and never-smokers, and plan to continue smoking among smokers), smoking susceptibility (among non- and never-smokers), label saliency, and cognition of risk. Our secondary outcomes were behavioral, and were measured by 5 separate variables: smoking initiation, high-intensity smoking, quit attempt, increased smoking intensity, and reduced smoking intensity. Results for smoking behavior were preliminary, as the size of the sample of youth smokers was too small to achieve statistical significance. We fitted separate, gender-stratified, models of the effect of graphic cigarette labeling for each smoking outcome. A set of additional control variables account for cultural/attitudinal, social/normative, and intrapersonal factors. Such factors, derived from the Theory of Triadic Influence (TTI) [57, 58], have been shown to predict adolescent smoking behavior in previous research on youth smoking and other substance abuse [59-63].

The study then examined the effect of *frequency* of exposure to graphic cigarette warning labels on the same set of smoking outcomes (smoking intention, susceptibility, and behaviors) among youth in Thailand and Malaysia. Cognition of risk was used as a proxy for frequency of exposure, due to the collinearity between exposure and smoking behavior. Though the small size of our Malaysian sample precluded analysis solely among Malaysian youth, we combined data from Thailand and Malaysia and examined differences in outcomes across countries.

Finally, we examined the effect of frequency of exposure to graphic cigarette warning labels on smoking behaviors among adult smokers in Malaysia and Thailand. Specific outcomes included: high smoking intensity ($\geq$15 cigarettes per day), reduced smoking intensity at follow-up, plan to quit within 6 months, quit attempt between baseline and follow-up, cessation between baseline and follow-up, and

attribute quit status to warning labels (among quitters). To circumvent the perverse effect that arose from the conflation of the dependent (smoking behavior) and independent (exposure) variables, we utilized label saliency as a proxy for frequency of exposure. A secondary goal of our analysis was to examine the moderating effects of purchasing loose cigarettes on the association between label salience and smoking behaviors.

The three aims of the study fit within the conceptual framework of the effectiveness of graphic cigarette warning labels, diagramed in figure 1.1 examining how policy implementation and exposure to the labels affect smoking intentions, susceptibility, and behaviors. The framework outlines the overarching theoretical constructs through which exposure to the labels leads to smoking outcomes, but this study examines specific aspects of the framework, and identifies individual, social, cultural, and smoking-related psychosocial characteristics that affect smoking outcomes. In the following section, the main findings and interpretations are summarized.

5.2. Summary of the findings

5.2.1. Chapter 2

Table 5.1 contains a summary of findings from Chapter 2. Analyses of the effect of the graphic cigarette label policy implementation in Thailand, using Malaysia as a control, revealed significant effects on youth smoking intention, susceptibility, label salience, and cognition of risk.

Among male smokers, living in Thailand (which proxies the graphic cigarette labeling policy) significantly reduced the odds of planning to continue smoking by roughly 50%. Among non- and never-smokers females, living in Thailand reduced odds of planning to smoke by between 65% and 75% compared with living in Malaysia. Country of residence was also significantly associated with odds to plan to quit within 6 months among male smokers. Male youth smokers in Thailand were 2.7 to nearly 3 times more likely to quit smoking than youth smokers in Malaysia. Among female non- and never-smokers, residing in Thailand was associated with significantly lower odds of smoking susceptibility. Among male non-smokers and never-smokers, label salience was also significantly associated with country of residence. The odds of reporting high (vs. low) label salience among male non-smokers was elevated by approximately 50% in Thailand, relative to Malaysia. Similar, but stronger, results were found for male never-smokers, where label salience was elevated by approximately 90-104% among Thai youth, as

compared to their Malaysian counterparts. The results were similar for female non-smokers and neversmokers. Thai female non- and never-smokers had approximately double the odds of high label salience of similar Malaysian females. Among female non- and never-smokers, participants living in Thailand had significantly higher odds of high cognition of risk (vs. low) than in Malaysia. With regard to behavior, in none of the models did graphic cigarette labeling achieve statistical significance. Nevertheless, all coefficients were in the expected direction, and one outcome (quit attempt within the past year) had a strong trend toward statistical significance. Analysis of the independent effects of covariates revealed that peer smoking, smoking at home, and societal influence were significantly associated with smoking outcomes among youth.

Our youth findings align with those of some earlier research on the *adult* response in Southeast Asia, although differences in study frame, design, stratification, and models of smoking preclude direct comparison [22, 71, 105]. Findings from this research support the implementation of graphic cigarette warning labels in Southeast Asia, as they have positive effects on strong predictors of youth smoking behavior, namely, smoking intention, susceptibility, label saliency, and cognition of risk.

5.2.2. Chapter 3

Table 5.2 contains a summary of findings from Chapter 3. We sought to build upon our analyses in Chapter 2 by examining the association between frequency of exposure to graphic cigarette warning labels and smoking outcomes. The distinction between measuring the impact of the graphic labeling *policy* versus the impact of *frequency of exposure* to the label is subtle but extremely important. The analyses conducted in Chapter 3 allow us to further explore another mechanism through which labels are effective: perhaps the implementation of a tobacco control policy effectively increases the anti-smoking climate and culture in a society, or perhaps the labels work through direct exposure to, and communication of, visual communication of risk, or both. While we do not test the pathways directly, Chapter 3 allows us to examine the effectiveness of labels through a direct measure of cognition of risk.

Our findings indicate that, among Thai *male non-smokers,* the odds of susceptibility to smoking were approximately 27-28% lower among participants with high cognition of risk (“a lot”) than those with low cognition of risk (“a little” or “not at all”). With regard to smoking behavior, our results indicate that the odds of smoking initiation were 62-63% lower among participants with high cognition of risk than those

with low cognition of risk. Among Malaysian male youth smokers, the odds of smoking initiation were reduced by 40% among participants with high cognition of risk than those with low cognition of risk. The odds of reducing smoking between baseline and follow-up waves were significantly higher among participants with high cognition or risk than those with low cognition of risk. Surprisingly, we found that both the odds of being a high intensity smoker (>10 cigs) and the odds of increasing smoking intensity between baseline and follow-up were associated with high cognition of risk. However, we hypothesize that the observed association between risk cognition and high intensity smoking and increased intensity may be due, in part, to reverse causality, as heavy smokers are more likely to have experienced smokingrelated side effects, and are therefore more likely to have a higher cognition of the risks associated with smoking than non-smokers or lower intensity smokers. Taken together, results indicate that harm-related thoughts stimulated by labels (cognition of risk) is significantly associated with decreased odds of susceptibility to smoking, decreased odds of smoking initiation, and increased odds of a reduction in smoking intensity among male youth.

Additionally, our analyses revealed other covariates that were significantly associated with smoking outcomes, specifically: wave-pair (time), country of residence, peer smoking, and being of legal smoking age. Of particular interest was country of residence, as this is the first study to utilize postimplementation data from Malaysia, and differential effects by country have not been studied. Living in Thailand as compared to Malaysia was associated with increased odds of planning to smoke among male youth non-smokers, as well as an 89% increase in smoking susceptibility among male youth nonsmokers. These country differences reveal that the graphic labels may have been more effective in Malaysia than in Thailand, with increased odds of planning to smoke and susceptibility to smoking reported among Thai youth than Malaysian youth. It is possible that the long history of anti-tobacco campaigns and policies in Thailand primed youth to the warning labels, while the novelty of the messages in Malaysia may have increased their impact and effectiveness among youth [13, 151].

5.2.3. Chapter 4

Tables 5.3.a-b contain a summary of findings from Chapter 4. Similar to Chapter 3, Chapter 4 examines the impact of frequency of exposure to graphic cigarette warning labels; however, outcomes are studied among the adult smoker population and are limited to smoking behavioral outcomes. Furthermore,

as predictors of adult smoking are different than those of youth smoking, our models of smoking are varied. In our adult models, we control for demographic variables comprised of age, urban/rural status, education, and income. We also control for smoking-related variables, specifically: smoking frequency (daily v. nondaily), level of addiction (proxied by daily smoking intensity), type of cigarette smoked (factory made v. roll your own), noticing anti-smoking campaigns, and self-efficacy. To assess the effect of the graphic warning label policy on smoking behavior, we utilized a measure of label salience, known in this literature as "reading" labels. We examined two variant measures of label salience: *any* versus *no* salience, and *high* versus *low* salience. A secondary aim of this chapter was to examine the moderating effects of purchasing loose cigarettes on the association between label salience and smoking outcomes.

We found no significant association between high intensity smoking and label salience, except when examining loosies as an effect modifier. The odds of being a high intensity smoker ($\geq$15 cigarettes per day) among male smokers in Thailand and Malaysia was *decreased* by approximately 66% among participants reporting any label salience and purchasing loosies, relative to those reporting *any* label salience and *not* purchasing loosies. Similarly, the odds of being a high intensity smoker among male smokers in Thailand and Malaysia was *decreased* by approximately 67% among participants reporting *high* label salience and purchasing loosies, relative to those reporting *high* label salience and *not* purchasing loosies.

With regard to making a quit attempt between baseline and follow-up waves, those who reported *high* label salience were significantly more likely to make a quit attempt than those reporting *low* salience among all smokers in Thailand, male smokers in Thailand, and male smokers in Southeast Asia. Among participants who were quit at follow-up, the odds of attributing quit status to the graphic warning label was significantly higher among those reporting *any* label salience than those reporting *no* label salience among all quitters in Thailand, and male quitters in Thailand. Additionally, the odds of attributing quit status to the graphic warning label was significantly higher among those reporting *high* label salience than those reporting *low* label salience among all quitters in Thailand, and male quitters in Thailand.

Our findings indicate that our two variant measures of label salience (any v. no salience and high v. low salience) have seemingly comparable effects on smoking behavior, with the exception of quit

attempts. *High* salience was significantly associated with increased odds of making a quit attempt between baseline and follow-up, as compared to *low* salience, whereas we did not observe the same association when comparing *any* salience versus *no* salience. This indicates that the frequency with which people read labels does appear to have an effect on certain smoking outcomes.

All of our demographic and social factors were found to significantly affect adult smoking outcomes, albeit different outcomes among different sub-populations (smokers v. quitters, all adults v. males-only, Thais and Malaysians v. Thais-only). Of particular importance is the country of residence variable. We found that living in Thailand as compared to Malaysia was associated with reduced odds of *reduced smoking intensity* among adult male smokers; decreased odds of *planning to quit* within 6 months among adult male smokers; increased odds of making a *quit attempt*; decreased odds of *cessation*; and increased odds of attributing *quit status* to warning labels. With the exception of quit attempt, these country differences reveal that the graphic labels were more effective in Malaysia than in Thailand with regard to behavioral change. We hypothesize that this observed effect may be due to the priming effect of Thailand's longstanding history of anti-tobacco campaigns and policies. It is also interesting to note that adults in Thailand were more likely to attribute their quit status to the warning labels than adults in Malaysia. We hypothesize that warning labels may have indirectly affected Malaysians through social denormalization and a cultural shift around tobacco. This aligns with previous research that found that societal norms and individuals' perceptions of the social undesirability of smoking are significantly associated with smoking behavior in both Malaysia and Thailand [198]. As the graphic labeling policy was the first national tobacco control policy in Malaysia, it is possible the effect on social denormalization was more pronounced among Malaysians than Thais.

5.3. Limitations

There are several potential threats to the validity of our research findings. The two main threats are history and underreporting of smoking, particularly among youth. With regard to history, policies and anti-smoking campaigns were implemented over the course of the study timeframe which may contaminate findings. These peripheral anti-tobacco campaigns were controlled for as best as possible, by including a measure of "noticed anti-smoking campaigns" in our adult analyses. We did not control for

anti-smoking campaigns in our youth analyses, as we were limited by a smaller sample size which hindered model convergence.

Examples of other policy measures employed during the course of our study period include: increased taxation, bans on tobacco advertising, ban on price promotions for tobacco products, smoking bans, and bans on use of misleading terms and descriptors. Taxation is a particular important factor, as youth are especially sensitive to price changes in cigarettes [199], as are certain sub-populations of adults, specifically younger adults and those with lower income [200].

The self-reported measure of smoking behavior may also be viewed as a limitation of this research; although behaviors were not validated by biochemical tests, studies have indicated that selfreported smoking status is validated by measured serum cotinine levels, which yield similar prevalence estimates. Underreporting of smoking behavior is more common among younger adolescents and cases where the social desirability is strongest. The ITC team tried to minimize social desirability bias by having youth complete paper and pencil surveys in a private area of the home and by stressing the confidentiality of the findings. Nevertheless, the actual prevalence rates of youth smoking may be somewhat higher than indicated by the data as some underreporting is likely greater for surveys conducted in the home. There has been some evidence that underreporting of smoking in Malaysia may be particularly high in school surveys given that smoking is a disciplinary offence for school students in Malaysia.

Another potential limitation of this study is that the policy of interest was not implemented at one specific time; the policy was rolled out across provinces/states in Thailand and Malaysia over the course of a year. Further, we do not measure exposure to the graphic warning labels directly, instead, we use proxies such as country (chapter 2), cognition of risk (chapter 3), and label salience (chapter 4). The use of effective proxies was imperative given the correlation between exposure to warning labels and smoking behavior. Preliminary analyses (not presented) demonstrated this perverse effect and indicated those who were exposed to labels more frequently smoked more, and those who reported smoking more were exposed to the label. This reverse-causality could not be disentangled, as such, effective proxies for exposure were utilized.

Additionally, the relatively small size of our Malaysian sample hindered our ability to conduct Malaysia-specific analyses. Instead, after ensuring there were no significant country-by-predictor

interaction terms, we combined data from both countries. Similarly, the small number of female smokers in our sample, while representative of smoking trends in Southeast Asia, prevented us from examining behavioral outcomes among females only.

Furthermore, the mode of data collection is slightly varied across countries: in Thailand, data were collected via face-to-face survey for adults; in Malaysia, data were collected via face-to-face survey, as well as via telephone survey. Both countries obtain youth data via self-administered mail survey. Additionally, for reasons of administration and cost, the number of primary sampling units within strata was relatively small, and the sample of households within the primary sampling units was geographically clustered. Such a sample cannot be as representative of the national population as a simple random sample of the same number of households.

Furthermore, as this is a longitudinal survey, drop-out among participants is not uncommon. We do not account for drop-out in our analyses, and suggest that future research accounts for this with statistical methodologies such as Weighted Generalized Estimating Equations (GEE) [183]. Weighted GEE may reduce bias introduced by missing observations caused by dropouts or skipped interviews, assuming data are missing at random.

Lastly, though there were many models fit and hypotheses tested, we did not adjust for multiple testing, hence we cannot be certain that certain positive results are not due to Type I error (i.e., chance). However, we tried to support out positive results with meaningful explanations. This study was exploratory in nature, even as we tried to drive the models by theoretical and topic-oriented considerations.

5.4. Policy recommendations and future research directions

Tobacco control has a long history of employing theory and evidence in developing interventions. The need for this culture of evidence-based practice is driven, in part, by the need to make compelling cases to government officials and policy-makers in the face of opposition from a powerful tobacco industry, and the need for persuasive communications to the community asking them to change a behavior which is well entrenched, and involves consuming an addictive substance.

Our results are consistent with prior research demonstrating the effectiveness of graphic cigarette warning labels to increase salience and stimulation of cognition reactions that ultimately lead to changes in behavioral intention and behavioral outcomes. The study provides strong support for the introduction of graphic warning labels in other developing countries where benefits may be even greater given the lower literacy rates and generally lower levels of readily available health information on the risks of smoking.

Future research should further investigate the impact of graphic warning labels on smoking outcomes, particularly among females (both among youth and adults). The female market represents an opportunity for tobacco companies, as prevalence among this sub-population remains low. Our sample of female smokers was extremely limited, thus hindering our ability to conduct female-specific analyses. Furthermore, our sample of adolescent and young teenage smokers (under the age of 15) was also limited, limiting our ability to conduct analysis of age-effects among youth.

The need for tobacco control strategies in other Southeast Asian countries is paramount. Indonesians represent a particularly vulnerable population that is being targeted heavily by tobacco companies. While smoking rates are declining in many western countries, the opposite is happening in the Republic of Indonesia, where over 60% of the male population regularly smokes and uses tobacco. Smoking has become ingrained in Indonesian culture where some children are having their first cigarette by the age of four. Indonesia's economy is dependent upon the tobacco industry, which has proven to be extremely profitable. Furthermore, many Indonesians make their livelihood through tobacco farming, and are surrounded by cigarettes from an early age [201]. Smoking regulations in Indonesia are few and far between, making residents an easy target for smoking uptake. Indonesia represents a developing country in Southeast Asia that stands to benefit immensely from increased tobacco control policies, such as the implementation of graphic cigarette warning labels.

Given their great reach, warning labels on cigarette packs may be one of the few tobacco control policies that have the potential to reduce communication inequalities across populations. As the attention of the tobacco companies has shifted to developing countries, the effectiveness of graphic warning labels among Southeast Asians suggests an opening for effective strategies to communicate risk, prevent initiation, reduce intensity, and promote cessation. Furthermore, Mahood (1999) argues that an effective

warning system will create a situation of informed consent regarding the nature of the risks, the magnitude of the dangers and the probability of occurrence among smokers regarding the risks of tobacco smoke [38, 202]. As a communication device, on-pack messages should follow the principles of communication theory and practice. Policies that establish strong graphic warning labels on tobacco packaging may be instrumental in reducing the toll of the tobacco epidemic, particularly within vulnerable populations [10].

Table 5.1. Summary of significant findings from Chapter 2.

	Thailand (Ref=Malaysia)	
	Males	**Females**
Plan to Smoke (Non/Never-smokers)	X	REDUCED ODDS
Plan to Continue Smoking (Smokers)	REDUCED ODDS	N/A
Plan to Quit (<6 mo)	INCREASED ODDS	N/A
Susceptibility	X	REDUCED ODDS
Label Salience (Notice)	INCREASED ODDS	INCREASED ODDS
Cognition of Risk	X	INCREASED ODDS

Table 5.2. Summary of significant findings from Chapter 3.

	Thailand		Thailand + Malaysia	
	[High cognition of risk v. low cognition of risk [(ref)]			
	Males	**Females**	**Males**	**Females**
Plan to Smoke (Non/Never-smokers)	X	X	X	X
Plan to Continue Smoking (Smokers)	X	X	X	X
Plan to Quit (<6 mo)	X	X	X	X
Susceptibility	REDUCED ODDS	X	X	X
Smoking Initiation	REDUCED ODDS	N/A	N/A	N/A
High Intensity Smoking	INCREASED ODDS	N/A	N/A	N/A
Quit Attempt (<1 year)	X	N/A	N/A	N/A
Increased Intensity	INCREASED ODDS	N/A	N/A	N/A
Reduced Intensity	INCREASED ODDS	N/A	N/A	N/A

Table 5.3.a. Summary of significant findings from Chapter 4 (by label salience).

	Thailand		Thailand + Malaysia
	Positive Salience v. Negative Salience [(ref)][a]		
	Males	**Males + Females**	**Males**
High Intensity Smoking	X	X	X
Reduced Intensity	X	X	X
Plan to quit (<6 mo)	X	X	X
Quit attempts	INCREASED ODDS	INCREASED ODDS	INCREASED ODDS
Cessation	X	X	X
Quit Because of Label	INCREASED ODDS	INCREASED ODDS	X

[a]Positive salience categories (*high* and *any*) and negative salience categories (*low* and *no*) are combined for purposes of summarization.

Table 5.3.b. Summary of significant findings from Chapter 4 (by label salience*loosies).

	Thailand + Malaysia
	Salience*buying loosies v. salience*not buying loosies)][a]
	Males
High Intensity Smoking	REDUCED ODDS
Reduced Intensity	X
Plan to quit (<6 mo)	X
Quit attempts	X
Cessation	X
Quit Because of Label	INCREASED ODDS

[a]Salience categories (*high* and *any*) are combined for purposes of summarization.

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Socioeconomic indicators as predictors of all cause mortality in the United States

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ABSTRACT

The theoretical social construct of socioeconomic status (SES) if often difficult to quantify. Attempts to define this construct result in commonly used indicators based on education, income, occupation and accumulated wealth. Despite this, there is no consistent collection of socioeconomic status indicators across population surveys. The aim of this study is to investigate related SES predictors from the National Health Interview Survey (NHIS) as drivers for all cause mortality. Leveraging linkage to the National Death Index (NDI) data, the time-to-event indicator was calculated for nearly all participants (94%). Principal Components Analysis (PCA) for categorical variables was used to identify a set of risk scores most associated with all cause mortality.A survey Cox proportional hazards regression was then used to create a composite risk score that was found to be predictive of all cause mortality. A Kaplan-Meier plot shows the predictive ability of the tertiles of the composite risk score. All composite scores were significantly influential influential to survival. The dental visits, insurance and education component had the greatest protective effect of the event compared to the other composite scores. This approach can be used to combine several SES indicators into one composite risk score.

INTRODUCTION

The theoretical constructs related to social status are based on a variety of indicators such as education, occupation, household income and accumulated wealth. These indicators are extensively studied under the umbrella term of socioeconomic status (SES). The effects of SES on health outcomes and in disparities research have been widely investigated alongside race/ethnicity.[1,2] However, due to the dynamic nature of SES, difficulty of collection, and lack of precision and reliability,[3] there is no agreement on a particular set of indicators for socioeconomic status in population surveys. Surveys like the Demographic and Health Survey have data-specific indices for measuring SES although this measure does not translate well into multiple countries with varying levels of wealth.[4] At least in the United States, there is no comprehensive set of indicators for SES that are routinely collected in population-wide surveys.[1,5] In 1997, Krieger and colleagues found that only two-thirds of the states included education level information of mothers in birth certificates and one-fourth of states published that of fathers.[6] The authors found no data was collected concerning income level for any of the national registries or certificates investigated at the time.[6] The latest Health, United States 2013 report prepared by the CDC contains important socioeconomic indicators like education, household poverty level and insurance status on the majority of tables presented.[7] Krieger and colleagues detailed the need for carefully considered measures of socioeconomic position that would account for concerns of privacy and confidentiality.[6]

Typically, research results report on the relationship between SES and an outcome of interest with little to no explanation on the mechanism of the effect.[3] Shavers makes a distinction between two types of SES measures: 1) compositional measures 2) contextual measures.[3] Compositional measures of SES focus on indicators that directly relate to the individual such as

occupation, education, and income and wealth. Contextual measures of SES are related to the individual's environment and can include measures of neighborhood, county, as well as census tract levels of SES.[3]

Shavers contends that contextual measures of SES often do not correlate well with individual measures of SES.[3] This is likely due to the generalization or aggregation of region characteristics in terms of SES levels. Contextual measures of SES are sometimes the only option for approximating SES at the aggregate level when such data is not available at the individual one.[8] Therefore, census data is often used to obtain an average measure of socioeconomic status at the tract level.[5]

It is important to note that individual measures of SES are not without flaws. Problems can arise when measures of SES in particular groups of people (e.g. retirees) do not reliably reflect the true SES, especially in measures of occupation.[1] Individual measures of education fail to capture on the job training opportunities, other personal capital investments made,[1] and shifts in the distribution of education. Household measures of income may not reflect accurate levels of SES if there is unequal access to household wealth.[1] Despite this, Duncan and colleagues support the use of household income as an optimal measure of SES for being more sensitive to changes in the SES and health relationship. Particularly, disposable income is a good indicator of standard of living and the life opportunities experienced.[1] Age, race-ethnicity and sex are known to vary in the distribution of SES indicators.[1] The literature on SES and mortality in the NHIS has shown the education gradient of risk among preventable and less preventable diseases.[9]

The literature tends to focus on individual compositional measures of SES, such as income, occupation, and education [1–3,9]. The present study aims to compare and combine groups of related individual SES indicators from the National Health Interview Survey (NHIS) in order

to create a single risk score for all cause mortality. These groups of SES indicators can be considered social drivers for all cause mortality within the scope of the NHIS and the linked National Death Index (NDI) dataset. In contrast to singular measures of SES, combinations of SES predictors can be more advantageous in predicting mortality. In turn, these sets of SES predictors can be further investigated in order to target and focus on modifiable risk factors.

METHODS

Data

The National Health Interview Survey (NHIS) is an ongoing cross-sectional survey conducted by the National Center for Health Statistics a division of the Center for Disease Control and Prevention (CDC). The NHIS monitors national health trends by asking participants about a wide range of health topics.[10] It is a nationally representative sample of noninstitutionalized adults, 17 years of age or over, residing in the United States via personal household interviews. The NHIS survey data was recently linked to mortality data from the National Death Index (NDI).[11] The mortality data linkage was done based on probabilistic matching of NDI records with NHIS survey data by the CDC up until the year 2011.[11] The publicly available data were be obtained from the CDC website (www.cdc.gov/nchs) and included survey years from 1998 to 2003 due to similar complex survey sampling strategies. In order to combine across years, survey weights were averaged by the number of years in the entire data thus, all weight estimates were divided by 6 for each year included in the data. All analyses were done using R statistical software (version 3.1.2).[12] The "survey" package written by Thomas Lumley and was used for adjusting for complex survey sampling. The "SAScii" and "readr" packages written by Anthony D'Amico and Hadley Wickham, respectively, were used to read and parse fixed width and SAS files downloaded from the CDC FTP website.

Data analysis plan

Widely used methods for dimension reduction are based on the principal component analysis (PCA) or factor analysis.[13] Separate PCA analyses were run each for (1) imputed income and poverty ratios and (2) for categorical variables related to health care access, utilization, insurance status and education. Imputed income variables included household income and poverty ratio, which were provided in the data. These variables were obtained from multiple imputation procedures (5 in total) by survey year. Pearson correlations were used to calculate the correlation matrix for the income and poverty ratio component. Kolenikov and colleagues highlight the consequences of using of discrete variables in PCA without the appropriate methodology.[14] Hence, polychoric correlations were used to create a correlation matrix to derive the principal components for these discrete categorical variables. Insurance status was a recoded variable derived from a combination of coverage status and private insurance coverage.

The time-to-event indicator was calculated from the linked mortality dataset simply by obtaining the difference between the year of death and the year the survey was administered. Participants without a valid year of death are assumed to be alive up until 2011, the last date of collection of mortality data, and were right censored. Mortality data was then merged to survey and income data by participant-level identification numbers.

The survival function was plotted using nonparametric Kaplan-Meier curves. Finally, a Cox Proportional Hazards model for survey data was used to build a model that included the extracted components from the PCA analyses controlling for age and gender.

Measures

Principal Components

Items under the first component describe the ability to afford health care services like

prescription medicines, mental health care, and dental care by asking, “During the past 12 months, was there any time when you needed any of the following but didn’t get it because you couldn’t afford it?” These items load highly and are part of the first component named “Affordability of Care.” The second component describes variables that are related to use and frequency of primary health care. Questionnaire items that load highly in this component ask, “Is there a place that you usually go to when you are sick or need advice about your health?” and “About how long has it been since you last saw or talked to a doctor or other health care professional about your own health?” The last component included dental health care use, insurance type and educational attainment. High loading questionnaire items in this component asked, “About how long has it been since you last saw or talked to a dentist? Include all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists” and “What is the highest level of school you have completed or the highest degree you have received?” Detailed descriptions of the items included in the principal components are provided in Appendix I.

RESULTS

Merging with National Death Index records resulted in a loss of 6% of participants; thus, a total of 179,012 participants were included in the analyses. The mortality event occurred in 11.5 % of the survey sample with a standard error of 0.001. The survey adjusted mean age of the sample was 45 years with a standard error of 0.10. Fifty-two percent of the survey sample were female.

Table 1 shows the results of the principal components analysis based on select questions from the adult sample related to socioeconomic status. Variables with component loadings greater than 0.8 are shaded dark gray. Participants able to afford health care services and

prescription medicines score highly in the first component of affordability of care. Participants with a usual primary care location and who have recently seen their primary care provider score highly in the primary care use and frequency component. Participants with high education, private insurance status and recent dental visits score highly in the dental, insurance, and education component.

Table 2 shows the results of the survey Cox proportional hazards regression model that includes all components and covariates (including income, age, and gender). Affordability of care, income, and the dental, insurance, and education component are protective of all cause mortality. A one unit change in the log of the hazard ratio for any of these components controlling for all other components and covariates results in significantly increased survival. The primary care use and frequency component was slightly adverse to survival but close to the null value of one (HR = 1.051, 95% CI = 1.03 - 1.07). A one unit change in the log of the hazard ratio for the dental visit, insurance, and education component is significantly associated with increased survival. The age and gender covariates below the dashed line were adjusted for in the Cox model.

Figure 1 represents a Kaplan-Meier survival curve for all cause mortality with right censored data by tertiles of the risk score. The third tertile had the most favorable cumulative survival probabilities after 13 years (98%). The first tertile of the composite risk score had a lower cumulative survival probability after 13 years (72%).

DISCUSSION

Principal components Cox regression is a useful method for combining related predictors and can be applied to a more extensive list of socioeconomic status variables. Being able to afford health care services and prescription medicine is an important predictor of mortality. The

use of primary care and familiarity with such access also plays a role in survival. Interestingly, the accessibility to dental care, education, and insurance status component is significantly protective of mortality. A combination of components puts the focus on the importance of the tenets of a functional health care system, accessibility, cost, and quality. This demonstrates the relevance between overall health and oral health. Insurance and education were key players in survival outcomes. Imputed income, a major indicator of socioeconomic status is unsurprisingly related to mortality as it likely affects a number of unmeasured covariates that can be favorable to survival.

An important limitation to this study was the availability of socioeconomic status variables collected as part of the adult sample questionnaire. Additional inclusion of SES indicators such as accumulated wealth and occupation would add pertinent information to estimate the socioeconomic status construct. Being that the NHIS is a series of cross-sectional surveys, there is no ability to capture time varying SES indicators in order to better understand the time frame at which certain SES indicators change. The SES components used in the Cox proportional hazards model were limited to the time of the survey and thus, do not account for any long term changes in socioeconomic status.

This study benefitted from a large the sample size by combining across six years of NHIS data collection. NDI database linking is resourceful due to its comprehensive assessment of mortality status from death records year after year. SES groups that are protective of mortality warrant further investigation and can guide interventions for improving health outcomes at a broader scale. Existing literature supports the influence of education as a gradient for disease risk.[9] Future studies can focus on predetermined sets of related SES indicators that are most practical for intervention purposes.

Variable	Affordability of Care	Primary Care Use and Frequency	Dental, Insurance, & Education
Usual Care Location	0.165	0.833	0.105
Unable to afford in past 12 months			
Prescription Medicines	0.914	-0.026	0.184
Mental Health Care or Counseling	0.911	0.046	0.016
Dental Care	0.901	0.101	0.112
How long since last dental visit?	0.156	0.27	0.677
How long since last doctor visit?	-0.099	0.853	0.115
Insurance status (none, public, private)	0.429	0.405	0.545
Education	-0.004	-0.052	0.897

Table 1. Adult sample item loadings for proximal and distal measures of SES. Columns represent resulting components from the principal components analysis for categorical variables. Dark shading indicates component loadings greater than the 0.8. Lighter shading indicates values between 0.4 and 0.8.

Component	Hazard Ratio	Log HR	SE of Log HR	95% CI
Affordability of Care	0.881	-0.127	0.012	(0.86 - 0.90)
Primary Care Use & Frequency	1.058	0.056	0.011	(1.03 - 1.08)
Dental, Insurance & Education	0.788	-0.238	0.009	(0.77 - 0.80)
Income	0.826	-0.191	0.012	(0.81 - 0.85)
Age (M = 45)	1.086	0.083	0.001	(1.09 - 1.09)
Gender (Male)	1.598	0.469	0.017	(1.55 - 1.65)

Table 2. Multivariable survey Cox proportional hazards regression coefficients for SES components. Age and gender were controlled for in the model.

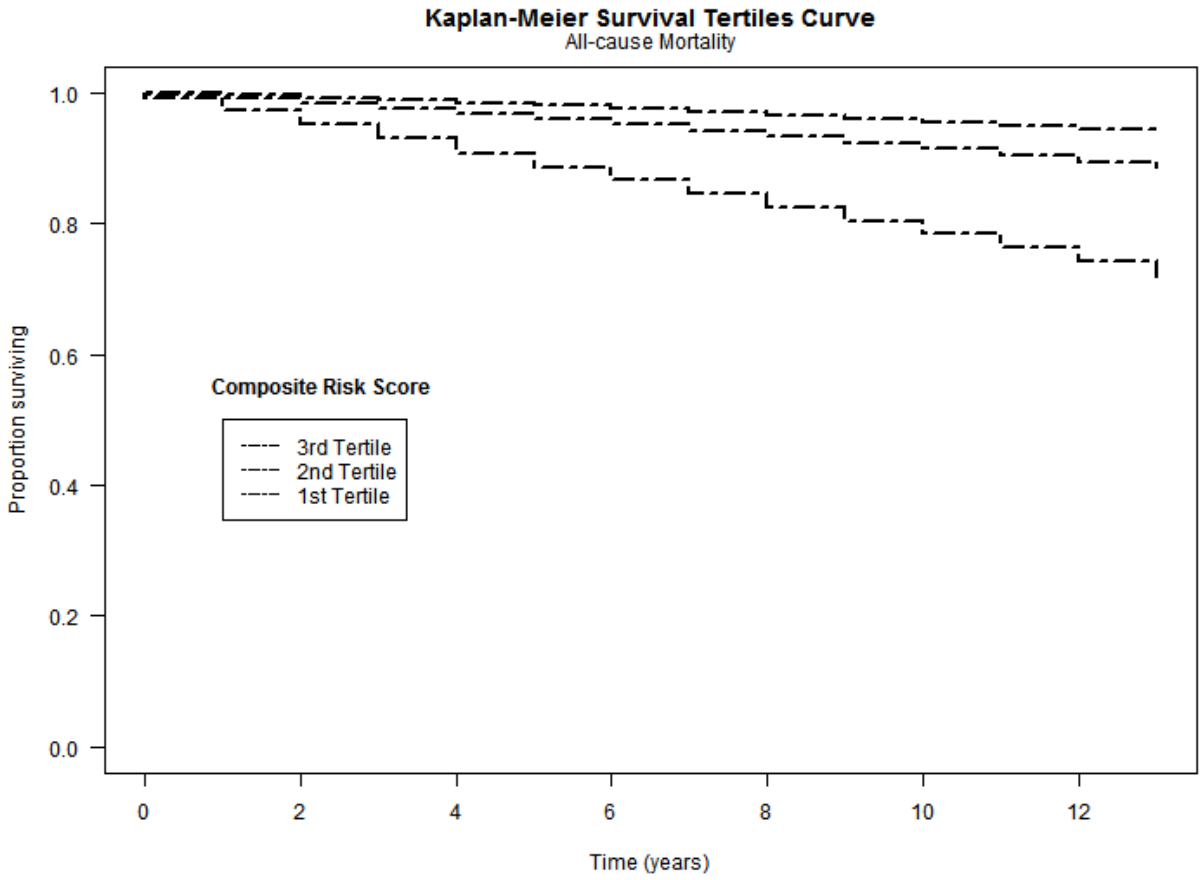

Figure 1. Kaplan-Meier Survival Curve for All-cause Mortality

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Appendix I.

Supplemental Table S1. Questionnaire Item Details

Questionnaire Item

Q1. About how long has it been since you last saw or talked to a doctor or other health care professional about your own health?

Q2. About how long has it been since you last saw or talked to a dentist? Include all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists.

Response scale

(1) Never
(2) More than 5 years ago
(3) More than 2 years, but not more than 5 years ago
(4) More than 1 year, but not more than 2 years ago
(5) More than 6 months, but not more than 1 year ago
(6) 6 months or less
(NA) Refused
(NA) Don't know

Questionnaire Item

Q1. Is there a place that you usually go to when you are sick or need advice about your health?

Response scale

(1) Don't Know
(2) There is no place
(3) Yes
(4) There is more than one place
(NA) Refused

Questionnaire Item

Insurance status (recoded variable)
(1) None
(2) Public
(3) Private

Questionnaire Item

Q1. What is the highest level of school you have completed or the highest degree you have received?

Response scale

(1) Less than High School

(2) High School or GED

(3) Some College or Technical/Vocational or Academic Associate of Arts

(4) Bachelor's, Master's, Professional or Doctoral degree

Questionnaire Items

Q1. During the past 12 months, was there any time when you needed any of the following but didn't get it because you couldn't afford it?

Q1.1 Prescription medicines
Q1.2 Mental health care or counseling
Q1.3 Dental care (including check-ups)

Response scale

(1) Yes
(2) No
(NA) Refused
(NA) Don’t know

Socioeconomic indicators as predictors of all cause mortality in the United States

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ABSTRACT

The theoretical social construct of socioeconomic status (SES) if often difficult to quantify. Attempts to define this construct result in commonly used indicators based on education, income, occupation and accumulated wealth. Despite this, there is no consistent collection of socioeconomic status indicators across population surveys. The aim of this study is to investigate related SES predictors from the National Health Interview Survey (NHIS) as drivers for all cause mortality. Leveraging linkage to the National Death Index (NDI) data, the time-to-event indicator was calculated for nearly all participants (94%). Principal Components Analysis (PCA) for categorical variables was used to identify a set of risk scores most associated with all cause mortality.A survey Cox proportional hazards regression was then used to create a composite risk score that was found to be predictive of all cause mortality. A Kaplan-Meier plot shows the predictive ability of the tertiles of the composite risk score. All composite scores were significantly influential influential to survival. The dental visits, insurance and education component had the greatest protective effect of the event compared to the other composite scores. This approach can be used to combine several SES indicators into one composite risk score.

INTRODUCTION

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Data

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The survival function was plotted using nonparametric Kaplan-Meier curves. Finally, a Cox Proportional Hazards model for survey data was used to build a model that included the extracted components from the PCA analyses controlling for age and gender.

Measures

Principal Components

Items under the first component describe the ability to afford health care services like

prescription medicines, mental health care, and dental care by asking, “During the past 12 months, was there any time when you needed any of the following but didn’t get it because you couldn’t afford it?” These items load highly and are part of the first component named “Affordability of Care.” The second component describes variables that are related to use and frequency of primary health care. Questionnaire items that load highly in this component ask, “Is there a place that you usually go to when you are sick or need advice about your health?” and “About how long has it been since you last saw or talked to a doctor or other health care professional about your own health?” The last component included dental health care use, insurance type and educational attainment. High loading questionnaire items in this component asked, “About how long has it been since you last saw or talked to a dentist? Include all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists” and “What is the highest level of school you have completed or the highest degree you have received?” Detailed descriptions of the items included in the principal components are provided in Appendix I.

RESULTS

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Gender (Male)	1.598	0.469	0.017	(1.55 - 1.65)

Table 2. Multivariable survey Cox proportional hazards regression coefficients for SES components. Age and gender were controlled for in the model.

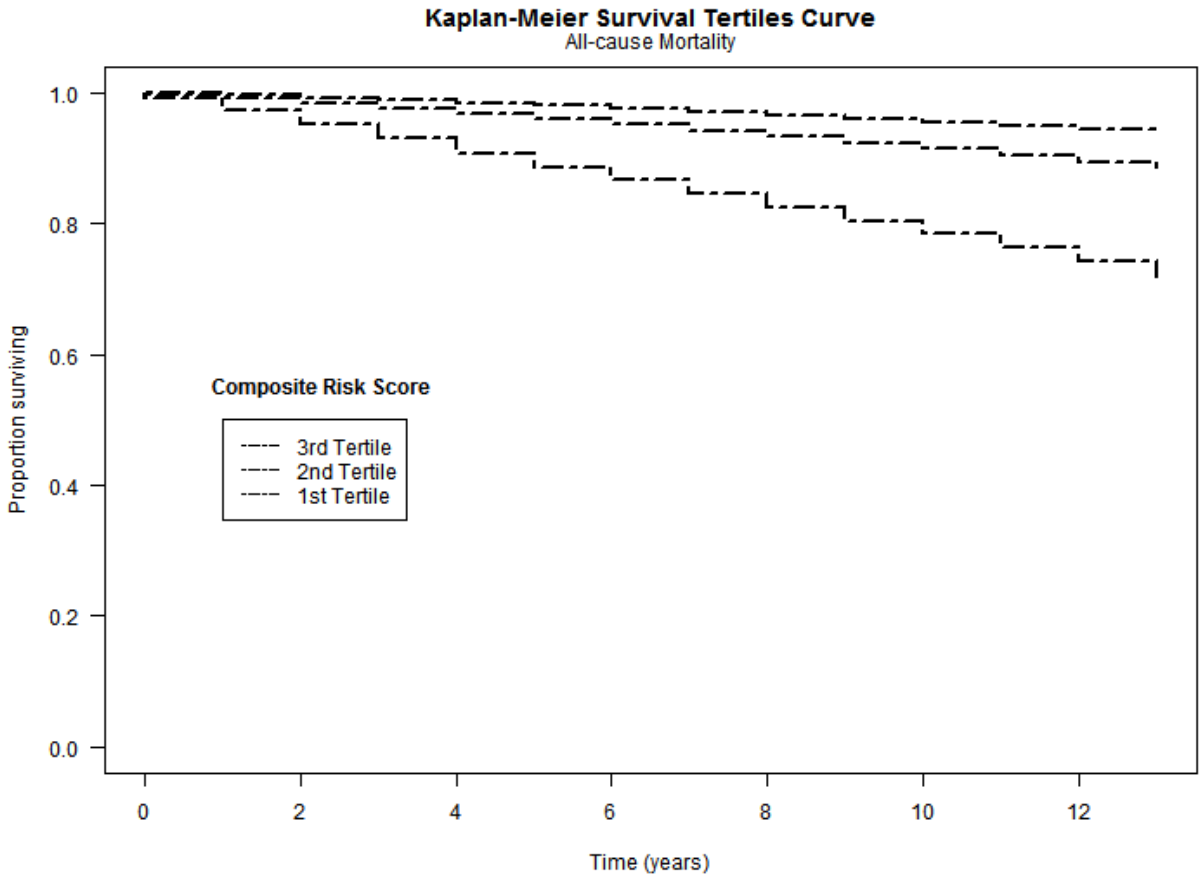

Figure 1. Kaplan-Meier Survival Curve for All-cause Mortality

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Appendix I.

Supplemental Table S1. Questionnaire Item Details

Questionnaire Item

Q1. About how long has it been since you last saw or talked to a doctor or other health care professional about your own health?

Q2. About how long has it been since you last saw or talked to a dentist? Include all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists.

Response scale

(1) Never
(2) More than 5 years ago
(3) More than 2 years, but not more than 5 years ago
(4) More than 1 year, but not more than 2 years ago
(5) More than 6 months, but not more than 1 year ago
(6) 6 months or less
(NA) Refused
(NA) Don't know

Questionnaire Item

Q1. Is there a place that you usually go to when you are sick or need advice about your health?

Response scale

(1) Don't Know
(2) There is no place
(3) Yes
(4) There is more than one place
(NA) Refused

Questionnaire Item

Insurance status (recoded variable)
(1) None
(2) Public
(3) Private

Questionnaire Item

Q1. What is the highest level of school you have completed or the highest degree you have received?

Response scale

(1) Less than High School

(2) High School or GED

(3) Some College or Technical/Vocational or Academic Associate of Arts

(4) Bachelor's, Master's, Professional or Doctoral degree

Questionnaire Items

Q1. During the past 12 months, was there any time when you needed any of the following but didn't get it because you couldn't afford it?

Q1.1 Prescription medicines
Q1.2 Mental health care or counseling
Q1.3 Dental care (including check-ups)

Response scale

(1) Yes
(2) No
(NA) Refused
(NA) Don’t know

Socioeconomic indicators as predictors of all cause mortality in the United States

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ABSTRACT

The social construct of socioeconomic status (SES) if often difficult to quantify. Attempts to define this construct result in commonly used indicators based on education, income, occupation and accumulated wealth. Despite this, there is no consistent collection of socioeconomic status indicators across population surveys. The aim of this study is to investigate related SES predictors from the National Health Interview Survey (NHIS) as social drivers for all cause mortality. Leveraging linkage to the National Death Index (NDI) data, the time-to-event indicator was calculated for nearly all participants (94%). Using Principal Components Analysis (PCA), socioeconomic status indicators related to affordability of prescriptions and health care services tended to correlate highly with each other. Indicators related to access to care, gender, and having a usual place of care were also correlated. Having access to dental care was differentiated from having access to primary care and resulted as a separate component in the analysis. Results from the survey Cox proportional hazards regression show that access to both primary and dental care, as well as the affordability of such care, are all important predictors associated with mortality.

INTRODUCTION

The theoretical constructs related to social status are based on a variety of indicators such as education, occupation, household income and accumulated wealth. These indicators are extensively studied under the umbrella term of socioeconomic status (SES). The effects of SES on health outcomes and in disparities research have been widely investigated alongside race/ethnicity.[1,2] However, due to the dynamic nature of SES, difficulty of collection, and lack of precision and reliability,[3] there is no agreement on a particular set of indicators for socioeconomic status in population surveys. Surveys like the Demographic and Health Survey have data-specific indices for measuring SES although this measure does not translate well into multiple countries with varying levels of wealth.[4] At least in the United States, there is no comprehensive set of indicators for SES that are routinely collected.[1,5] In 1997, Krieger and colleagues found that only two-thirds of the states included education level information of mothers in birth certificates and one-fourth of states published that of fathers.[6] The authors found no data was collected concerning income level for any of the national registries or certificates investigated at the time.[6] The latest Health, United States 2013 report prepared by the CDC contains important socioeconomic indicators like education, household poverty level and insurance status on the majority of tables presented.[7] Krieger and colleagues detailed the need for carefully considered measures of socioeconomic position that would account for concerns of privacy and confidentiality.[6]

Typically, research results report on the relationship between SES and an outcome of interest with little to no explanation on the mechanism of the effect.[3] Shavers makes a distinction between two types of SES measures: 1) compositional measures 2) contextual measures.[3] Compositional measures of SES focus on indicators that directly relate to the individual such as

Commented [JD1]: In what context do you mean? Public health studies?

Commented [JD2]: They are only really considered compositional in the context of neighborhood effects. Otherwise they are individual-level effects.

occupation, education, and income and wealth. Contextual measures of SES are related to the individual's environment and can include measures of neighborhood, county, as well as census tract levels of SES.[3]

Shavers contends that contextual measures of SES often do not correlate well with individual measures of SES.[3] This is likely due to the generalization or aggregation of region characteristics in terms of SES levels. Contextual measures of SES are sometimes the only option for approximating SES at the aggregate level when such data is not available at the individual one.[8] Therefore, census data is often used to obtain an average measure of socioeconomic status at the tract level.[5]

It is important to note that individual measures of SES are not without flaws. Problems can arise when measures of SES in particular groups of people (e.g. retirees) do not reliably reflect the true SES, especially in measures of occupation.[1] Individual measures of education fail to capture on the job training opportunities and other personal capital investments made.[1] Household measures of income may not reflect accurate levels of SES if there is unequal access to household wealth.[1] Despite this, Duncan and colleagues support the use of household income as an optimal measure of SES for being more sensitive to changes in the SES and health relationship. Particularly, disposable income is a good indicator of standard of living and the life opportunities experienced.[1] Age, race-ethnicity and sex are known to have differential effects on the measurement of SES.[1]

The present study aims to extract groups of related SES indicators from the National Health Interview Survey (NHIS) and to describe sets of indicators that are social drivers for all cause mortality within the scope of the NHIS by using the National Death Index (NDI) linked data. And what is the goal? To better understand which SES indicators should be intervened on,

Commented [JD3]: Perhaps, but it can also be a better measure because it is less noisy than individual measures and thus smooths out measurement error.

Commented [JD4]: And the distribution of educational attainment has changed dramatically over time so it doesn't always mean the same thing.

Commented [JD5]: What do you mean by "effects on the measurement of?"

or is this completely predictive modeling without any causal framework? What gap in the literature is this paper hoping to fill? Any discussion of previous literature on SES and mortality using NHIS and how this fits in?

METHODS

Data

The National Health Interview Survey (NHIS) is an ongoing cross-sectional survey conducted by the National Center for Health Statistics a division of the Center for Disease Control and Prevention (CDC). The NHIS monitors national health trends by asking participants about a wide range of health topics.[9] It is a nationally representative sample of noninstitutionalized adults, 17 or over, residing in the United States via personal household interviews. Mortality data from the National Death Index (NDI) was recently linked to the NHIS survey data which was obtained until the year 2006.[10] Mortality data linkage was done based on probabilistic matching of NDI records with NHIS survey data by the CDC up until the year 2011.[10] The publicly available data were be obtained from the CDC website (www.cdc.gov/nchs) and included survey years from 1998 to 2003 due to similar complex survey sampling strategies. In order to combine across years, survey weights were averaged by the number of years in the entire data thus, all weight estimates were divided by 6 for each year included in the data. All analyses were done using R statistical software (version 3.1.2).[11] The "survey" package written by Thomas Lumley and was used for adjusting for complex survey sampling. The "SAScii" and "readr" packages written by Anthony D'Amico and Hadley Wickham, respectively, were used to read and parse fixed width and SAS files downloaded from the CDC FTP website.

Commented [JD6]: 2006 or 2011? Not consistent with previous sentence.

Data analysis plan

Widely used methods for dimension reduction are based on the principal component

analysis (PCA) or factor analysis.[12] Separate PCA analyses were run each for (1) imputed income and (2) categorical variables related to health care access and utilization (including gender). Imputed income variables included household income and poverty ratio. These variables resulted from multiple imputation (5 in total) procedures for each survey year and were already included in the data. Pearson correlations were used to calculate the correlation matrix for the income component. Kolenikov and colleagues point out that the use of discrete variables in PCA requires different methodology.[13] Polychoric correlations were used to create a correlation matrix in order to calculate the principal components for discrete categorical variables.

Commented [JD7]: What is the justification for this?

Commented [JD8]: What about other SES variables? Education? What else are you using? Not clear here—all of your measures/variables should be described very specifically.

The time-to-event indicator was calculated from the linked mortality dataset simply by obtaining the difference between the year of death and the year the survey was administered. Participants without a valid year of death are assumed to be alive up until 2011, the last date of collection of mortality data, and were right censored. Mortality data was then merged to survey and income data by participant-level identification numbers.

The survival function was plotted using the nonparametric Kaplan-Meier method. Finally, a Cox Proportional Hazards model for survey data was used to build a model that included the extracted components from the PCA analyses.

RESULTS

Merging with National Death Index records resulted in a loss of 6% of participants; thus, a total of 179,012 participants were included in the analyses. The mortality event occurred in 11.5 % of the survey sample with a standard error of 0.001. Using survey weights, the mean age of the survey sample was 45 years of age with a standard error of 0.10. The majority of participants were female (52 %).

Table 1 shows the results of the principal components analysis based on select questions from the adult sample related to socioeconomic status. Variables with high principal component loadings are shaded gray. Items shaded under the first component describe the inability to afford health care services like prescription medicines, mental health care, and dental care by asking, "During the past 12 months, was there any time when you needed any of the following but didn't get it because you couldn't afford it?" These items load highly and are part of the first component called "Affordability." The second component resulting from the PCA describes variables that are related to access and familiarity to primary care. Questionnaire items in this component ask, "Is there a place that you usually go to when you are sick or need advice about your health?" and "About how long has it been since you last saw or talked to a doctor or other health care professional about your own health?" Interestingly, gender also loaded moderately to this component. The last component included a single item that was differentiated from the rest, this item asked, "About how long has it been since you last saw or talked to a dentist? Include all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists."

Commented [JD9]: Describe all of this in your measures section, not results.

Table 2 shows the results of the survey Cox proportional hazards regression model that includes all components and covariates (including the income component and age). Affordability, primary care, and income components are protective of all-cause mortality. A one unit change in the log of the hazard ratio for any of these components controlling for all other components results in significantly increased survival. Both the dental visits component and age were adverse to survival. A one unit change in the log of the hazard ratio for the dental visit component is significantly associated with decreased survival. As expected, a one unit change in age was significantly associated with decreased survival.

Figure 1 represents a Kaplan-Meier survival curve for all cause mortality with right censored data. The vast majority of participants had favorable cumulative survival probabilities. A little less than 90% of participants survived after 12 years from the year of survey administration.

DISCUSSION

Principal components cox regression is a useful method for combining related predictors and can be applied to a more extensive list of socioeconomic status variables. Being able to afford health care services and prescription medicine are important predictors of mortality. The level of access to primary care and familiarity with such access also play a role in survival. Interestingly, accessibility to dental care is also an important predictor of mortality. This highlights the importance of oral health and its relationship to overall health as a key player in survival outcomes. Imputed income, a major indicator of socioeconomic status is unsurprisingly related to mortality as it likely affects a number of unmeasured covariates that can be favorable to survival. Why no data for educational attainment? This is one of the most important SES predictors in the literature.

Commented [JD10]: What is the reasoning here…i.e. what underlying mechanism is this tapping into? A bit of a leap to attribute this directly to oral health.

An important limitation to this study was the availability of socioeconomic status variables collected as part of the adult sample questionnaire. Indicators of race-ethnicity, insurance status, and employment status would add pertinent information to estimate the socioeconomic status construct. The indicators used in the Cox proportional hazards model were recorded at the time of the survey and thus, do not account for any changes in overall socioeconomic status over time.

Commented [JD11]: I'm quite certain these variables are available in the NHIS.

This study benefitted from a large the sample size by combining across six years of NHIS data collection. NDI database linking is resourceful as this collection of data is comprehensive in

its assessment of mortality status from death records year after year. Future studies should focus on more expansive sets of predictors that try to capture the essence of socioeconomic status.

Both the introduction and discussion could use a lot more justification for this analysis and implications for overall research in this area. How is this type of analysis helping us to understand the mechanism linking SES and health beyond the many studies that have predicted mortality with SES variables previously? What is the value added to this approach? How does this support or contradict existing literature? As currently described the motivation and implications are not clear.

Table 1. Sample Adult Items Loadings

Variable	Affordability	Primary Care Access	Dental Visits
Gender	-0.173	**0.695**	0.124
Having usual care location	0.279	**0.763**	-0.071
Unable to afford in past 12 months			
Prescription medicines	**0.920**	-0.052	-0.107
Mental health care or counseling	**0.911**	0.005	-0.028
Dental care	**0.906**	0.064	-0.124
How long since last dental visit?	-0.146	-0.1	**0.954**
How long since last doctor visit?	0.037	**-0.736**	0.288

Table 2. Cox Proportional Hazards Regression Coefficients

Component	Hazard Ratio	Log HR	SE of Log HR	95% CI
Affordability	0.931	-0.072	0.013	(0.91 - 0.95)
Primary Care Access	0.884	-0.123	0.009	(0.87 - 0.90)
Dental Visits	1.138	0.129	0.007	(1.12 - 1.15)
Income	0.787	-0.239	0.011	(0.77 - 0.81)
Age (M=45, SE=0.1)	1.088	0.084	0.001	(1.09 - 1.09)

Commented [JD12]: Does this go in the opposite direction or is it coded differently?

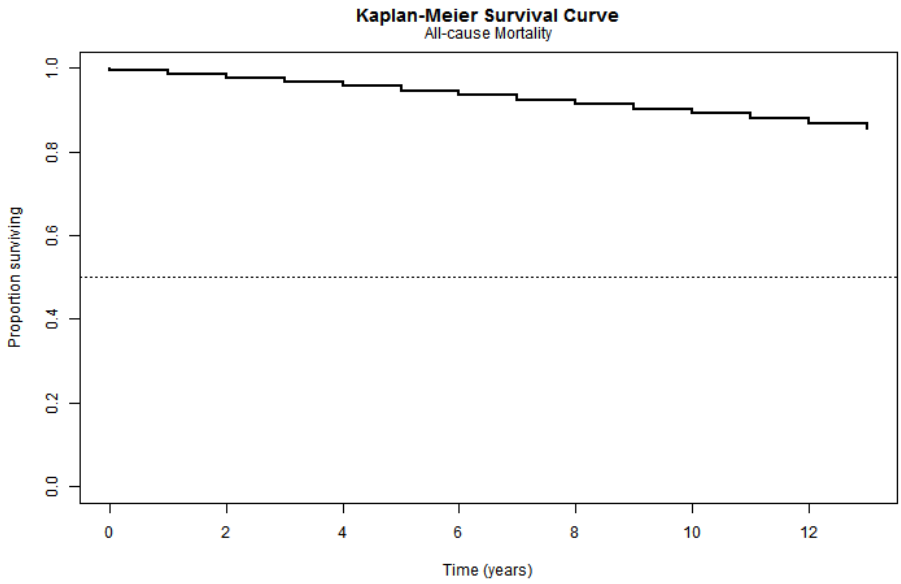

Figure 1. Kaplan-Meier Survival Curve for All-cause Mortality

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NEW YORK SHINES! (SHARING HEALTHY INFORMATION NECESSARY FOR EMPOWERING SOCIETY): A PILOT PROGRAM DESIGNED TO REDUCE THE EFFECT OF ACCULTURATION ON EXCESSIVE GESTATIONAL WEIGHT GAIN AMONG HISPANIC WOMEN

(6)

Components: 45
Abstract: 243
- Well organized, presentation was cohesive
- Refs: 30

(54)

by

[redacted]

A paper submitted in partial fulfillment
of the requirements for the Master's Degree in Public Health
at Lehman College, The City University of New York
2014

54/60

Department of Health Sciences
Master of Public Health Program
Lehman College
City University of New York

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Abstract (243 words)

Objective: To develop a supplemental Woman Infants and Children (WIC) prenatal program pilot for foreign-born Hispanic women within a New York City Health and Hospitals Corporation (HHC) center to reduce excessive gestational weight gain associated with increasing length of stay in the United States (U.S.).

Methods: The New York Sharing Healthy Information Necessary for Empowering Society (SHINES!) Program will recruit ten foreign born Hispanic mothers with a length of stay in the U.S. of at least 5 years. Participants must be less than 4 weeks of gestation as the program's launch in the Metropolitan Hospital Center WIC site. The program will meet once a month for 8 months between October 15th, 2015 and June 30th, 2016.

Results: Program activities will consist of four nutrition sessions that will focus on fundamental nutrition objectives while, educating participants on EGWG and the effects of acculturation on pregnancy. Three follow up meetings will provide one-on-one nutrition consultation with staff and a closing graduation ceremony to celebrate successful participant completion of program.

Conclusions: The program will aid in increasing participant understanding of potential negative influences of EGWG and urge the preservation of home-country diets among foreign-born Hispanics. New York SHINES! seeks to expand the supplemental nutrition program by implementing the program in all WIC sites located in New York City Health and Hospitals Corporation facilities serving high volumes of foreign-born Hispanics. The program encourages the national WIC program to modify current nutrition curriculum to target all foreign-born consumers.

Introduction

Excessive gestational weight gain (EGWG) is the occurrence of weight gained during pregnancy superseding recommendations set by the Institute of Medicine (IOM; Einerson, 2011). On average, a woman weight gain during pregnancy should not exceed 20 lbs if her pre-pregnancy BMI is >30 kg/m^2. Most prenatal weight gain occurs among women with a BMI >30 kg/m^2 (Einerson, 2011; Figure 1). Einerson found that 30 percent (%) of women within reproductive age (13 to 44 years of age) were classified as obese (Einerson, 2011). Excessive amounts of weight gained during pregnancy heighten maternal and infant risks of developing gestational diabetes, premature birth, abnormal birth weight, infant respiratory and neurological complications and caesarean sections (Einerson, 2011).

In a study of EGWG in Southern California, 30% of bilingual Hispanic women gained more weight than the IOM recommendations compared to 18.5% of Hispanic women who only spoke Spanish (Koleilat, 2013). The latter suggests that acculturation may be linked to EGWG among foreign-born mothers (Callister, 2002). In as little as five years, individuals incorporate less nutritional foods because of lack of nutrition education, linguistic isolation, neighborhood characteristics or income (Martinez, 2013). Less acculturated mothers are more likely to eat the host country foods as the length in the United States (U.S.) increases (Callister, 2002). For instance, Martinez found that as years in the U.S. increase, women are twice as likely to include foods with higher fat content including fast food and snacks and less likely to consume fruits and vegetables (Martinez, 2013).

To my knowledge, there are no current interventions specific to the excessive gestational weight gain among prenatal foreign-born Hispanic women living in the U.S. however, an intervention program called Viva Bien! addressed the influence of acculturation on effective self

management of diabetes among Latinas (Barrera, 2012). Upon the program's completion evaluators, assessed the effectiveness of cultural adapted diabetes prevention program for foreign born Hispanic women in which was originally intended for a Caucasian audience (Barrera, 2012). Viva Bien! succeeded at guiding participants in adjusting their lifestyle to reduce diabetes complications and the development of coronary heart disease. Over a period of 12 months, the attendance rates of the intervention ranged from 48% to 58%, a positive indicator of an effective program. Because of the intervention, participants suffering from Type II diabetes were able to decrease their hemoglobin Ac1 percentages and efficiently manage their blood sugar levels.

In recent years, New York City has experienced an influx of Hispanics migrating to the area. Program planners saw this group as ideal for a cultural based nutrition pilot seminar to encourage cultural preservation as length in the United States increases. In 2011, Latin countries represented the largest migration to New York City with 32% (City of New York, 2013). Thus, the objective of the project is to develop a supplemental Woman Infants and Children (WIC) prenatal program pilot for foreign-born Hispanic women within a New York City Health and Hospitals Corporation (HHC) center to reduce excessive gestational weight gain associated with increasing length of stay in the United States.

Methods

The New York Sharing Healthy Information Necessary for Empowering Society (SHINES!) Program will recruit ten Hispanic mothers born outside the United States with a length of stay of at least 5 years and within 4 weeks of gestation. The program will be launched at the Metropolitan Hospital Center WIC site located on the Upper Eastside of Manhattan. This program will take place within a high volume WIC location, East Harlem, where 80% of

participants are foreign-born Hispanic mothers. A WIC location is ideal because the staff have direct contact with members of the target community maximizing the level of impact. This program will be an enhanced extension of the current WIC appointments.

The Women Infants and Children program (WIC) is a forty-year-old nutrition entity that services prenatal and interconceptional (in between pregnancy) women with children up to 5 years of age (New York State Department of Health, 2014). WIC's mission encourages families to make smart nutritional choices while incorporating regular physical activity to reduce obesity in the United States (New York State Department of Health, 2014). Women who meet national Medicaid guidelines are eligible to partake in the program and receive WIC vouchers that are based on the mother's option to breastfeed (New York State Department of Health, 2014). The vouchers allow families to purchase WIC approved foods (milk, cereal, fruit, etc.) that are low in fat while, high in nutrients (New York State Department of Health, 2014). Through WIC, families will have access to nutritionists who will facilitate nutrition education and techniques (e.g. portion control). In addition, WIC provides breastfeeding peer counselors who assist in breastfeeding trouble shooting in an intimate setting (New York State Department of Health, 2014). New York SHINES! will supplement the existing WIC program by including items of ethnic and cultural identity to fortify the impact of the longstanding program's mission to reduce obesity, malnutrition and food insecurity among low-income households.

During recruitment, thirty women will be screened for eligibility, compliance or interest in the program (Figure 2). Upon receiving medical clearance from the participant's primary care physician, assigned members of the WIC staff will attempt to invite eligible mothers to participate in the program via telephone. A formal invitation that will reiterate program logistics (date, location and time) indicated during the phone call will be mailed to the addresses stored in

WIC electronic database (WICSIS). Participants will meet once a month for 8 months between October 15th, 2015 and June 30th, 2016. Mothers will be engaged during their one-on-one WIC nutrition consultation. Prospective participants will be asked to complete a brief questionnaire (Appendix 1) in which would serve as a screening tool. The questionnaire will require potential participants to disclose details such as birth country, time in U.S. and current weight. The information derived from the questionnaire will provide the tools needed to tailor the delivery of content thus, increasing the effectiveness of the intervention.

Selected participants will be engaged during 8 months in a nutrition education program comprised of 8 sessions centering on preserving traditional food and diet while incorporating weight management as it relates to the prevalence of gestational obesity as a mother's years in the United States increase. The staff/facilitators for the SHINES! program will utilize WIC personnel and will consist of two registered dietitians responsible for health education and support group monitoring, three nutritionist assistants responsible for maintaining participant records and two community health workers from the hospital's community outreach division. The community health workers will be available after each session to conduct case management for any participant who will need referrals/information for services such as temporary Medicaid, or immigration.

Results

The nutrition education curriculum will be as followed: Session 1 "Prenatal Weight-Gain and the Effect on Your Baby", Session 2 "Health & Heritage: A Guide to Preserving the Diet from Your Home Country", Session 3 "Mantener las Papas! - To Hold or to Keep the Potatoes!" A Guide to Portion Control & Favorite Traditional Foods", Session 4 "Navigating the

Supermarket: How to Pick the Best Produce & Where to Find Food Brands from Your Home-Country". Sessions 5-7 will be designated for follow up meetings where mothers can have one-on-one weight management consultation. Lastly, Session 8 will serve as a program wrap up and graduation (Figure 3). Sessions will be scheduled the first Wednesday of every month for 1.5 hours from 12 pm-1:30 pm. The desired total of participants for the program will be ten women who are currently enrolled in the hospital's WIC program. The 8 month series will occur separately from the regularly scheduled WIC health education classes. Roundtrip metro cards will be provided to the mothers for every session to alleviate travel expenses.

The program orientation will occur one hour before the official start of the nutrition curriculum activities. During this time, mothers will be acquainted with the New York-SHINES! staff and other program's participants. The group at large will be participating in icebreaker activities including the thumb-ball question and answer activity to set the tone for the duration of the program. The questions will range from favorite colors and foods to what prompts the moms to smile.

Concurrently with the icebreaker portion of the orientation, a WIC registered dietician provides the mother with an overview of the program and its intensions for providing her an opportunity to live a healthy life thus setting the foundation for her baby's healthy start. A consent form will be provided to solidify the mother's understanding of her involvement and acknowledgement that she may withdraw from the program at any point in time. Once all the participants complete their first SHINES! consultation, facilitators will administer a brief pretest that will consist of 4 questions (Appendix 2) on healthy eating and the effects of prenatal weight gain to measure the mother's level of understanding surrounding the matter of diet and nutrition.

Session 1 "Prenatal Weight-gain and the Effect on Your Baby" will address the exact effects of obesity during pregnancy, and the possible effects on both the mother (gestational diabetes) and infant's health (adult obesity, adverse birth outcomes). Nutritionists will dispel myths about "eating for two" and will suggest healthy snacks to satisfy cravings using WIC approved foods. The curriculum calls for addressing the IOM pregnancy weight gain recommendation guidelines (figure 1). The mothers will learn how their pre-pregnancy weight will determine the increments in which she can gain during pregnancy.

Session 2 "Health & Heritage: A Guide to Preserving the Diet from Your Home Country" will consist of educating the mothers on the significance behind continuing culinary traditions here in America. The mothers are provided with the opportunity to connect the preservation of family recipes and their quality of life. The session will begin by asking participants to share their favorite meals from back home and if they brought the recipes to America. Facilitators will discuss the science behind acculturation and its effect on health. Participants will learn what acculturation may mean for both her and her infant.

Session 3 "Mantener las Papas! - To Hold or to Keep the Potatoes?" A Guide to Portion Control & Favorite Traditional Foods" will encompass the significance behind portion control and traditional dishes. The SHINES! staff will educate participants on the importance of portion control using the "Choose My Plate" campaign recommendations (figure 4). In some cultures, carbohydrates and starches (e.g. potatoes, rice) are key components of meals. This session will call for participants to look closely at the food groups presented on their plates and the amount. The mothers will learn that although they may opt to continue their culinary traditions from their home countries portion control habits remain crucial in body functioning and weight management. The portion control topic will segue into a deep discussion of how an

overindulgence of processed foods and snacks containing high levels of sodium and saturated fat can lead to high blood pressure, high cholesterol and other negative health effects.

Session 4 "Navigating the Supermarket: How to Pick the Best Produce & Where to find Food Brands from Your Home-Country" will incorporate the use of WIC checks, Supplemental Nutrition Assistance Program (SNAP) vouchers and navigating around the supermarket. The first half of the session will take place at an Associated Supermarket within walking distance of Metropolitan Hospital. All foods acquired by SHINES! Participants have met nutritional standards for promoting optimal health for families. Here is where participants will be exposed to not only WIC approved foods but the availability of cultural product options. This session will provide the mothers with the tools to become privy to the set-up of the supermarket that draws attention to non-nutritious foods not conducive to reducing morbidity and mortality. Some of the supermarket tips would include understanding that junk food items commonly are highly visible at the beginning and end of every aisle. During the second portion of the session, the mother will participate in a discussion with program facilitators on where to find common brands from their countries of origin. Program staff will use a flip chart to write down vendor details. Following the session participants will receive handouts of local retailers that stock foreign brands vital to creating traditional dishes.

Sessions 5-7 will consist of follow up meetings with the New York SHINES! staff where mothers can individually meet to discuss her progress on making healthier food choices, preserving cultural diets from the home country and maintaining a healthy prenatal weight. Participants are encouraged to partake in a support group to discuss and share how they are integrating the information obtained during the nutrition instruction into their dietary practice. It

is important to note that for graduation each participant must attend at least one of the follow up meetings.

Session 8 will serve as a graduation and baby shower. The first 30 minutes will consist of staff administering a post-test (appendix 2) to measure increases in knowledge on excessive gestational weight gain upon program completion. The mothers will be informed of the amount of weight gained and loss during the program. Following the post-test will be a 30-minute discussion on their experiences while in the program. During this time program staff will encourage participants to share how they have incorporated lessons learned into their everyday lives. Metropolitan Hospital's auditorium will be adorned with flowers and other décor to celebrate the participant's completion of the program. The mothers will be able to invite a guest to share their special moment. As each participant is called, she will receive a certificate of completion.

Immediately following the 30 min graduation will be the baby shower with a lunch and traditional baby shower gifts. Because by the 8th month mark many mothers will be nearing their expected date of delivery, the program will provide strollers with detachable car seats as a gift. During the baby shower, the moms will learn that they will also be receiving cribs. Participants will have the crib delivered to a preferred address.

Results from the pre and post-tests will assess the effectiveness of the program and, any behavioral changes among the target population.

Conclusions/Discussion

New York SHINES! is designed to recognize the significance of preserving the cultural diets of Hispanic women born outside of the United States to reduce excessive weight

gain during pregnancy. As an extension of Women, Infants and Children program New York SHINES! will use culturally modified nutrition curriculum to ensure the healthy start of future Americans. Through its program objectives, New York SHINES! will decrease the frequency of infant morbidity including: abnormal birth weights, neurological and respiratory complications, premature birth and cesarean sections. The program will aid in increasing participant understanding of potential negative influences of EGWG during pregnancy and post-delivery through a series of nutrition education modules that will dispel myths such as "eating for two". Participants will be encouraged to continue to prepare traditional foods while actively preventing prenatal obesity. Introducing simple nutrition practices such as portion control, participants become champions in their own health.

New York SHINES! will foster a series of supportive of networks within WIC staff and among other participants. Such relationships will provide a safety net for foreign-born women who may reside in the U. S. alone or are unmarried. Through the cultivation of such alliances, participants will obtain accountability partners that will buffer the impact of acculturation. New York SHINES! operates as a resource for families to find solutions to obstacles that can potentially deter optimal health. In addition to connecting participants to entities like SNAP and emergency Medicaid enrollments New York SHINES! assist in culinary tradition preservation by identifying local retail sources that carry foreign brands. In 2014 nearly 40% (80 million) of the American public was categorized as obese (Ogden, 2014). New York SHINES! hopes to add a modern twist to the nation's ever changing demographics to continue to fortify the mission, visions and goals of WIC and similar programs.

A small sample size of ten (10) participants and the use of a single WIC location are limitations for the New York SHINES program. This culturally tailored nutrition program catered to prenatal foreign-born Hispanic women is not generalizable throughout other New York City Hispanic neighborhoods. For purposes of replicating New York SHINES! program planners would be careless to assume that all Hispanic subgroups share the same cultural customs. In the same respect program planners cannot presume that the social and economic determinants related to health presented with a Mexican population is the same determinants found within Dominican or Guatemalan communities. Such a small sample size will unsuccessfully represent the cultural variations among the targeted population. To encompass the array of countries represented within New York City extensive cultural research is crucial for program tailoring. Expanding New York SHINES! to other WIC locations with high volumes of foreign born Hispanic women will require program planners to study the cultural customs of targeted communities with the intention of creating appropriate curriculum.

The use of a WIC department that employs supremely educated nutrition staff members whom already developed a rapport with prospective participants is a strength of New York SHINES! The established WIC program at Metropolitan Hospital serving as the foundation for New York SHINES! provided a wealth of expertise on the subject of nutrition and the characteristics of the surrounding community. Knowledge of the community's characteristics were included in any cultural research conducted. The WIC program was ideal for program outreach and retention efforts because a captive audience was readily available. This additional benefit made participant recruitment much simpler. Nutritionists in whom they have developed relationships thus alleviating anxieties about participating in the program recruited mothers. Published reports specified that new Americans viewed the assortment of health educators as

"experts" in their field. (Patil, 2009). As result, foreign-born individuals are more likely to be receptive to public health messaging that will encourage behavioral adjustments for optimal health (Patil, 2009). Lastly, the nutrition education curriculum used for the 8 month program was derived from an existing WIC curriculum, with modifications to include items ethnic identity.

Recommendations

Based on the activities of this program the following recommendations are proposed:

- Expand the supplemental nutrition program by implementing the program in all WIC sites located in New York City Health and Hospitals Corporation facilities serving high volumes of foreign-born Hispanics.
- Enhance nutrition curriculums to incorporate items of ethnic and cultural identity to fortify the impact of the program's mission to reduce the risk of malnutrition, obesity and food insecurity amongst low-income households.

Public Health and Policy Implications

Encourage the national WIC program to modify current nutrition curriculum to target all foreign-born consumers of the program and strengthen the program's impact of reducing adverse effects of malnutrition and food insecurity. The forty-year-old entity will consistently adjust its nutrition education curriculum to reflect evolving demographic trends in United States. This action will assist the national program in strengthening obesity prevention during pregnancy by acknowledging the diversity that exists within their clientele.

The presence of New York SHINES! will create awareness of supportive services within the community such as the WIC theough referrals for care coordination to serve as solutions to

obstacles that may deter families from maintaining cultural identity as length of stay in the United States increases. New York SHINES essentially, a specialized WIC nutrition component exposes participants to resources to solve multiple social economic issues (i.e. food insecurity) through its program activities. Upon graduation, participants will have knowledge of processes such as food stamp enrollment in addition to where to purchase favored food brands from their home countries. Cohorts of the New York SHINES program have the opportunity to build social support networks among themselves. Members of the cohorts who were exposed to the same dosage of nutrition education can help each other maintain the principles and behavior modifications promoted during the 8th month program well after it concludes.

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Tables, graphs & Figures

Figure 1.

Recommended Total Gestational Weight Gain (Pounds), by Pre-Pregnancy Weight,* Institute of Medicine, 2009

Pre-pregnancy Weight*	Inadequate	Adequate	Excessive
Normal Weight	<25	25-35	>35
Obese	<11	11-20	>20

Underweight is defined as having a Body Mass Index (BMI) of less than 18.5; Normal Weight is defined as having a BMI between 18.5 and 24.9; Overweight is defined as having a BMI between 25.0 and 29.9; Obesity is defined as having a BMI of 30.0 or more; recommendations for total weight gain apply to women delivering singleton infants at term (37+ weeks' gestation).

Source: Adapted from Rasmussen KM, Yaktine AL, Institute of Medicine, Committee to Reexamine IOM Pregnancy Weight Guidelines. Weight gain during pregnancy: reexamining the guidelines. Washington, DC: National Academies Press; 2009.

Figure 2

Women, Infants and Children (WIC) Presents:

New York *SHINES!*

Sharing Healthy Information Necessary for Empowering Society



Eligibility

Are you Latina?
Are you Pregnant?
Have you lived in the United States for at least 5 years?

If so join us in the fun!



Nutrition Classes
Healthy Latin Inspired Food Demos
Prenatal Weight Management
Prenatal Yoga
Prenatal Belly dance
Come talk with other moms about adjusting to life in America

If you are interested, please contact
The Eastside WIC at Metropolitan Hospital
212-423-7395

Figure 3

Program Activity Modules

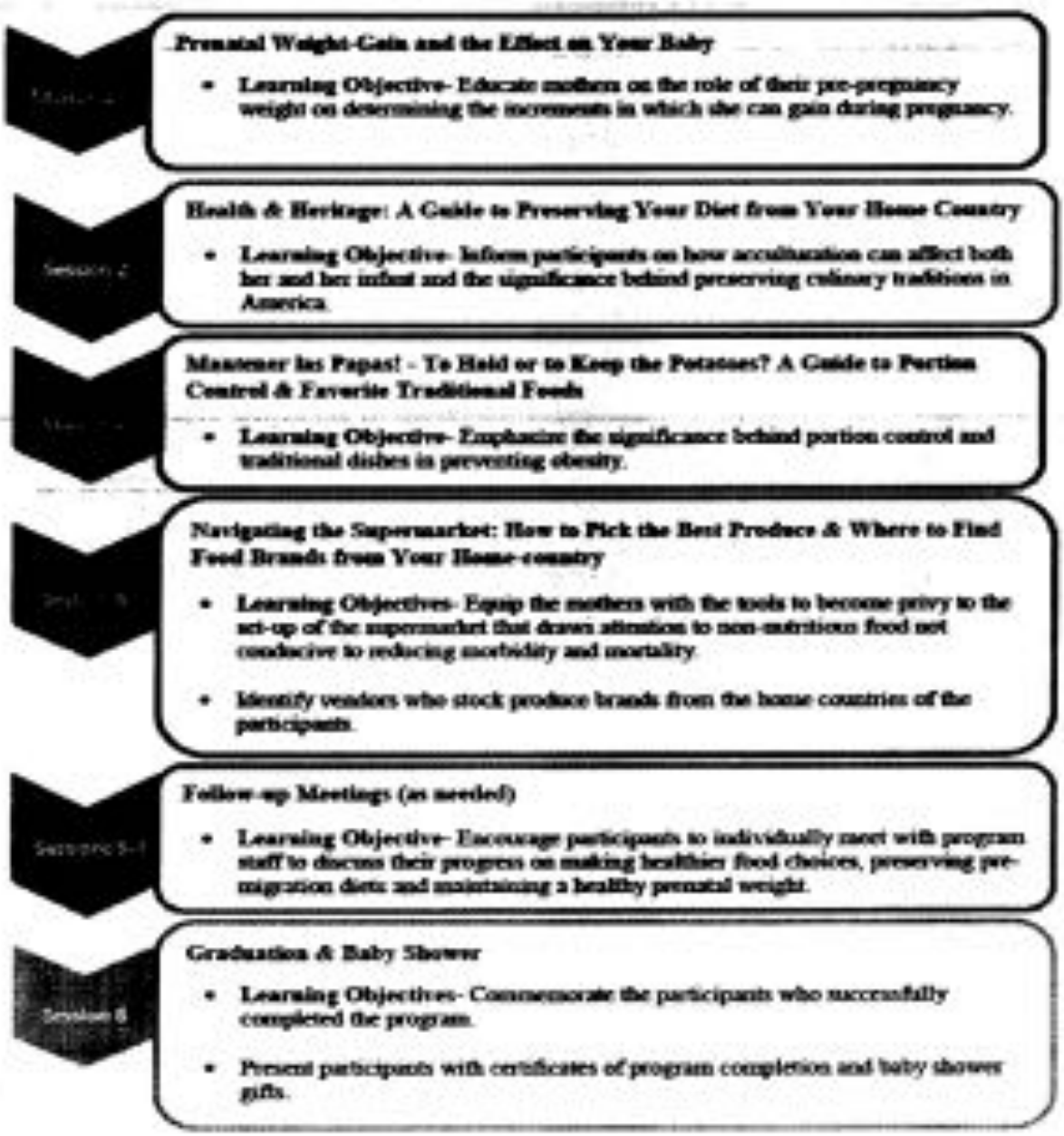
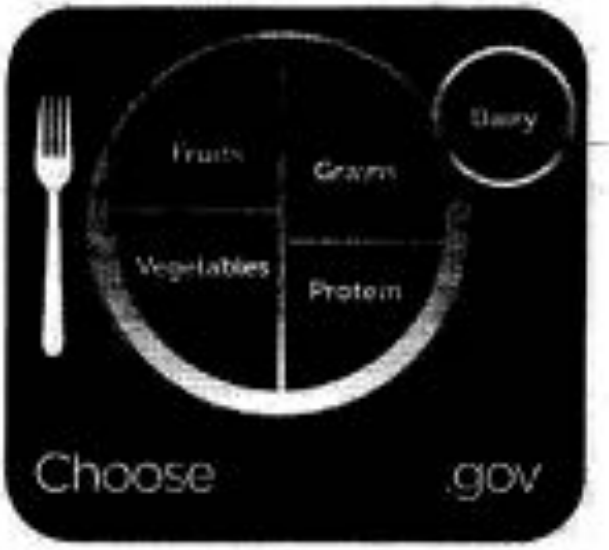


Figure 6



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Appendix 1

New York SHINES! Program

Participant Questionnaire

What is your age range? (Please circle all that apply)

18-24 25-30 35-40 40+

What is your birth country?

_____

What language do you feel most comfortable in? (Please circle all that apply)

English Spanish Cultural Dialect

How tall are you? _____ **How much do you weigh?** _____

When is your due date? _____

What are your top three favorite traditional dishes to cook?

1. _____
2. _____
3. _____

In what ways are you active? (Please circle all that apply)

Walking Jogging Dancing No activity

Do you live alone in the country? (Please circle all that apply)

Yes No

Would you like more support from women in your community to feel more comfortable in America? Please explain why.

Yes Explanation: _____

No Explanation: _____

In getting ready for your baby, do you have the means to get a stroller/car seat and a crib?

Yes No

Appendix 2

Prenatal Obesity Pre-Test

Name: _____ Date: _____

1. What is obesity?

___ High blood sugar ___ the inability to sleep

___ weighing more than recommended weight ___ weighing less than recommended weight

2. What are the causes of Obesity? (Check all that apply)

____Eating high calorie foods ____ drinking more juice than water

____ Lack of sleep ____ Stress

_____ Lack of exercise ____ Lack of money

3. What can obesity during pregnancy do to your baby? (Check all that apply)

____ Earlier delivery ____ Low birth weight

____ Underdeveloped organs ____ less chances for breastfeeding

1. True or False: As long as I am eating my traditional dishes from home, I can eat large portions of it because it is healthier than junk food?

____ True _____False

Prenatal Obesity Post-Test

Name: _____ Date: _____

4. What is obesity?

___ High blood sugar ___ the inability to sleep

___ weighing more than recommended weight ___ weighing less than recommended weight

5. What are the causes of Obesity? (Check all that apply)

____Eating high calorie foods ____ drinking more juice than water

____ Lack of sleep ____Stress

_____ Lack of exercise ____ Lack of money

6. What can obesity during pregnancy do to your baby? (Check all that apply)

____ Earlier delivery ____ Low birth weight

____ Underdeveloped organs ____ less chances for breastfeeding

2. True or False: As long as I am eating my traditional dishes from home, I can eat large portions of it because it is healthier than junk food?

____ True _____False

EVALUATING CULTURAL BELIEFS REGARDING HEALTH AND ILLNESS FOR NURSING STAFF

by

[redacted]

A paper submitted in partial fulfillment
of the requirements for the Master's Degree in Public Health
at Lehman College, The City University of New York
2014

Department of Health Sciences
Master of Public Health Program
Lehman College
City University of New York

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Abstract

Objective: To develop a questionnaire to assess the knowledge, skills, attitude, and awareness among nursing regarding cultural competence staff at Jacobi Medical Center from January 2nd through May 1st 2014.

Methods: Information on cultural practices and beliefs for the top six patient populations treated at Jacobi Medical Center was obtained from PubMed and anthropological textbooks. This information was used to develop a one-hour PowerPoint presentation. A pre-post questionnaire was developed using some questions adapted from the Clinical Cultural Competence Questionnaire including information on demographic, knowledge, skills, attitude, and awareness of cultural competency. This questionnaire will be given to participants before and after the PowerPoint presentation to assess their cultural competence.

Results: The questionnaire consists of 19 questions, ten out of the 19 questions were adapted from the Clinical Cultural Competence Questionnaire. It focuses on demographics, level of cultural competence, self- graded attitude, skills, knowledge toward socio-cultural issues as well as awareness of one's own identity, stereotype, prejudice, and bias. The questionnaire will assess nursing staff's cultural competence regarding knowledge, skills, attitude, and awareness of racial/ethnic minority patients' needs.

Conclusions: The questionnaire will be an important instrument to identify the strengths and weaknesses on cultural competence among nursing staff and to target specific domain for cultural competence intervention. It can be used for periodic assessment to track and monitor the level of cultural competence over time. Development of an instrument to measure patient's outcomes as a result of having cultural competence nursing staff should be the focus for future study.

Introduction

The United States (U.S.) has a diverse racial/ethnic population with over one third of the population (35.6%) identifying with racial/ethnic minority groups (U.S. Census Bureau 2013). In fact, minorities are projected to comprise 57% of the U.S. population by 2060 (U.S. Census Bureau 2012). Racial/ethnic diversity is pronouncedly observed in New York City (over 66% of the population belongs to racial/ethnic minority groups; U.S. Census Bureau 2010) and the Bronx (racial/ethnic minority groups represent over 90% of the population; U.S. Census Bureau 2013). As the U.S. population becomes more diverse, health care providers will see more patients presenting with different perspectives and beliefs related to health (Betancourt, Green, Carrillo, Park 2005). These differences may influence patients' adherence to their health care providers' recommendations (Berger 1998). To provide quality care to the growing racial/ethnic minorities, it is critical for health care providers to be cultural competent.

The cultural conflict between health care providers and racial/ethnic minority patients has resulted in a lower quality of care for minority population as compared to white Americans (Reynolds 2004), even when controlling for insurance affordability and financial stability (Institute of Medicine 2002). When health care providers possess the knowledge about their patients' racial/ethnic backgrounds, a better quality of care is likely to be provided (Stewart 1995). Research has shown that when there is a concordant physician-patient relationship, especially for minorities, there is a higher report of patient satisfaction, more adherence to medical recommendations, and better quality of care (Saha, Komaromy, Koepsell, Bindman 1999). Hence, cultural competence is important for clinicians to make proper diagnosis, to improve patient's adherence to medical treatment, and to have better health outcomes (Juckett 2005).

Recognizing the cultural competence of health care providers as one of the major factors to prevent and reduce racial/ethnic health disparities, the Institute of Medicine (IOM) had recommended cultural competence training for health care providers, focusing on their knowledge, skills, and attitudes toward treating racial/ethnic minority patients (Institute of Medicine 2002). As a requirement for medical school accreditation, cultural competence education is required as part of the medical school curriculum (Betancourt, Green, Carrillo, Park 2005). Some State Board of Medical Examiners, such as the ones from New Jersey, California, Connecticut, Washington, and New Mexico, require cultural competence training as part of the continuing medical education (Like 2011). The latter is necessary to provide quality of care for diverse racial/ethnic populations. In fact, there is strong evidence that cultural competence training has positive impact on health care providers' knowledge, skills, and attitudes toward racial/ethnic minorities' health needs (Beach et al., 2005).

Registered nurses, as first responders among health care providers, represent the largest portion (over 3 millions) of the U.S. health care professional workforce (U.S. Department of Health and Human Services 2010). They are the eyes and ears of the medical team in which they treat, report, and document racial/ethnic minority patients' interaction and feedback (Euromed Info 2014). However, according to the 2008 National Sample Survey of Registered Nurses, racial/ethnic minority registered nurses are underrepresented making up only 16.8% of the total registered nurse population (U.S. Department of Health and Human Services 2010). It is important for registered nurses to be cultural competent because they would have the first encounter with patients, do initial examination, and spend time, more than any physicians, in taking care of racial/ethnic minority patients when they admitted into the hospital. Therefore, this study aims to develop a questionnaire to assess the knowledge, skills, attitude, and

awareness among nursing regarding cultural competence staff at Jacobi Medical Center from January 2nd through May 1st 2014.

Methods

I conducted a literature search to inquire about the cultural competence of health care providers toward racial/ethnic minorities. Information on cultural practices and beliefs for the top six patient populations (African-American, Hispanic/Latino, Asian, Middle Easterner, Anglo-American, and South Asian) treated at Jacobi Medical Center was obtained from the PubMed database and anthropological textbooks. Using the following terms "cultural competency", "health care", "system", "racial/ethnic disparities" and "United States" combined, the search resulted in 44 articles. When applying the inclusion criteria such as journal articles published in English, free full text, and between 01/01/2003 to 9/31/2014, the search resulted in 15 journal articles. The information from these articles provides background knowledge related to cultural competency. In addition, information on cultural competence of interested racial/ethnic minority groups was gathered from anthropological textbooks (Rankin, Stallings 1996; Galanti 2004) and used to develop a one-hour PowerPoint presentation.

The PowerPoint presentation covered the following domains: defining cultural competency, barriers to cultural competency, model of care, model of disease and its etiology, cultural differences focusing on the population of interest, patient education, and strategies to work with patients in cross-cultural settings (Betancourt, Green, Carrillo, Ananeh-FirempongII 2003; Galanti 2004; Juckett 2005; Loftin, Hartin, Branson, Reyes 2013; Vaughn, Jacquez, Baker 2009). Handouts containing key topics addressed in the presentation were also developed for participants to take home (Rankin, Stallings 1996; Galanti 2004; See Appendix A). The

objectives of this presentation were that, upon completion of the presentation, learners will be able to: 1) improve cultural awareness, knowledge, and skills on treating racial/ethnic minority patients; 2) be more understandable, respectful, and tolerable to cultural differences; and 3) provide positive and meaningful interactions with patients and their families.

Based on the content covered in the PowerPoint presentation, a pre-post questionnaire was developed. Some questions for the survey were adapted from the Clinical Cultural Competency Questionnaire (Like 2001; http://www.rwjms.rutgers.edu/departments_institutes/family_medicine/chfod/grants_projects/documents/pretraining.pdf).

Results

The domains for the questionnaire were demographics, level of cultural competence, and self- graded attitude, skills, and knowledge toward socio-cultural issues as well as awareness of one's own identity, stereotype, prejudice, and bias. It was designed after the development of the slides for the PowerPoint presentation and was based on the contents of the presentation. Each questionnaire survey coded with an ID number, time, and date.

The questionnaire began with a purpose statement indicating that it was designed to assess participants' current experiences with cultural competency. It informed participants that their participation is voluntary and asked them to answer the questions to the best of their ability.

There were three sections in the questionnaire: Section I had five questions asking for demographic information including gender (male and female), age group (<25, 25-34, 35-44, 45-54, 55-64, >=65), self-identified race/ethnicity (White, Asian, African-American/Black,

Hispanic/Latino), country of origin (U.S., Puerto Rico, other U.S. territories), and years of experience in the health care system (<=5, 6-10, >10; see Appendix B).

Section II was used as the pre-questionnaire having six questions. Question 1 asked for the level of cultural competence (80-100%, 50-79%, or less than 50%) of the participants. Questions 2 through 6 were adapted from the Clinical Cultural Competence Questionnaire (Like 2001): Question 2 asked participants to grade their attitude or belief about the importance of socio-cultural issues in their interactions among patients, health professional peers, and staff. Question 3 asked participants about their feeling in dealing with cross-cultural encounters, such as caring for patients with diverse backgrounds and interpreting different cultural expressions of pain, distress and suffering. Question 4 asked participants to grade their knowledge about the socio-cultural characteristics, risk of disease, health disparities, different healing traditions, and experience of racism in health care among diverse racial/ethnic minority groups in the United States. Question 5 asked participants to grade their skill when dealing with socio-cultural issues in patient care, such as greeting patients, performing a physical examination, and providing patient education or counseling on a culturally sensitive manner, and eliciting patient's perspective about health and illness, folk remedies, and other healing modalities. Question 6 asked participants to grade their awareness of their own cultural identity, stereotype, bias, and prejudice. Questions 2 through 6 had five choices to respond using a Likert scale (0-4), including not at all (0), a little (1), somewhat (2), quite a bit (3), and very (4).

Participants were asked to complete Sections I and II of the questionnaire before attending the one-hour PowerPoint presentation on cultural competency. At the end of the presentation, participants were asked to complete section III.

Section III was used as the post-questionnaire with eight questions: Questions 1 through 6 were the same as in section II with the same way for the responses; question 7 and 8 were open-ended questions asking participants to identify some barriers to cultural competence at their work place and to comment on the strengths and weaknesses of the presentation.

The questionnaires were collected when participants leave the auditorium. A pre- and post-method of evaluation would be employed to address the pre- and post knowledge, skills, attitude, and awareness after the PowerPoint presentation. The information obtained in the pre-post questionnaires would be compared using the statistical software. The difference in the responses for questions 1 through 6 between section II and III would use to assess a measurable change in knowledge, skills, attitude, and awareness of cultural competence among nursing staff as a result of attending the presentation. A pilot testing of the questionnaire was conducted among 25 nurses at Jacobi Medical Center on May 1st 2014. All participants understood the questions and had no problem completing the questionnaire.

Conclusions/Discussion

The questionnaire was designed to assess the knowledge, skills, attitude, and awareness of nursing staff at Jacobi Medical Center with regards to cultural competency. This 19-question questionnaire had five domains that would be a valuable tool to determine the needs for additional educational training among nursing staff regarding cultural competency. This questionnaire could be an important instrument because it identified the weaknesses and strengths in cultural competence among nursing staff and targeted specific domain for cultural intervention.

When caring for diverse patient population, nursing staff need to educate about cultural competence by incorporating the slide presentation and the questionnaire into their educational training (Loftin, Hartin, Branson, Reyes 2013). Studies had shown that cultural competence training impacts nurses' and physicians' knowledge, attitudes, skills, and behaviors on treating racial/ethnic minority patients (Beach et al., 2005). In fact, ongoing cultural competence educational training and periodic assessment were recommended to ensure that nurses and physicians are up-to-date with cultural competence (Campinha-Bacote 2002).

A systemic review of nurses and physicians on cultural competence educational interventions by Beach et al. (2005) indicated that there is positive effect associated with whether the education on cultural competence is long or short duration, experiential or nonexperiential, and focusing on general or specific cultural information. The content of these cultural competence interventions focused on: 1) specific racial/ethnic minority groups' cultures (African-American, American Indian, Asian/Pacific Islander, Latino); 2) general cultural concepts (such as how culture impacts patient-doctor/nurse encounter; Tang et al. 2002); 3) how doctor/nurse's lack of knowledge of cultural norms and practices can adversely impact treating racial/ethnic minority patients (Rubenstein et al. 1992); 4) specific knowledge of traditional cultural practices regarding disease burdens on certain populations (Flavin 1997;Nora et al. 1994); and 5) attitudes toward treating health issues on the racial/ethnic community as well as showing interest in learning patient's background (Way et al. 2002). The methods of delivering these cultural competence interventions included lectures, group discussion, case scenarios, and audio/visual presentations, with contact time ranging from less than 8 hours to greater than one week. The overall outcome of these cultural competence interventions indicated a positive effect on nurses' and physicians' knowledge, skills, and attitude toward treating racial/ethnic patients

(Beach et al. 2005). Therefore, a one-hour PowerPoint presentation on cultural competence may assess the knowledge, skills, attitudes and awareness of nursing staff and may provide the foundation for a positive effect on nursing staff toward treating racial/ethnic minority patients.

The content of the pre-post questionnaire included questions about participants' level of cultural competence and participants' grading on their knowledge, skills, and attitude toward socio-cultural issues and cross-cultural encounters with patients, staff, and colleagues. It also asked participants to grade their awareness of their own cultural identity, stereotype, bias, and prejudice. Out of the 19 questions, ten questions were adapted from the Clinical Cultural Competency Questionnaire, which contains 56 validated and widely used questions (Like 2001). These questions were carefully selected to match with the content of the PowerPoint presentation.

There were strengths to the questionnaire and included: 1) the questions used in the survey were validated and reliable questions from the Clinical Cultural Competence Questionnaire (Like 2001); 2) the questionnaire was short containing 19 questions as compared to the 56 questions of the Clinical Cultural Competence Questionnaire (Like 2001). However, there were some limitations including: 1) because the questionnaire is self-reported, participants' responses may be bias; the questionnaire asks for participants' self-perception of cultural competence; nevertheless, participants might report what they considered as socially acceptable rather than as their perception (Capell et al. 2007; Kumas-Tan et al. 2007); and 2) this questionnaire was specifically designed to nurses in Jacobi Medical Center, a single NYC hospital, and therefore, it may not be used or generalized to other locations or all health care providers. However, nurses were the focus of this study because they represent the largest numbers (over 3 millions) of health care workforce, are first responder to encounter patients, and

are overrepresented (83.2%) by white/non-Hispanic (U.S. Department of Health and Human Services 2010). Jacobi Medical Center was chosen as the site for this study because it locates in northeast of the Bronx and its patients represent 90% of racial/ethnic minorities (Jacobi Medical Center 2013). This medical center has a national reputation in emergency medicine, trauma surgery, burn care, and neonatal care. In 2013, Jacobi Medical Center had 477 beds in service, 339,347 outpatient visits, 115,975 emergency room visits, and 21,669 discharges (Jacobi Medical Center 2014).

Recommendations

Although the development of the cultural competence training and the questionnaire are aimed to help increase nursing staff's knowledge, skills, attitude, and awareness toward treating racial/ethnic minority patients, there is additional works to be done to ensure achieving better health outcomes for minority patients and patients in general:

- To expand the use of the PowerPoint presentation and questionnaire not only to health care providers in general at Jacobi Medical Center but also to all NYC hospitals.
- To implement cultural competence training and assessment on nursing staff periodically to attain up-to-date cultural enrichment (Vaughn, Jacquez, Baker 2009).
- To mandate cultural competence not only to nurses but all health care staff as part of new hire orientation.
- To assess the level of cultural competence of hospital staff through patient satisfaction survey. Based on the patients' feedback, hospital administrators can determine whether having cultural competence staff will achieve better health outcomes for racial/ethnic minority patients or not. Hospital administrators can also use this feedback to reorganize their cultural competence

training and to learn and adopt specific cultural attitude to achieve more patients' satisfaction and better health outcomes.

Public Health and Policy Implications

As the U.S. population become more diverse, with the projection of minorities will comprise 57% of the U.S. population by 2060 (U.S. Census Bureau 2012), cultural competence training and periodic assessment for nursing staff are necessary to improve the health care services and health outcomes of racial/ethnic minority patient population. Studies have suggested that cultural competence training increases knowledge and skills of hospice staff, medical students, faculty and staff at Creighton University Medical Center in caring for racial/ethnic minority patients (Crosson et al. 2004; Schim, Doorenbos, Borse 2006; O'Brien et al. 2006). Other studies have suggested that patients who received cultural sensitive care from nurses and physicians report an increase in adherence to medical treatment plan and increase level of satisfaction with their nurses (Chenowethm et al. 2006; Cook, Omofolascade, Richard 2005). According to the national sample survey of registered nurses in 2010, there are over three million registered nurses, representing the largest portion of the U.S. health care workforce. However, the majority of these registered nurses (83.2%) are non-Hispanic whites and may be less likely to be cultural competent when treating racial/ethnic patients or minority patients may be less likely to develop a rapport and trust (U.S. Department of Health and Human Services 2010). Therefore, as the first responders and contact with racial/ethnic minority patients, registered nurses are the preferred group needing cultural competence training and assessment using the questionnaire as compared with other health care providers and staff.

Cultural competent trained nurses could improve population health by treating and serving racial/ethnic minority patients with cultural sensitive knowledge and skills; they can teach patients about disease, treatment options, and how to manage their medications, do exercises, change dressings, and participate in activities that promote independence and increase function. As a result of educating the patients, there will be an improvement in knowledge of disease and treatment plan, a better adherence to medical treatment, and a decrease in anxiety, symptoms, and readmission rates.

The questionnaire to assess cultural competence training can be implemented not only to nursing staff but also to other health care providers, health educators, and health administrators. By improving these healthcare stakeholders' knowledge and awareness toward cultural sensitivity of the growing racial/ethnic minority patient population, the attitude and culture of our health care system can be changed to accommodate the needs of minorities, such as interpreting service, and discussion of treatment plan and instructions for after care in their own language. This training can be integrated as part of hospital and/or CME education policy by requiring all personnel to attend an annual cultural competence training and assessment using the questionnaire. Attendees will gain enriched cultural development and will be equipped with cultural knowledge to better serve the diverse patient population and to achieve optimal health outcome.

The use of the PowerPoint presentation and questionnaire could be expanded to all New York City hospitals especially because the great racial/ethnic diversity New York City residents (U.S. Census Bureau 2010). Moreover, the PowerPoint presentation and questionnaire could be expanded to medical schools, nursing schools, and allied health schools because these institutions train and produce our health care providers. When everyone is knowledgeable about

others' cultural practices and beliefs, a better understanding, mutual respect, and satisfactory services can be accomplished in a diverse racial/ethnic community.

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Appendix A

Do and Don'ts of Providing Culturally Competent Care

Do

1. Do remember to ask the right questions of all your patients: the *4 Cs* of culture
   - What do you *call* your problem?
   - What do you think *caused* it?
   - What have you done to *cope* with it?
   - What *concerns* you about it?
2. What *concerns* do you have about my recommended treatment?
3. Do try to understand people's values, since they will influence their behavior.
4. Do realize that not all patients believe germs caused their disease. Again, ask them what they think caused their illness.
5. Do recognize that people with a present time orientation may have difficulty with preventive health care. Make an extra effort to explain the importance of preventive health care, and why it is necessary to continue medication even after the symptoms have disappeared.
6. Do try to allow a patient as many visitors as she or he would like to have.
7. Do distinguish the degree of self-care necessary for recovery from that which is merely an imposition of the value of independence.
8. Do include family members in the patient teaching, if a family member will be caring for a patient at home.
9. Do respect a woman's concern for modesty; try to keep her covered.
10. Do try to assign same-sex health care providers when possible, especially for Middle Eastern patients.
11. Do be sensitive to the fact that most African Americans have been subjected to racial prejudice and discrimination.
12. Do respect patient's religious beliefs; involve clergy in their care when appropriate.
13. Do learn about the beliefs and practices of the patient populations you serve.
14. Do keep in mind that there is always individual variation within a group.
15. Do develop a tolerant accepting attitude about views different from your own.

Don'ts

1. Don't stereotype people.
2. Don't judge a patient's level of pain based upon their expressiveness. Some cultures encourage expressiveness, others encourage stoicism.
3. Don't wait to offer pain medication until a patient asks for it; many Asian patients will suffer in silence.
4. Don't assume lack of eye contact indicates lack of interest, or guilt, or some other negative point. For Asians, it may be a way of showing respect; for Middle Easterners, a way of maintaining propriety.
5. Don't judge people as "pushy" or "cold" based upon how close they stand to you.
6. Don't expect that all patients will make their own decisions. In cultures where the family is primary unit, important decisions may be made by the family. In cultures where males are dominant, the husband may make the final decisions regarding the health care of their wife and children.
7. Don't offer ice water as the only liquid for Asians and Hispanics. Many will prefer room temperature or warm liquids.
8. Don't confuse traditional health care practices such as coining and cupping with abuse.
9. Don't assume that a patient's appetite is based solely on feelings of hunger; some foods prepared by the hospital may violate rules of body balance or religious prohibitions, or may simply be unfamiliar to the patient.
10. Don't assume the patient wants to be informed of a fatal diagnosis. Ask the patient upon admission (or before, if possible) to whom he or she would like information about his or her condition to be given. Often family members will want to shield patients from a terminal diagnosis.

Source: Galanti, Geri-Ann. *Caring for Patients from Different Cultures*. 4th ed. University of Pennsylvania Press. 2008. P.249-250.

Questions to Ask During a Cultural Assessment

1. What do you think has caused your problem?
2. Why do you think it started when it did?
3. How severe is your illness? Will it have a long or short course?
4. What kind of treatment do you think you should receive?
5. What are the most important results you hope to get from this treatment?
6. What are the chief problems your illness has caused for you?
7. What do you fear most about your illness?

Source: Rankin, S.H., Stallings, K.D. Patient Education: Issues, Principles, Practices, 3rd Ed. Philadelphia: Lippincott Raven. 1996; 69

Characteristics of Cultural Embeddings

1. How recently did the patient immigrate?
2. Was the immigration voluntary or involuntary?
3. Did the patient live in intermediate countries before coming to the United States?
4. What country did the patient immigrate from and how different is that culture from U.S. culture?
5. Who does the patient associate with?
6. What type of neighborhood does the patient live in?
7. Does the patient follow traditional dietary habits?
8. Does the patient wear native dress?
9. Does the patient leave his neighborhood to participate in the larger culture?
10. Does the patient use folk medicine or see the practices of a native healer?
11. Does the patient come from an urban or rural area in the native country?

Source: Rankin, S.H., Stallings, K.D. Patient Education: Issues, Principles, Practices, 3rd Ed. Philadelphia: Lippincott-Raven. 1996; 70-7

Appendix B

ID#_____ Time_____ Date_____

Pre-presentation Questionnaire Survey on Cultural Competency

The purpose of this survey is to assess your current experiences with cultural competency. Please answer the following questions to the best of your ability. Your participation in this study is voluntary. Your inputs are valuable to improve our program.

Section I

1) Which of the following age groups would you fit best?

A. <25 B. 25-34 C. 35-44 D. 45-54 E. 55-64 F. >=65

2) What is your gender? A. Male B. Female

3) Which of the following best describes you?

A. White B. Asian C. African American/Black D. Hispanic/Latino E. Other (specify): _____

4) Where were you born? A. U.S., Puerto Rico, or other U.S. territories B. Outside the U.S.

5) How many years of experience do you have with the health care system? A. <= 5 years B. 6-10 years C. More than 10 years

Section II

1) What would you say your level of cultural competence is? A. 80-100% B. 50-79% C. Less than 50%

2) How **IMPORTANT** do you believe socio-cultural issues are in your interactions with: (Please check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Patients?					
Health professional peers?					
Other staff?					

3) How **COMFORTABLE** do you feel in dealing with the following cross-cultural encounters or situations? (Please check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Caring for patients from culturally diverse backgrounds					
Being attentive to nonverbal cues or the use of culturally specific gestures that might have different meanings in different cultures					
Interpreting different cultural expressions of pain, distress, and suffering					
Advising a patient to change behaviors or practices related to cultural beliefs that impair one's health					

4) How **KNOWLEDGEABLE** are you about each of the following subject areas? (Please Check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Sociocultural characteristics of diverse racial and ethnic groups					
Risk of disease experienced by diverse racial and ethnic groups					
Health disparities experienced by diverse racial and ethnic groups					
Different Healing Traditions (e.g. Traditional Chinese Medicine)					
Historical and contemporary impact of racism, bias, prejudice and discrimination in health care experienced by various population groups in the United States					

5) How **SKILLED** are you in dealing with socio-cultural issues in the following areas of patient care? (Please check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Greeting patients in a culturally sensitive manner					
Eliciting the patient's perspective about health and illness (e.g., its etiology, name, treatment course, prognosis)					
Eliciting information about use of folk remedies and/or other alternative healing modalities					
Performing a culturally sensitive physical examination					
Providing culturally sensitive patient education and counseling					
Dealing with cross-cultural adherence/compliance problems					

6) How AWARE are you of your own: (Please check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Racial, ethnic, or cultural identity?					
Racial, ethnic, or cultural stereotypes?					
Biases and prejudices?					

Please do not proceed to section III until the presentation ends. Thank you!

Section III

Post-presentation Questionnaire Survey on Cultural Competency

1) What would you say your level of cultural competence is?
   A. 80-100%
   B. 50-79%
   C. Less than 50%

2) How **IMPORTANT** do you believe socio-cultural issues are in your interactions with: (Please check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Patients?					
Health professional peers?					
Other staff?					

3) How **COMFORTABLE** do you feel in dealing with the following cross-cultural encounters or situations? (Please check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Caring for patients from culturally diverse backgrounds					
Being attentive to nonverbal cues or the use of culturally specific gestures that might have different meanings in different cultures					
Interpreting different cultural expressions of pain, distress, and suffering					
Advising a patient to change behaviors or practices related to cultural beliefs that impair one's health					

4) How **KNOWLEDGEABLE** are you about each of the following subject areas? (Please Check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Sociocultural characteristics of diverse racial and ethnic groups					
Risk of disease experienced by diverse racial and ethnic groups					
Health disparities experienced by diverse racial and ethnic groups					
Different Healing Traditions (e.g. Traditional Chinese Medicine)					
Historical and contemporary impact of racism, bias, prejudice and discrimination in health care experienced by various population groups in the United States					

5) How **SKILLED** are you in dealing with socio-cultural issues in the following areas of patient care? (Please check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Greeting patients in a culturally sensitive manner					
Eliciting the patient's perspective about health and illness (e.g., its etiology, name, treatment course, prognosis)					
Eliciting information about use of folk remedies and/or other alternative healing modalities					
Performing a culturally sensitive physical examination					
Providing culturally sensitive patient education and counseling					
Dealing with cross-cultural adherence/compliance problems					

6) How **AWARE** are you of your own: (Please check one)*

	Not at all	A Little	Somewhat	Quite a Bit	Very
Racial, ethnic, or cultural identity?					
Racial, ethnic, or cultural stereotypes?					
Biases and prejudices?					

7) Can you identify some barriers to providing culturally competent care in your work place?

_____

_____

8) Please offer any comments with regard to the strengths and weaknesses of this presentation on addressing the topic.

_____

_____

Thank you very much for your time and efforts!

* "This survey has been adapted with permission from the Clinical Cultural Competency Questionnaire (CCCQ) developed by Robert C. Like, MD, MS, Professor and Director of the Center for Healthy Families and Cultural Diversity, Department of Family Medicine and Community Health, Rutgers Robert Wood Johnson Medical School. The CCCQ was used in a project entitled, "Assessing the Impact of Cultural Competency Training Using Participatory Quality Improvement Methods," funded by the Aetna Foundation (http://rwjms.rutgers.edu/departments_institutes/family_medicine/chfcd/grants_projects/aetna.html) Any results obtained in future projects making use of the CCCQ are solely the responsibility of project investigators and do not necessarily represent the official views of the Aetna Foundation or its affiliates."

Capstone Paper or Master's Essay Checklist

Student: [redacted] **Faculty reviewer: Spring Cooper** **Date: 10/5/15**

Title of Capstone research or practice paper: Maternal Tdap Vaccination During Pregnancy (Systematic LR)

Is this paper a Master's Essay? Yes X No ____

C = Completely S = Substantially P = Partially N = Not at all N/A = Not applicable

	C	S	P	N	N/A	Comments on Quality
1.Provided a **Structured Abstract** (≤250 words)	x					
2.Provided an accurate **Table of Contents**	x					
3.Provided an **Introductory** section including:	x					
*a. **Scope** of the problem and public health s**ignificance***	x					
*b. Summary of **relevant scientific knowledg**e and policies*	x					
*c. Identification of relevant **gaps in knowledge***	x					
*d. Clear **rationale** for the project*	x					
e. Summary of what will be covered in the paper (aims)	x					Clear; organized
f. Clear description of research conducted or project undertaken (and student's role in the process)						
4. Described the **Methods or Processes** including:						
a. Population, setting, sites and sample (if relevant)		x				
b. Description of information/data collection procedures and measures (qualitative or quantitative)or Process used to develop project	x					
c. Relevant data manipulation & analytic techniques used		x				
5. Presented **Results or Project Outcomes**, including:						
a. Description of sample characteristics, or description of process outcomes		x				I felt like a lot of the results was just listed summaries, directly from the tables. I would have liked more synthesis in the results section.
b. Descriptive information on relevant risk factors and outcomes , or on curriculum, intervention or policy components that were assessed, adopted or tested		x				

	C	S	P	N	N/A	Comments on Quality
c. Subgroup analysis, as appropriate					x	
d. Clearly labeled graphs and figures	x					Table 1 should have had date ranges included
e. Correctly used & interpreted measures and/or statistical tests		x				
6. Synthesized findings in a **Discussion Section**, including:						
a. Succinct synthesis of results	x					
b. Interpretation of results in context of literature		x				
c. Summary of strengths and limitations of project	x					
d. Recommendations based on study or project findings and a conclusion/take home message	x					Well done
7. Organized paper logically and in accordance with instructions, including:						
a. Correct length (3000-5000 words) and format (subheadings, margins, spacing)	x					
b. At least a minimum of 15 references, including ≥6 peer-reviewed sources	x					
c. Complete references, using AJPH format	x					
d. Proper attribution for all facts	x					
e. Correct spelling and grammar	x					
8. Organized paper in a clear and effective **style,** including:						
a. Ideas within & between paragraphs laid out in a clear & logical fashion	x					
b. Clear paper flow; readable		x				
c. Appropriate language for scientific writing		x				

Action to be taken, please check one:

x This paper is acceptable with no revisions.

Please comment on your reason for selecting the above choice:

Well done paper. No significant content revisions required. The paper focused on Tdap in pregnancy as a prevention method for protecting infants from pertussis before they are fully vaccinated. Because it was such a small body of literature, I would have recommended more comparison to the cocoon method and to include more data on pregnant women's acceptability of vaccination during pregnancy. However, for the defined project, it was well completed. I appreciated the international context being included.

Maternal Tdap Vaccination During Pregnancy as a Method of Protection Against Infant Pertussis: A Systematic Literature Review

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Abstract

Objectives

In 2012, the Advisory Committee on Immunization Practices (ACIP) recommended a Tdap vaccine booster during pregnancy as an effort to protect infants against pertussis. This systematic review seeks to address the effects of Tdap during pregnancy on both mother and child, assess whether there are any safety concerns associated with this practice, and evaluate trends in vaccine uptake to determine whether any challenges or barriers exist in the implementation of ACIP Tdap vaccination guidelines.

Methodology

Guided by PRISMA standards, a search was conducted using the online databases MEDLINE, ProQuest, PubMed, Science Direct, and the New York Academy of Medicine's grey literature collection. Peer-reviewed journal articles published between 2004 and 2015 were selected for review if they pertained to pregnancy dose Tdap vaccination as a source of protection for infants against pertussis.

Results

Fifteen articles were selected for review. Eight studies investigated the effects of receiving Tdap during pregnancy. Three studies completed assessments on the safety of receiving Tdap during pregnancy. Four studies investigated the trends in Tdap vaccine acceptance among pregnant women.

Conclusions

Evidence presented in this systematic literature review appears to support the ACIP's Tdap recommendation for pregnant women as a safe and effective method of providing protection against pertussis for infants too young to receive vaccination. Efforts to implement these guidelines should target health care professionals as sources of information for pregnant women. Future studies should investigate disparities in Tdap acceptance to determine whether cultural, geographical, or socioeconomic barriers exist.

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I. Introduction

Despite the widespread availability of vaccines and more than 60 years without a significant outbreak, pertussis- or "whooping cough"- has reemerged as a threat in the United States. Recent years have produced significant increases in pertussis cases, reaching status as epidemic in California in 2010 and again in 2014.[1] Though pertussis outbreaks tend to be cyclical, these increases have required public health officials to take action to reduce the burden of this disease, particularly for those who are unable to receive protection in the form of vaccinations.[2]

A. Epidemiology

Pertussis, caused by the bacterium *Bordetella pertussis,* is a contagious respiratory infection which may be transmitted from one person to another via coughing or sneezing in close contact.[3] It occurs in three stages: the catarrhal stage, the paroxysmal cough stage, and convalescence.[2] Within the first two weeks (the catarrhal stage) of pertussis, the infected individual displays runny nose, sneezing, a low fever, and an occasional cough which worsens as pertussis moves into the second stage for approximately one to six weeks.[2] In this paroxysmal cough stage, the individual experiences bursts of coughs which are followed by a high-pitched "whoop" caused by efforts to catch ones breath.[2] These episodes may lead to vomiting and exhaustion.[2] Recovery from infection and gradual decrease in coughing occurs in the convalescence stage, though this may take weeks or months depending on severity.[2]

Although rare, pertussis may be deadly due to severe complications in the form of pneumonia, seizures, or encephalopathy.[2] The introduction of pertussis vaccinations led to a gradual decrease in pertussis incidence, from approximately 175,000 cases per year in the early

1940's to less than 3,000 cases per year in the 1980's.[2] Since the 1980's, however, pertussis case numbers have continuously risen to the epidemic levels seen today.[2]

B. History of Pertussis in the United States

Surveillance efforts for pertussis cases began in 1922, in which 107,473 cases were reported in the United States.[4] Reported cases grew to an all-time high of 265,269 cases in 1934 before decreasing significantly as the first pertussis vaccine was introduced in the 1940's.[4] Following this introduction of the pertussis vaccine known as DTP (diphtheria, tetanus, and pertussis), pertussis cases declined significantly to rates below 10,000 cases per year by 1965.[4] These low rates continued until 2003 when reported cases rose to 11,651, followed by continual increases reaching approximately 48,277 pertussis cases in 2012.[4] Pertussis events tend to be cyclical, peaking every two-to-five years (explanations for the cyclic nature of pertussis were not found),[5] though recent numbers have been significant for pertussis cases in the United States. Theories on the recent surges in pertussis cases are varied and include decreases in vaccination rates as well as speculated decreases in vaccine effectiveness.[1,2,5]

In 2010, California made headlines when pertussis cases warranted the label of epidemic with more than 9,000 cases, 809 hospitalizations, and 10 deaths.[6] Washington experienced its own epidemic two years later with a 1,300% increase in pertussis cases in 2012.[7] Nationally, the year 2012 produced the highest number of pertussis cases since the 1950's with 48,277 cases reported to the CDC.[4] This number more than doubled the cases reported in the previous year. Although pertussis cases have since decreased, pertussis has remained a concern as California reported another epidemic in 2014.[1] To date, there have been no studies to uncover a single cause for the recent rise in pertussis cases. Unvaccinated individuals and those who have not completed

the full course of pertussis vaccinations are at the highest risk for disease and pertussis-related death.[6]

1. Development of Vaccines for Pertussis Prevention

In the late 1990's, the Food and Drug Administration licensed an acellular pertussis vaccine known as the Diptheria, Tetanus, and acellular Pertussis (DTaP) vaccine, after the previously developed whole cell pertussis vaccine of the 1930's (known as DTP) caused concerns over safety and effectiveness in the United States.[2] The Advisory Committee on Immunization Practices recommends that the DTaP vaccine be administered to children at ages 2 months, 4 months, 6 months, between 15 and 18 months, and at 4 to 6 years.[8] In 2005, another vaccine known as the Tetanus, Diptheria, and acellular Pertussis (Tdap) vaccine was licensed for use in adolescents and adults.[2] This vaccine is administered as a booster dose between ages 11 and 18 years and can be received every 10 years to maintain protection.[2]

Although the DTaP and Tdap vaccines have significantly reduced the burden of pertussis in the United States, infants under the age of 3 months remain at high risk for pertussis infection and pertussis-related deaths because they have not yet been fully vaccinated against the disease.[6] Between 2004 and 2008, 83% of deaths from pertussis infection in the U.S. were attributed to infant aged three months or younger.[2] Because of the two-month waiting period for the DTaP vaccine, public health professionals have been tasked with creating solutions which would protect this at-risk population.

C. Immunization Practices to Protect Infants

A retrospective study of the 2010 California pertussis epidemic concluded that unrecognized pertussis in adolescent and adult contacts of infants was a significant source of pertussis in infants less than 6 months old, as most subjects were noted to have a household

contact with a cough at the time of infection.[9] Similar research has shown that parents and grandparents, as well as siblings to a varying degree, are significant sources of pertussis in infant cases.[10] In 2005, the Advisory Committee on Immunization Practices (ACIP) began recommendations for the use of the "cocoon method" as a protective measure against infant pertussis.[2] This method recommends that all close contacts of infants are advised to receive the Tdap booster vaccine at least two weeks prior to contact with the infant in an effort to shield the infant from pertussis infection.[11] Despite recommendations and an increase in adult vaccination coverage in the United States,[12] pertussis-related infant mortality has remained a significant problem warranting further efforts in protecting this at-risk population.

1. Maternal Tdap during Pregnancy

In 2012, the ACIP recommended the Tdap vaccine during every pregnancy as a protective measure for infants.[13] In 2013, the ACIP added to this recommendation, indicating that immunization should take place between weeks 27 and 36 of pregnancy.[13] As of this date, no recent systematic literature reviews have addressed the usage of the Tdap vaccine during pregnancy as a protective measure for infants. As this is a newly recommended strategy, there is a need for a systematic review to present and evaluate current research on this pertussis prevention strategy. This systematic literature review seeks to address the following research questions:

1. Are there any effects of receiving Tdap during pregnancy for both mother and infant?
2. Are there any reports assessing safety or adverse events associated with receiving Tdap during pregnancy?

3. Do any challenges or barriers exist in the implementation of the ACIP vaccination guidelines, including trends in Tdap acceptance and attitudes toward vaccinating during pregnancy?

Upon a complete analysis of the evidence presented, further steps to implement this strategy or create a new strategy may be taken by public health professionals.

II. Methods

The goal of this review is to investigate the effect, safety, and barriers, if any, to administering Tdap to women during pregnancy as a protective strategy against infant pertussis. Previous systematic reviews have assessed the use of the cocoon method of protection against pertussis, yet none have specifically reviewed Tdap vaccination in pregnancy. For this reason, and because this method is no longer the preferred protective strategy, articles that focused strictly on the cocoon method were not included in this review. The search strategy and analysis for this review was guided by the PRISMA Statement for Reporting Systematic Reviews.[14] The PRISMA Statement is a guide to developing systematic review methodologies and includes a checklist of items to include when reviewing articles.[14] The PRISMA Statement was selected for this review because it provided a framework to ensure that every article chosen for review met the necessary criteria and was fully analyzed in this report.

A. Search Strategy

Table 1 illustrates the search strategy utilized to collect articles for this review. Three search strategies were employed to attempt to account for the possibility for scarce and diverse publications. First, the online databases MEDLINE, ProQuest, PubMed, and ScienceDirect were searched for studies published in peer-reviewed journals. All study designs were considered for review due to the broad nature of the initial research question. As some searches yielded few

results, including all designs provided better odds that articles could be found through a search of article reference lists. Second, a separate search using the search strategy outlined in Table 1 was conducted using the New York Academy of Medicine's grey literature collection. Finally, additional articles were identified by searching reference lists of relevant studies.

B. Study Selection

Studies were included if the subject of their investigation pertained to pregnant women receiving the Tdap vaccine and/or the resulting health effects on their infants (under 12 months of age). Additional inclusion criteria included a publish date between January 2004 and February 2015 in a peer-reviewed journal. These dates were selected to coincide with the introduction of the Tdap vaccine. Studies were excluded if maternal Tdap was only administered to participants postpartum or if the focus of the article pertained to the cocoon strategy of pertussis prevention. Non-English studies were excluded, though non-US studies were considered for review. Literature reviews were excluded from analysis but considered for background information to establish rationale for a systematic review.

C. Quality Assessment

Studies selected for further review were organized under three categories: Effect of Maternal Tdap during Pregnancy on Infant Pertussis; Safety of Receiving Tdap Vaccine during Pregnancy; and Implementation of Recommended Vaccination Practices for Pregnant Women. These studies were reviewed and organized into data tables according to subject categories (see Tables 2, 3, and 4). Data tables were used to specify study design, sample, objectives, results, findings, and conclusions for all articles. Further exclusions of articles were made based on suspected bias or lack of relevant data (see Figure 1).

III. Results

The initial database search generated 195 articles, of which 52 were excluded because they were duplicates. Figure 1 illustrates further exclusion procedures in which 108 articles were excluded based on a review of article titles and abstracts. The majority of these articles were excluded because they did not pertain to maternal Tdap vaccinations (n=55). Other articles were excluded based on participant characteristics (i.e. non-pregnant women or infants over 1 year of age, n=30), an emphasis on the cocoon strategy (n=13), or non-English language (n=10). Upon a full-text review of 35 articles, 20 articles were further excluded based on reasons previously noted. Ultimately, 15 articles were selected for this review.

A. Study Identification

Articles selected for review were separated into 3 categories according to study objectives and subject matter: 1) Effects of Receiving Tdap during Pregnancy; 2) Assessments of Safety of Tdap during Pregnancy; and 3) Implementation of Tdap Vaccination Guidelines. Tables 2, 3, and 4 summarize study design, sample, objectives, results, findings, and conclusions of the articles within each category. Overlap among subject categories was common. Participants were women who were either pregnant at the time of investigation or who had given birth within a timeframe selected by the investigators. For case control studies, women who received Tdap during pregnancy represented case groups while women who were not documented as receiving Tdap during pregnancy represented the controls.[15, 16, 17, 18, 19, 20]

1. Effects of Receiving Tdap during Pregnancy

Eight of the studies selected for review investigated the effects of receiving Tdap during pregnancy; either in an attempt to explain how infants may be protected through this methodology or to compare Tdap during pregnancy with postpartum vaccination or the cocoon methodology (see Table 2). Five observational studies used maternal and infant blood samples to

measure the impact of maternal Tdap vaccination in pregnancy.[16, 17,21, 22, 23] Breast milk samples were used to determine pertussis-specific antibody levels in one study.[15] The remaining two studies used published data for their analyses on the effects of Tdap vaccination.[20,24]

a. Effects of Maternal Tdap on Newborn Pertussis Antibody Levels

Immunoglobulin G (IgG) is a type antibody that is responsible for defense against bacterial attacks and is transferred via placenta from mother to child.[25] Geometric Mean Concentrations (GMC) of IgG to pertussis toxins are used in studies to measure levels of protection against pertussis. Ercan et al.[22] examined the presence of anti-pertussis antibodies in term and preterm maternal and newborn cord blood samples to evaluate the process of mother-to-infant antibody transfer. Participants in this study were not vaccinated with Tdap.[22] This transplacental antibody transfer may explain the need for maternal Tdap vaccinations during pregnancy. Using an observational design, Ercan et al.[22] found that anti-pertussis antibody levels are naturally low in maternal-infant pairs, especially so for preterm pairs. In another study, transplacental transfer of pertussis antibodies was observed in pregnant women who received a Tdap booster vaccine at or past 20 weeks gestation and their newborns.[23] Prior to Tdap vaccination, significant anti-pertussis toxin (PT) levels were found in 37.1% of maternal samples whereas 90.2% of post-vaccination maternal samples indicated significant ($\geq$10 IU/ml) anti-PT levels.[23] Transplacental transfer ratio for anti-PT antibodies was 146.6% and at 2 months, 66% of participating newborns had significant anti-PT levels.[23]

A similar study was conducted to compare anti-PT antibodies in newborns of mothers who received Tdap to newborns of mothers who did not receive Tdap.[16] Based on concentrations of anti-pertussis antibodies in maternal and umbilical cord blood, Gall et al.[16] found a statistically significant increase in the odds that newborns of mothers who receive Tdap during pregnancy

will have protective antibodies against pertussis toxin compared to newborns of unvaccinated mothers.

Abu Raya et al.[15] investigated lactation as a method of antibody transfer from mother to infant. Breast milk of women who were vaccinated after the 20th week of pregnancy provided a greater GMC of pertussis-specific antibodies than that of women who were not vaccinated.[15] The most significant differences among the two groups were seen in the colostrum during late pregnancy, but detectable antibody levels remained in the vaccinated group throughout the 8-week postpartum period of study.[15] Significant decline in antibody levels were observed over 8 weeks in both groups.

To assess whether maternal Tdap affects infant response to DTaP immunization, Hardy-Fairbanks et al.[17] observed infant blood samples at birth, before DTaP immunization, and after DTaP immunization. At the time of birth, maternal and cord blood samples of the Tdap group had higher concentrations of anti-PT antibodies compared to the unvaccinated group.[17] These higher concentrations continued to be evident at the time of the 2 month mark in which DTaP was administered to the infants, however a lower concentration of antibodies was observed in the Tdap group after DTaP was given to the infants.[17] Differences between the Tdap group and the non-Tdap group were not evident at time of the 18 month booster DTaP vaccination.[17]

Using published data on infant pertussis hospitalizations in conjunction with literature on vaccine effectiveness, Peters et al.[24] estimated the impact of parental Tdap vaccination on infant pertussis hospitalizations. Overall findings indicated maternal vaccination (without paternal vaccination) at least 2 weeks prior to delivery could prevent between 1,347 and 6,909 hospitalizations of infants between 0 and 5 months of age.[24] Maternal vaccination at the time of

birth hospitalization and at 2 weeks postpartum was estimated to prevent between 1,093 and 6,139 hospitalizations and between 839 and 5,369 hospitalizations, respectively.[24] A similar analysis was conducted by Terranella et al.[20] using a cohort of U.S. births in 2009 estimate the impact of pregnancy dose Tdap on infant pertussis incidence, hospitalizations, and deaths. Based on this analysis, Terranella et al.[20] concluded that Tdap during pregnancy could reduce infant pertussis cases by approximately 33%, hospitalizations by 38%, and deaths by 49%. In a comparison to postpartum vaccinations, Tdap during pregnancy was found to be a more effective and more cost efficient option for reducing the burden of infant pertussis.[20]

b. Variation in Effect Based on Timing of Vaccination

One study observed the impact of timing on the effects of receiving Tdap during pregnancy using a prospective design.[21] Using Geometric Mean Concentrations (GMC) of IgG in newborn cord blood to measure protective power, Abu Raya et al.[21] measured the impact of vaccination in during weeks 27 to 30, weeks 31 to 36, and after the 36th week of pregnancy. The highest rate of anti-pertussis antibody transfer was seen between weeks 27 and 30 of pregnancy, indicating the highest odds for pertussis protection for infants.[21]

Based on a review of these eight studies, it is evident that the effects of maternal Tdap vaccination can be found in both cord blood and breast milk; however, effects are shown to be strongest within blood samples. [15, 16, 17, 22, 23, 24] Only one study looked at lactation as a method of transfer for anti-pertussis antibodies, which leaves room for further research to determine the effects of breastfeeding after receiving Tdap in pregnancy. Despite ACIP recommendations for vaccination between weeks 27 and 36 of pregnancy, a more accurate timeline for vaccination would be between weeks 27 and 30 of pregnancy.[21]

2. Assessments of Safety of Tdap during Pregnancy

Three articles sought to determine whether Tdap vaccination during pregnancy is safe for pregnant women as well as infants (see Table 3). To assess safety, reports of vaccine adverse events were reviewed and characterized according to whether or not Tdap was administered during pregnancy.[18,26] In one study, Tdap during pregnancy was associated with a small but statistically significant increase in risk of chorioamnionitis (bacterial infection of the fetal membranes).[18] Within this same study, no association was found between Tdap vaccination during pregnancy and increased risk of preterm delivery, SGA (Small for Gestational Age) birth, or fetal hypertensive disorders.[18] A retrospective cohort study involving mothers aged 12 to 45 who either received Tdap during pregnancy or had no documented Tdap vaccination found no significant difference in preterm delivery, gestational age, or birth weight of infant between both participant groups.[19]

All 3 studies concluded with statements to indicate that Tdap during pregnancy is as safe for mother and infant as not receiving the vaccine at all or opting to receive the Tdap vaccine after giving birth. A potential concern regarding the studies selected for safety assessments is a small sample size of pregnant women who received Tdap during pregnancy. One study attributed just 21% of the study sample (n=123,494) to women who received Tdap during pregnancy[18] while another attributed 20% of their sample size (n=690) to women who received Tdap during pregnancy.[19]

3. Implementation of Tdap Vaccination Guidelines

In addition to reviews of safety, four studies were selected for an assessment of general trends in Tdap vaccination and attitudes toward receiving the vaccine while pregnant (see Table 4). Kharbanda et al.[27] observed medical record and claims data from seven sites across the

United States (Northern California, Southern California, Colorado, Minnesota, Oregon, Washington, and Wisconsin) to assess Tdap vaccine uptake during pregnancy. Coinciding with recommendations from the California Department of Public Health for Tdap during pregnancy, the percentage of women in California who received Tdap during pregnancy increased between 2007 and 2011, from 0.3% vaccinated to 30% vaccinated, but this rate dropped to 19.5% in 2012.[27] Across all other sites included in this study, Tdap uptake during pregnancy rose from 0.8% in 2007 to 16% in 2012.[27]

In a retrospective cohort study, three factors were shown to be independent predictors for whether or not pregnant women would opt to receive the Tdap vaccine: 1) Black women were less likely to receive the Tdap vaccine; 2) Women who delivered preterm were less likely to receive the Tdap vaccine; and 3) Women were more likely to accept the Tdap vaccine during pregnancy if they had also received the influenza vaccine during pregnancy.[28] Racial disparities in vaccine acceptance were speculated to be a result of differing attitudes toward vaccination, however further research on this topic is required.[28] Lower rates of vaccination among women who delivered pre-term may be explained by the general trend of receiving the vaccine in the later stages of pregnancy.[28] The most frequently reported reason for vaccine refusal was concern for maternal and infant safety.[29]

The ACIP is a United States entity, however guidelines for Tdap during pregnancy have been implemented internationally.[29,30] In a cross-sectional survey of 402 pregnant women in Mexico City receiving prenatal care in three designated public healthcare centers, 16% of respondents reported some knowledge of pertussis and 57% indicated intent to receive the Tdap vaccine if offered.[29] More than 80% of survey respondents indicated that they would accept the vaccine if it was recommended by an obstetrician-gynecologist.[29] Similar findings were

produced in a cross-sectional survey of Australian women by Wiley et al.,[30] who found that women receiving a professional recommendation for Tdap were seven times more likely to accept Tdap vaccination. All four studies selected to assess challenges or barriers to implementing ACIP guidelines found that recommendations from health care professionals increased the odds that pregnant women would choose to receive the Tdap vaccine during pregnancy.[27,28,29,30]

IV. Discussion

The aims of this systematic literature review were to investigate the effects of receiving Tdap vaccination during pregnancy as a protective measure against infant pertussis, review reports on the safety of receiving Tdap vaccination during pregnancy for mother and child, and assess current trends in and attitudes toward Tdap vaccination among pregnant women as an indicator for the implementation of vaccination guidelines. Based on research which included meta-analyses as well as observational cohort studies, newborns of women who received the Tdap booster during pregnancy had the highest odds of protection against pertussis infection compared to newborns of women who received Tdap postpartum or did not receive the Tdap booster at all.[15, 16, 17, 20, 21, 22, 23, 24] This protection is a result of anti-pertussis antibody transfer from mother to child via breast milk[15] and the placenta.[16, 17, 21,22, 23] Although the evidence supporting antibody transfer via breast milk was significant, only one study explored this method of mother-to-child protection. Antibody transfer via lactation is an area that should be further examined to determine if there is an added protective benefit in breastfeeding.

As with any medical procedure, it was necessary to review all available evidence pertaining to the safety of this vaccination strategy. Based on the results of two cohort studies and one clinical review, Tdap during pregnancy was generally accepted as a safe procedure.[18, 19,

[26] One study did find a small but statistically significant increase in risk for chorioamnionitis, but no association was found with other conditions such as hypertensive disorder or preterm birth.[18] Assessing the safety of this protective strategy is essential when considering future directions for prenatal health care.

To assess the implementation of the ACIP guidelines for Tdap during pregnancy, this review included four articles on the topic of vaccination trends and attitudes toward vaccination during pregnancy among pregnant women.[27, 28, 29, 30] A common conclusion among these articles indicates that women are more likely to choose to receive the Tdap booster if it is recommended by a health care professional. [27, 28, 29, 30] One issue that surfaced in reviewing these articles was apprehension in receiving Tdap among pregnant women based on a lack of knowledge of pertussis and the Tdap vaccine or a fear of harming their unborn child.[29, 30] Black women were found to be less likely to receive Tdap during pregnancy, however no explanation was provided.[28] There remains a need to research this finding to determine whether there are any barriers to receiving the Tdap vaccine. Future implementation efforts should take into consideration these potential barriers and factors of vaccine refusal in order to effectively increase Tdap vaccination among pregnant women and ultimately reduce the prevalence of pertussis among infants.

V. Limitations

As the research on the effects of maternal Tdap during pregnancy is somewhat recent, this systematic review was limited by the availability of studies that fit the designated criteria. In the process of article collection, many studies appeared to have a greater emphasis on postpartum vaccinations as well as the cocoon strategy for pertussis protection. Sample size presented another limitation as many of the studies investigated relatively small proportions of women who

received the Tdap vaccine during pregnancy. Although findings were significant, these conclusions may have been strengthened by a larger proportion of women who received Tdap during pregnancy. Safety assessments may have been further strengthened by larger sample sizes.

VI. Conclusion

The Advisory Committee on Immunization Practices began recommending the Tdap vaccine booster in pregnancy in 2012.[2] Despite the relatively recent nature of this recommendation, and therefore limited selection of research studies, evidence presented here appears to support the ACIP's guidelines for pregnant women. Tdap vaccination during pregnancy has been shown to be a safe[18, 19, 26] and effective method[15, 16, 17, 20, 21, 22, 23, 24] of providing pertussis protection to infants until they are old enough to receive DTaP vaccination at 2 months old. Efforts to implement the ACIP guidelines for Tdap during pregnancy should target health care professionals as informational sources for pregnant women. Future research efforts should seek to include a larger sample of pregnant women who receive Tdap during pregnancy. Additionally, future research should investigate disparities in Tdap usage to determine whether cultural, geographical, or socioeconomic barriers exist.

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VIII. Tables & Figures

Table 1, Database Search

Databases	Search Terms	Other Criteria
Medline Complete, ProQuest Social Sciences, PubMed, ScienceDirect, NYAM grey literature collection	"Maternal Tdap"; "Maternal Tdap" AND "Pregnancy"; "Tdap" AND "Pregnancy"; "Tdap" AND "Infant"; "Tdap" AND "Infant Pertussis"; "Pregnancy" AND "Infant Pertussis"; "Pregnancy" AND "Tdap" AND "Safety"; "tetanus diphtheria acellular pertussis" AND "pregnancy"	Full text; Human; English Language; Peer-reviewed; Date range: 2004-2015

Figure 1, PRISMA Flow Chart

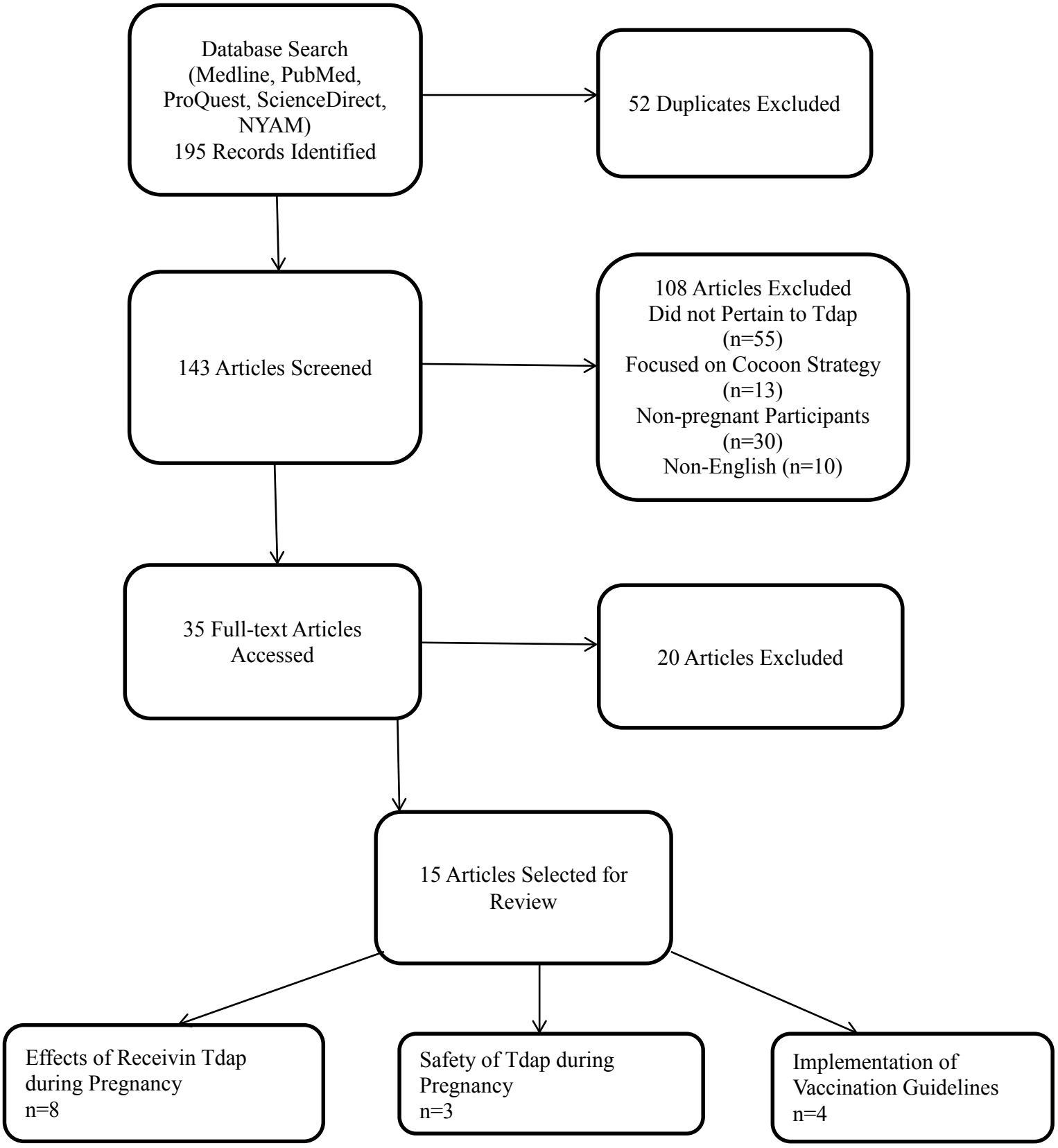

Table 2, Evidence Table – Effects of Receiving Tdap During Pregnancy

Reference	Design	Population/Sample	Objectives	Results	Findings	Conclusion
Abu Raya B, Srugo I, Kessel A, et al. The effect of timing of maternal tetanus, diphtheria, and acellular pertussis (Tdap) immunization during pregnancy on newborn pertussis antibody levels - A prospective study. *Vaccine* 2014;32(44):5787-93.	Prospective Study	Women immunized with Tdap after the 20th week of pregnancy	Determine if there is a most effective time period for maternal Tdap vaccination in order to provide antibodies to the infant	GMCs of IgG to pertussis toxin were higher in newborn cord sera when women were immunized at 27-30 weeks compared to newborns of women immunized at 31-36 weeks and >36 weeks	Immunization between 27-30 weeks in pregnancy was associated with the highest amount of antibodies compared to measures of immunizations after 31 weeks of pregnancy	Vaccination guidelines should recommend immunization between weeks 27 and 30 of pregnancy for highest odds of protection against pertussis in infants
Abu Raya B, Srugo I, Kessel A, et al. The induction of breast milk pertussis specific antibodies following gestational tetanus–diphtheria–acellular pertussis vaccination. *Vaccine* 2014;32(43):5632-5637.	Case Control	Women who received Tdap after 20th week of pregnancy and unvaccinated women	Measure pertussis-specific antibodies, total protein, and their ratio in breast milk following gestational Tdap vaccination	GMCs of IgG to PT: case (24.12 EU/ml) vs control (8.18 EU/ml)	Some pertussis-specific antibodies were significantly higher among vaccinated women compared to the controls. Lactation may be beneficial in protecting infants against pertussis	Lactation may increase infant protection against pertussis if mothers were vaccinated during pregnancy
Ercan TE, Sonmez C, Vural M, Erginoz E, Torunoğlu MA, Perk Y. Seroprevalance of pertussis antibodies in maternal and cord blood of preterm and term infants. Vaccine 2013;31(38):4172-6. doi:10.1016/j.vaccine.2013.06.088.	Observational	100 preterm infant-mother pairs; 100 term infant-mother pairs Cord & maternal blood samples between June 2011 & January 2012	Determine antibody concentrations against pertussis antigens in cord & maternal blood of infant-mother pairs; Evaluate efficacy of transplacental antibody transfer	Cord GMCs for anti-PT in preterm group were 13.15 ELISA U/ml; in term group were 19.46 EU/ml; Placental transfer ratios for anti-PT were 68% for	Anti-pertussis antibody levels are generally low in infant-mother pairs, more so in preterm than in term infants	Maternal Tdap may provide added protection to preterm infants in addition to the cocoon method of protection

				preterm, 107% for term group		
Reference	**Design**	**Population/Sample**	**Objectives**	**Results**	**Findings**	**Conclusion**
Gall SA, Myers J, Pichichero M. Maternal immunization with tetanus-diphtheria-pertussis vaccine: effect on maternal and neonatal serum antibody levels. Am. J. Obstet. Gynecol. 2011;204(4):334.e1-5.	Observational	Pregnant women attending University of Louisville Obstetrical Clinic between October 2008 & December 2009	Determine whether Tdap in pregnancy provides newborns antibodies against pertussis compared to mothers who did not receive Tdap	Newborns of mothers who received Tdap had sig. higher concentrations of diphtheria antitoxin, tetanus antitoxin, and antibodies to pertussis toxin, filamentous hemaglutinin, pertactin, and fimbriae 2/3 compared to newborns of mothers who did not receive Tdap	Significant increase in odds that newborns of mothers who receive Tdap during pregnancy have antibodies that may protect against diphtheria, pertussis toxin, and fimbriae 2/3	Maternal Tdap during pregnancy may prevent neonatal pertussis infections
Hardy-Fairbanks AJ, Pan SJ, Decker MD, et al. Immune responses in infants whose mothers received Tdap vaccine during pregnancy. Pediatr. Infect. Dis. J. 2013;32(11):1257-60.	Cohort	Cord and maternal blood samples; Infant serum collected before and after DTaP	Determine whether prenatal Tdap vaccination reduces infant immune responses to routine DTaP immunization	At birth, maternal & cord antibody concentrations to pertussis antigens were higher in case group; At DTaP immunization, higher concentrations in case group; After DTaP, conentrations lower in case group	Concentrations before and after booster dose of DTaP were similar in both groups	Maternal immunization with Tdap results in higher pertussis antibody concentrations for infants between birth and the first dose of DTaP; these immune responses decrease slightly between DTaP and booster

Reference	**Design**	**Population/Sample**	**Objectives**	**Results**	**Findings**	**Conclusion**
Peters TR, Banks GC, Snively BM, Poehling KA. Potential impact of parental Tdap immunization on infant pertussis hospitalizations. Vaccine 2012;30(37):5527-32.	Meta-Analysis	Published data on infant pertussis hospitalizations	Impact assessment for parental Tdap vaccination before delivery, at the time of delivery, and at 2 weeks after delivery.	Immunizing before pregnancy or ≥2 wks before delivery may reduce infant hospitalizations by 2694-9314 in infants	Greater reductions in pertussis could result if parents are immunized ≥ 2 weeks prior to delivery	Immunizing before delivery is ideal. Postpartum vaccination may also provide protection to infants.
Terranella A, Asay GRB, Messonnier ML, Clark TA, Liang JL. Pregnancy dose Tdap and postpartum cocooning to prevent infant pertussis: a decision analysis. Pediatrics 2013;131(6):e1748-56.	Decision Analysis – Cohort Model	US 2009 births	Compare effect of Tdap during pregnancy with postpartum Tdap and cocooning to prevent infant pertussis; Assess cost-effectiveness	Pregnancy vaccination could reduce annual infant pertussis incidence by 33%, hospitalizations by 38%, and deaths by 49%	Pregnancy vaccination could prevent a greater proportion of cases, hospitalizations, and deaths compared to postpartum vaccination	Vaccinating during pregnancy could prevent more pertussis cases and is more cost-efficient than postpartum cocooning
Vilajeliu A, Goncé A, López M, et al. Combined tetanus-diphtheria and pertussis vaccine during pregnancy: transfer of maternal pertussis antibodies to the newborn. Vaccine 2015.	Observational	Pregnant women vaccinated with Tdap ≥20wks & their newborns	Compare PT antibody levels in women during pregnancy in terms of levels in newborn at delivery	≥10IU/ml anti-PT levels were found in 37.1% of maternal pre-vacc samples; 90.2% of maternal post-vacc samples; 94.7% of newborns	Transplacental transfer ratio was 146.6%; At 2 months, 66% of newborns had anti-PT levels ≥ IU/ml	Vaccination of pregnant women is a sufficient strategy to protect infants until they are able to receive DTaP

Table 3, Evidence Table – Assessments of Safety in Receiving Tdap During Pregnancy

Reference	Design	Population/Sample	Objectives	Results	Findings	Conclusion
Kharbanda EO, Vazquez-Benitez G, Lipkind HS, et al. Evaluation of the association of maternal pertussis vaccination with obstetric events and birth outcomes. JAMA 2014;312(18):1897-904.	Retrospective observational cohort	Women who gave birth between January 2010 and November 2012, receiving Tdap during pregnancy (21%) and not receiving Tdap during pregnancy (79%)	Evaluate whether maternal Tdap during pregnancy is associated with increased risk to adverse obstetric events or birth outcomes	Crude estimates for preterm delivery were 6.3% for vaccinated group, 7.8% unvaccinated; For SGA birth, 8.4% for vaccinated, 8.3% for unvaccinated; chorioamnionitis diagnosed in 6.1% of vaccinated, 5.5% in unvaccinated	Vaccination was not associated with increased risks of preterm delivery or SGA birth; small but statistically significant increase in risk for chorioamnionitis	Tdap vaccination was associated with a small increase in risk of chorioamnionitis, but did not associate with increased risk of preterm delivery, SGA birth, or hypertensive disorders
Shakib JH, Korgenski K, Sheng X, Varner MW, Pavia AT, Byington CL. Tetanus, diphtheria, acellular pertussis vaccine during pregnancy: pregnancy and infant health outcomes. J. Pediatr. 2013;163(5):1422-6.e1-4.	Retrospective cohort	Pregnant women 12-45 years old who received Tdap and their infants; mother-infant pairs without documented Tdap vaccination	Assess pregnancy and brth outcomes in infants born to women who did or did not receive Tdap during pregnancy	One or more congenital anomaly was identified in 3.7% of case infants, 4.4% of control infants; Diagnosis of complex chronic conditions within 12mos in 3.6% of case infants, 10.4% of control infants	No significant difference in preterm delivery, gestational age, or birth weight between case and control groups	No increase in adverse outcomes when women received Tdap vaccine during pregnancy, however Tdap in pregnancy was uncommon and most often administered in 1st trimester as prophylaxis

Reference	**Design**	**Population/Sample**	**Objectives**	**Results**	**Findings**	**Conclusion**
Zheteyeva YA, Moro PL, Tepper NK, et al. Adverse event reports after tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccines in pregnant women. Am. J. Obstet. Gynecol. 2012;207(1):59.e1-7.	Clinical review	Reports to the Vaccine Adverse Event Reporting System	To characterize reports of vaccine adverse events (AE) of pregnant women who received Tdap	No maternal or infant deaths reported; 42% described no adverse event; 16.7% of pregnancy-specific AEs were spontaneous abortion; 4.5% of non-pregnancy-specific AE were injection site reactions	Tdap during pregnancy did not produce significant adverse events in maternal or infant outcomes	There are no safety concerns associated with administering Tdap in pregnancy

Table 4, Evidence Table – Implementation of Tdap Vaccination Guidelines

Reference	Design	Population/Sample	Objectives	Results	Findings	Conclusion
Goldfarb IT, Little S, Brown J, Riley LE. Use of the combined tetanus-diphtheria and pertussis vaccine during pregnancy. Am. J. Obstet. Gynecol. 2014;211(3):299.e1-5.	Retrospective cohort	Women who delivered at university hospital between February and June 2013	Describe uptake of Tdap and identify predictors of vaccine acceptance in pregnancy	81.6% (n=1194) if cohort received Tdap	Three factors found to be independent predictors of receiving Tdap; Patients more likely to receive Tdap if they received influenza vaccine during pregnancy; Black women were less likely to receive Tdap; Women who delivered preterm were less likely to receive Tdap	High uptake of Tdap seen following ACIP recommendations, but factors may predict non-acceptance of Tdap during pregnancy
Kharbanda EO, Vazquez-Benitez G, Lipkind H, et al. Receipt of pertussis vaccine during pregnancy across 7 Vaccine Safety Datalink sites. Prev. Med. (Baltim). 2014;67:316-9.	Observational cohort	Medical record and claims data from Vaccine Safety Datalink sites	Describe Tdap coverage among pregnant women	25.3% of all participants received Tdap before pregnancy; 7.1% received Tdap during pregnancy; 10.8% received Tdap within 6	Receipt of Tdap during pregnancy increased in 2010 and 2011, but decreased in 2012	Substantial increases in Tdap coverage were seen following recommendations by the CDPH and ACIP

				weeks of pregnancy end		
Reference	**Design**	**Population/Sample**	**Objectives**	**Results**	**Findings**	**Conclusion**
Varan AK, Esteves-Jaramillo A, Richardson V, Esparza-Aguilar M, Cervantes-Powell P, Omer SB. Intention to accept Bordetella pertussis booster vaccine during pregnancy in Mexico City. Vaccine 2014;32(7):785-92.	Cross-sectional	Pregnant women receiving prenatal care between March & May 2012	Examine influences on intention to accept Tdap booster in pregnancy	57% of participants expressed intent to accept booster; >80% would accept Tdap if recommended by OB/GYN	Most frequent reason for refusal was concerns of harming self or fetus	Promoting awareness of pertussis and vaccine safety, in addition to encouraging professionals to recommend Tdap, may increase uptake
Wiley KE, Massey PD, Cooper SC, Wood N, Quinn HE, Leask J. Pregnant women's intention to take up a post-partum pertussis vaccine, and their willingness to take up the vaccine while pregnant: a cross sectional survey. Vaccine 2013;31(37):3972-8.	Quantitative/survey	Pregnant women in New South Wales, Australia	Determine awareness and intentions toward recommendations for Tdap & willingness to accept during pregnancy if recommended	80% showed willingness to receive vaccine in pregnancy if recommended; 34% intended to receive Tdap postpartum; 17% received vaccine previously; 45% had not heard of/were undecided on Tdap	Women who received a recommendation were 7 times more likely to report intent to vaccinate	Healthcare provider recommendations are a significant factor in pregnant women's decision to receive Tdap in pregnancy

IX. Appendix

Capstone Paper or Master's Essay Checklist

Student _____ _____ Faculty reviewer__M. Crum_____ Date____May 5, 2015__

Title of Capstone research or practice paper: _____Bike share and equity in NYC_____

Is this paper a Master's Essay? Yes ____ No __x__

C = Completely S = Substantially P = Partially N = Not at all N/A = Not applicable

	C	S	P	N	N/A	Comments on Quality
1.Provided a **Structured Abstract** (≤250 words)	x					
2.Provided an accurate **Table of Contents**	x					
3.Provided an **Introductory** section including:	x					
*a. **Scope** of the problem and public health s**ignificance***	x					
*b. Summary of **relevant scientific knowledg**e and policies*	x					
*c. Identification of relevant **gaps in knowledge***	x					
*d. Clear **rationale** for the project*	x					
e. Summary of what will be covered in the paper (aims)	x					
f. Clear description of research conducted or project undertaken (and student's role in the process)		x				In Methods section, suddenly switches to 2nd person plural, but does not explain who the "we" is. If others involved in analysis, should put brief paragraph up front (or as footnote) describing teams and roles.
4. Described the **Methods or Processes** including:						
a. Population, setting, sites and sample (if relevant)		x				Utilization data is "population data," however the sampling of "time" is relevant and not discussed in paper. What implications does the selection of summer months as the "time" sampled have on the findings?

	C	S	P	N	N/A	Comments on Quality
b. Description of information/data collection procedures and measures (qualitative or quantitative)or Process used to develop project	x					Be clear and explicit up front about your unit of analysis being the trip, not a biker (you do this well at the end). You should review language to make sure you are not making "people" level claims. It is tempting to say that older women with discounted memberships were more likely to use the bikes than older women with full pay memberships. However, can't do that.
c. Relevant data manipulation & analytic techniques used	x					Overall, very well described. See notes by p.# at end.
5. Presented **Results or Project Outcomes**, including:						
a. Description of sample characteristics, or description of process outcomes	x					
b. Descriptive information on relevant risk factors and outcomes , or on curriculum, intervention or policy components that were assessed, adopted or tested	x					
c. Subgroup analysis, as appropriate	x					
d. Clearly labeled graphs and figures		x				
e. Correctly used & interpreted measures and/or statistical tests	x					
6. Synthesized findings in a **Discussion Section**, including:						
a. Succinct synthesis of results	x					
b. Interpretation of results in context of literature	x					
c. Summary of strengths and limitations of project	x					
d. Recommendations based on study or project findings and a conclusion/take home message						
7. Organized paper logically and in accordance with instructions, including:						
a. Correct length (3000-5000 words) and format (subheadings, margins, spacing)			x			
b. At least a minimum of 15 references, including ≥6 peer-reviewed sources	x					
c. Complete references, using AJPH format	x					

	C	S	P	N	N/A	Comments on Quality
d. Proper attribution for all facts	x					
e. Correct spelling and grammar	x					
8. Organized paper in a clear and effective **style,** including:						
a. Ideas within & between paragraphs laid out in a clear & logical fashion	x					
b. Clear paper flow; readable	x					
c. Appropriate language for scientific writing	x					

Action to be taken, please check one:

___This paper is acceptable with no revisions.

___This paper should be acceptable once the author makes the indicated revisions.

___This paper should be acceptable once the author makes the major revisions indicated

___This paper is unacceptable.

Please comment on your reason for selecting the above choice:

This is a strong and well written paper. Whether it is acceptable with revisions or acceptable as is I will leave to Prof. Faber.

P2. And p. 10. When describing objectives be more explicit (esp in abstract). Your objective was to compare bike share *trip characteristics* between rides taken by full pay members and rides taken by discount members who were targeted in low income communities. Through examination of utilization data, you hoped to make inferences about the success of the equity program and develop ideas for further testing. (or something like that)

p. 12. In describing you data cleaning procedures, your use of terminology is not quite right. I think you mean to say that you recoded text variables (those where the data was comprised of words) to either dichotomous variables (two levels, usually coded 0 1 and often "oppostite" or to categorical variables (multiple categories that are not implicitly better/worse, higher/lower, etc.). you recoded age into an ordinal variable (unequal categories that have order).

p. 15. Includes an example of language-around-sampling-unit problem. You say, "Among women in particular, discounted members appear to be older than general members." But really all you can say is that

a greater proportion of the discounted rides was taken by older women, compared to the full-pay rides. Use caution throughout with respect to how you articulate findings that are based on *rides*, not riders. You do not know to what extent your data are driven by repeat users.

Seasonality

Bike trip data likely have seasonality. If we suspect that membership type is driven by race and economics, how might patterns of summer time use of bikes differ by race and economics.

Conclusions

These data suggest that equity programs can be successful and that rides taken by discounted members do not look that different from rides taken by full pay members. However, since trip is unit of analysis, can you conclude that program successfully overcame barriers to ridership? Do you have any user data that could speak to that question?

Tables

Tables should not be SPSS output.

Many tables (4,5,6 and 7) should be oriented in the opposite direction. In other words, since you are comparing general to discounted rides (not "member") that data should be in your column, so reader can easily compare. For example, look how hard it is to compare the 29.9% and the 51.1% in Table 6. Those are the numbers you want to highlight, not hide. And the eye likes to compare *across*, not up and down. Keeping type of ride in the columns will also avoid having to repeat so much text as in Table 4 which completely replicates the table (mean, median, st. dev., etc.). Same for Table 5, in which you don't even need the "outside commute time" data. The title is Trips Taken During Weekday Commute, so just show that data.

Overall, great job. I know these data fell short of what you wanted and I'm sure they were difficult to work with. Your background is one of the best I've read. And you do find a "gap."

FINAL

Bike share and equity in New York City: Research on the utilization of the Citi Bike discounted membership program

Graduate Student
Hunter School of Public Health, Community Health Education Program

Submitted to Dr. Karyn Faber
May 16, 2015

ABSTRACT

Background
Public bike sharing systems can facilitate active transportation by increasing population access to bicycles, thereby increasing population levels of physical activity. But, bike sharing systems across the country struggle to reach those who could benefit from them most. In response, many systems have developed equity initiatives. By examining trip-level data, we assessed one such initiative in New York City, and developed recommendations for system administrators.
Methods
We obtained three months of complete Citi Bike utilization data and compared discounted members to general (full-price) members. We examined personal characteristics (gender and age), and trip characteristics (trip duration, trip start day and time, and trip start location).
Results
Citi Bike members took 2,494,553 trips from June 1, 2014 through August 31, 2104. Discounted members accounted for .6% of all trips (15,427). Men under age 45 took the majority of all trips, but a higher proportion of trips were taken by women and those ages 45+ among discounted members. Discounted members' trips had similar characteristics to general members' trips.
Conclusion
Citi Bike's discounted membership program is more gender equitable than general cycling in New York City, and suggests a demand for active transportation options for low-income older women. Discounted members' use of the Citi Bike system suggests that some low-income New Yorkers have integrated bike sharing into their travel habits. A better understanding of the initiative's target population and a plan for program growth based on repeated data analysis are recommended.

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INTRODUCTION

The health benefits of physical activity are well-established.[1] Active transportation – biking and walking to destinations – can increase physical activity, and has been associated with better fitness, reduced risk for cardiovascular disease, and lower rates of obesity and diabetes.[1,2,3] In a nation where nearly 63% of adults are overweight or obese, more than 80% of adults do not meet physical activity guidelines, and only 1% of all trips are taken by bicycle, initiatives to increase bicycling, particularly bicycling for transportation, are now a major public health aim. [4,5,6,7] *Healthy People 2020* targeted a 100% increase in the proportion of trips under five miles American adults make by bicycle, emphasizing the potential of active transportation. [8]

A national survey of over 16,000 adults found that nearly half of Americans age 18 and older (48%) do not own an operational bicycle, though 54% reported that bicycling is convenient and 53% would like to ride more often.[9] By increasing population access to bicycles, public bike sharing programs have the capacity to help reach the *Health People 2020* benchmark, contributing to population levels of cycling and, as a result, increasing population levels of physical activity.[10,11] However, bike sharing systems across the country have been criticized for failing to reach women, low-income individuals, and people of color, despite their efforts to do so.[12] This study, the first of its kind, evaluated one such effort in New York City, describing the characteristics of low-income residents who joined and used the city's bike sharing system, and the characteristics of their bicycle trips over the course of three months in 2014. The findings from this study may be useful to academics, health professionals, and bike share system operators, who, until now, have had

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little or no information on which low-income individuals incorporate bike sharing into their lives and how they do so.

Background

Public bike sharing systems make bicycles available for short-term rentals from a network of self-service stations, typically located throughout a city center. Considered a relatively easy and affordable way to enhance existing transit infrastructure, bike sharing claims many benefits beyond increasing physical activity, from reducing carbon emissions, noise pollution, and traffic congestion to improving mental health.[7] Since the country's first Information-Technology-based system launched in Tulsa, Oklahoma, in 2007, the number and size of bike sharing systems in the United States has grown rapidly.[13] In 2014, 34 systems were operating in the U.S., with new programs debuting annually.[14]

New York City's bike sharing system, the largest in North America, launched in May 2013 with 6,000 bicycles at over 330 stations in Manhattan and Brooklyn. An initiative of the NYC Department of Transportation, Citi Bike is privately funded through corporate sponsorships and does not rely on any public funding. NYC Bike Share, a private company, handles day-to-day operations of the system, including sales, marketing, and promotion. Citi Bike access is available through the online purchase of an annual membership or through the purchase of a 24-hour or 7-day casual pass at any station kiosk. Nearly two years after launching, the system has sold over 120,000 annual memberships and hundreds of thousands more casual passes; users have taken a total of 16 million trips and traveled an estimated 30 million miles.[15]

One study of Barcelona's bike sharing system, Bici, found that the Bicing initiative increased cycling trips in that city by 30% between 2007 and 2011.[16] Bike share system

operators and city officials seeking to implement new systems are often interested in highlighting this impact and promoting the health benefits gained through their members' activity.[13] In New York City, Citi Bike assessed its users burned 50 million calories in just the first month of operation (assuming a calorie burn rate of 40 calories per mile biked).[13] Similar systems tout more specific health benefits: a 2012 survey of Capital Bikeshare users in Washington, D.C., found that of over 3,100 responses, 31.5% reported reduced stress, and about 30% indicated they lost weight due to using Capital Bikeshare.[13]

Equity Concerns

Across the country, though, bike sharing systems struggle to achieve *equity*, defined in part by the National Academy of Public Administration as "the fair, just, and equitable management of all institutions serving the public directly or by contract; and the fair and equitable distribution of public services…".[14] Bike sharing systems predominantly serve young, white, well educated, affluent men - subgroups already at lower risk for those chronic diseases physical activity can help to prevent.[13,17,18] While Citi Bike member demographic information is not released to the public, "riders are mostly white, male, and live in households with six-figure incomes," according to one staff member.[12] More broadly, bike sharing systems simply do not reflect the diversity of the cities in which they are located and fail to reach those who could benefit from them most.[14,17]

This situation is a "looming concern" for many bike sharing programs, especially those receiving large government subsidies, but also for those privately funded systems, like Citi Bike, that position themselves as extensions of public transit rather than luxury items.[14] As bike sharing becomes more commonplace in the U.S., there is public and political pressure for systems to address the "equity issue," expanding service to

underserved neighborhoods and groups.[17,14] Many of them already attempt to – across the country, nearly all system operators have implemented some sort of equity or accessibility program targeted at low-income, "hard-to-reach" populations.[17] Out of 20 responses to a 2012 survey of system operators from the U.S. and Canada, 35% had existing stations sited based on equity reasons, 35% offered subsidized membership, 25% had annual membership payment plans, 25% assisted low-income members to obtain bank accounts and credit/debit cards (necessary for enrollment), and 25% waived a common security deposit hold on low-income users' credit/debit cards.[17]

Despite these efforts, uptake among equity initiative target populations has been minimal, blamed in large part on improper bike share station siting in low-income communities, prohibitive membership costs, credit/debit card requirements, and marketing materials that portray only the dominant culture.[17,13,14] Evaluators of one bike sharing equity initiative implemented in Minneapolis, Minnesota, found that environmental change alone, like the installation of a bike sharing station in a low-income community, may not be enough to lead to substantial and sustained changes in travel behavior among the target population.[19] Researchers suggested that advice and support at the individual and institutional level may be necessary, and that strategies to promote bicycling should focus on tackling deterrents and barriers to bicycle riding behaviors.[19] These include the danger and unpleasantness of cycling in traffic, the generally negative image of cycling as a childhood activity, and the perception of bicycles as being largely for leisure or sport rather than transportation.[19]

Citi Bike Discounted Membership Program

Originally conceived by the NYC Department of Transportation, in its original implementation, Citi Bike's equity initiative did not address the demographic, psychological, cognitive, or emotional factors related to physical activity or bicycling among low-income individuals, women, and people of color, who make up the majority of its target population. Among these groups, studies have shown the significance of various factors, from age, weight, and self-efficacy to social support, past exercise behavior, gender-based transportation responsibilities, and perceived risk.[20,21,17] Instead, like most equity initiatives that exist within the bike sharing industry, Citi Bike predominantly focused on cost and the mechanics of signing up for membership (i.e. resources for those without debit/credit cards).[17,13,14]

Since the system opened in 2013, Citi Bike has offered a $60 annual membership to every NYC Housing Authority (NYCHA) resident age 16 and older and to members of three Community Development Credit Unions (CDCU), which provide mainstream financial services to low-income populations in high poverty neighborhoods. Originally $35 less than a full-price annual membership (then $95), the discounted rate is now $89 less for NYCHA residents and select CDCU members ($149 full-price). Discount program members must pay the full $60 price of annual membership upon enrolling; the system does not offer a monthly payment option. Citi Bike and the NYC Department of Transportation (NYC DOT), which planned the implementation and oversees day-to-day operation of the system, promoted the discounted membership option through traditional means, such as brochures, newspaper and online articles; through social media; and through outreach events. NYC DOT distributed thousands of free bike helmets at nine giveaway events at

NYCHA developments during summer 2013, immediately after the Citi Bike system launched. While top-level NYCHA administrators were involved in the planning of these promotions, very few residents and only one local housing development manager were included in the discounted membership program outreach process.

Many bike sharing systems are criticized for seemingly profit-driven station placement that excludes low-income communities. As Morabia pointed out, for a bike sharing program to be more egalitarian, the distribution of bike docks needs to be thought out carefully; equity may be more easily achieved when high-rise housing projects are surrounded by affluent areas, rather than relegated to the periphery of the city.[22] Because public housing is interspersed throughout New York City, and throughout the Citi Bike service area, Citi Bike avoided such a critique, launching with nine stations placed directly on NYC Housing Authority property in Manhattan and Brooklyn, well integrated into the Citi Bike system. One of the country's densest bike share systems, more than 20 NYCHA housing complexes are within one-quarter mile of a Citi Bike station, providing convenient access to tens of thousands of potential discount program members. [FIGURE 1]

To date, the Citi Bike discounted membership program has not undergone internal or external evaluation.

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Gaps in Data

Despite bike sharing's relatively recent arrival to the U.S., comprehensive research is available on bike sharing business models, industry trends, and user impacts, and research has consistently assessed user demographic data from individual systems.[1] Thanks to open data policies held by many bike share system operators, analysis of system utilization data has been widespread, particularly by bloggers, news reporters, cartographers, and data

visualization experts. However, only a small amount of academic research is available on the facilitators and barriers to public bike share system usage, and only two studies from the grey literature systematically address equity initiatives across various North American bike sharing systems.[17,13,14,23] Only one peer-reviewed article directly addresses bringing bike share to a low-income community in the United States.[1] One unpublished study by Thomas Stead, a graduate student of city and regional planning in Brooklyn, New York, reported on factors that deterred NYC Housing Authority residents from using the Citi Bike system in 2014.[24] To date, no research has been published on the actual use of a bike sharing system by those target populations of equity initiatives: women, low-income individuals, and people of color.

The primary objective of the present study was to determine who uses the Citi Bike discounted membership program and how those individuals use the Citi Bike system. Specifically, the study aimed to identify the following: (1) characteristics of Citi Bike discount program members, and how they differ from or are similar to general (full-price) members; and (2) characteristics of Citi Bike discount program members' trips, and how those trips differ from or are similar to general members' trips. By analyzing three months of Citi Bike utilization data, we hoped to make inferences about the success of the equity initiative and develop recommendations for program administrators.

Unfortunately, because the dataset provided did not include unique identifiers for each trip, such as a Citi Bike user ID number, it was impossible to gauge the exact number of members who used the Citi Bike system or the frequency with which they did so. The data indicated only the proportion of trips taken by general members and discounted members and the characteristics of those trips.

The study was conducted under the supervision of Philip Noyes, Director of Research, Planning, and Evaluation at the NYC Department of Health and Mental Hygiene Brooklyn District Public Health Office, who is part of a team studying the personal characteristics of all Citi Bike members.

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We hypothesized that a disproportionately high number of discounted member trips were taken by men under age 40 – those most likely to use a bike sharing system anywhere in the U.S.[1] We hypothesized that Citi Bike discounted members took less than 1% of all Citi Bike trips over the time period in question, since less than 1% of Citi Bike annual members enrolled through the system's equity program, based on information provided by NYC Bike Share. Additionally, we hypothesized that discounted members' trips were more likely to be taken to or from ZIP codes with NYCHA developments or high poverty levels, and that discounted members' trips were more likely to have the characteristics of recreational trips (as indicated by lengthy duration and occurring outside weekday commute times, for example).

METHODS

NYC Bike Share provided anonymized system utilization data for all trips taken from June 1, 2014 though August 31, 2014. NYC Bike share defines a trip as any time a Citi Bike member or casual user releases and returns a Citi Bike at any station within the system. Utilization data comprised: trip duration (in seconds), start date and time, stop date and time, start station number, start station name, start station latitude and longitude, end station number, end station name, end station latitude and longitude, bike ID number, user type (annual member vs. casual user), birth year, and gender. Publicly available to view

and download as Excel files from the Citi Bike website, monthly system utilization datasets do not include personally identifiable information (e.g. Citi Bike User ID number).

For the purposes of this study, the utilization data provided to us by NYC Bike Share included one additional variable: discount type. In an extra column within each dataset, discounted members were identified as "NYCHA CDCU" or "CDCU New Member;" general (full-price) members were left blank. A "NYCHA CDCU" designation meant that the Citi Bike member was a NYC Housing Authority resident or Community Development Credit Union member before Citi Bike launched in May 2013, and purchased a discounted Citi Bike membership using a personal discount code related to his NYCHA or CDCU identification number. A "CDCU New Member" designation meant that the Citi Bike member joined a partnering Community Development Credit Union after Citi Bike launched and, in doing so, received from credit union staff a code to purchase a discounted Citi Bike membership.

NYC Bike Share also provided a list of 332 Citi Bike station names and their corresponding ZIP codes, which allowed us to add two new columns to the Excel data files: start station ZIP code and end station ZIP code. With this information we were able to analyze trips by neighborhood, rather than simply on an individual station level.

Data Cleaning

We first consolidated the three Excel files (June, July, and August 2014) into one dataset, which we uploaded into SPSS version 22. For ease of analysis, we recoded text variables into numerical variables, such as user type (Subscriber/annual member=1, Customer/casual user=0) and discount type (general member=0, NYCHA/CDCU=1, and CDCU New Member=2). We then created a new dichotomous variable that would allow us

to compare all general members (0) with all discounted members (NYCHA/CDCU and CDCU New Members=1). We recoded the variable birth year into age groups, allowing for easier comparison to existing data. The new variable grouped Citi Bike riders into the following age brackets: 16-24, 25-44, 45-64, 65+, which is the default age categorization used by the NYC Department of Health and Mental Hygiene.

Based on start station ZIP code and end station ZIP code variables, we added two new variables identifying the poverty level of each trip's start and end station locations (high poverty=1, low poverty=0) and whether start and end stations were located in neighborhoods that included at least one NYCHA development (NYCHA=1, no NYCHA=0). High poverty ZIP codes were selected from a list developed by the United Hospital Fund, and included Bedford-Stuyvesant (11216, 11221) and Williamsburg, Brooklyn (11211); and Chinatown (10002) and the Lower East Side (10009) in Manhattan.[25] We gathered from the NYCHA website those New York City ZIP codes that contain at least one public housing development, included: Downtown Brooklyn (11021), Fort Greene (11205), Bedford-Stuyvesant (11216, 11221), Williamsburg (11211), and Boerum Hill, Brooklyn (11217); as well as the Lower East Side/Chinatown (10002), East Village (10009), and Chelsea (10011, 10001) in Manhattan.

Using the SPSS Date and Time Wizard, we transformed the start and end time variables, which originally included both date and time consolidated in one variable, into multiple variables: start month, start day, start hour, end month, end day, and end hour. Further, we created a new variable that identified any trip that started from 7am-10am or 5pm-7pm on a Monday, Tuesday, Wednesday, Thursday, or Friday, which we labeled as a

"weekday commute time" trip. A trip that started any other time, including on the weekend, we labeled as being taken "outside commute time."

Analysis included descriptive statistics to examine the characteristics of general and discounted members and their trips. We used cross-tabulations to compare members' characteristics and trips.

RESULTS

Sample

From June 1, 2014 through August 31, 2014, Citi Bike riders took a total of 2,871,545 trips. During those three months, annual members took 2,497,653 trips (87%) and casual users, who purchased 24-hour or 7-day Citi Bike passes, took 373,892 trips (13%). Because Citi Bike's equity initiative applies to annual members only, we eliminated from the dataset any trips taken by casual users. This resulted in 2,497,653 trips to analyze, taken only by full-price and discounted annual members.

Of those trips, we considered 3,100 (.1%) to be "unrealistic," and eliminated them from the dataset. "Unrealistic" trips lasted under 60 seconds or over three hours. A trip lasting under 60 seconds likely represents a user releasing and immediately re-docking a bike, not taking an actual trip. A trip lasting over three hours likely represents a bike that was not properly docked after a shorter trip, or a bike that was lost or stolen. That brought the "realistic" annual member trip total to 2,494,553, which became our dataset for analysis moving forward. [TABLE 1]

Discounted Member Population

Of all realistic trips taken by annual members, about 76% were taken by men and 24% by women. Compared to general member trips, women took a higher proportion of

discounted member trips, though men still took the majority of trips. Among discounted members, women took 32.4% of all trips – nearly 1/3 of discounted members' trips. Among general members, women took 23.8% of trips – less than 1/4 of all general members' trips. [TABLE 2]

Overall, most Citi Bike trips were taken by 24-44 year-olds (66.3%) and 45-64 year-olds (24.7%). But, when comparing general and discounted members, the proportion of trips taken by each age group varies slightly. Among general members, 25-44 year-olds took 66.4% of trips. But, among discounted members, 25-44 year-olds took only 52.7% of trips – 13.7% fewer. Older people made up much of that difference: 45-64 year-olds took 24.6% of general members' trips, but 35.3% of discounted members' – 10.7% more. And while those age 65 or older took 1.5% of general member trips, among discounted members they took nearly twice that – 2.9%. Also, the proportion of trips taken by Citi Bike's youngest members varied slightly between general and discounted members. While16-24 year-olds took 7.6% of general member trips, they took 9% of discounted member trips – 1.6% more. [TABLE 3]

Among women in particular, older riders took a higher proportion of discounted member trips compared to general member trips. Women under 45 took 77.6% of all trips taken by general member women, but only 54.3% of all trips taken by discounted member women – a difference of 23.3%. Women age 45-64 took 21.4% of general member women's trips, but 40.6% of discounted member women's trips – 19.2% more. The oldest age group, women age 65 or older, took .9% of all trips taken by general member women, but 5.1% of all trips taken by discounted member women – more than five times as many.

Discounted Member Trips

Discounted members took 15,427 trips in June, July, and August 2014, .6% of all Citi Cike trips taken during that period. Overall, most Citi Bike riders used the system on weekdays. In June, July, and August, 77.5% of general members' trips and 74.8% of discounted members' trips were taken on a weekday (Monday through Friday). Citi Bike trips are usually short; general members' trips were slightly shorter than discounted members' trips during summer 2014. The mean trip length was 12 minutes 53 seconds (772.86 seconds) among general members and 13 minutes 21 seconds (801.35 seconds) among discounted members, a difference of only 28 seconds. The median trip length was 10 minutes 13 seconds (613 seconds) among general members and 10 minutes 53 seconds (653 seconds) among discounted members, a difference of 40 seconds. [TABLE 4] Discounted members took a higher proportion of trips outside the "weekday commute time" (65.1% compared to 58.2%). [TABLE 5] No difference in average trip duration appears when comparing trips that started during and outside weekday commute times.

Almost all trips taken from June through August 2014 started and ended at different Citi Bike stations; hardly any trips started and ended at the same station. Among general members, only 2% of trips started and ended at the same station. Among discounted members the number was only slightly higher at 2.8%. Trips that start and end at the same station are generally thought to be recreational trips, taken for exercise or pleasure, but not for transportation. Among trips taken by women, discounted members took a higher proportion of trips that started and ended at the same station than general members (3.6% compared to 2.3%).

A higher proportion of discounted member trips than general member trips started

in a ZIP code that includes at least one NYCHA development (51.1% compared to 29.9%). [TABLE 6] Among women, a higher proportion of discounted members' trips started in a ZIP code that includes at least one NYCHA development (55.8% compared to 31.5%). Overall, 38.8% of all trips taken by discounted members started in a high poverty neighborhood, while only 11.1% of trips taken by general members did. [TABLE 7] No matter the day of the week, a higher proportion of trips taken by discounted members started in a high poverty neighborhood – 36.8% on weekdays (compared to 10.2% by general members) and 44.6% (compared to 14.5% by general members) on weekends. (High poverty neighborhoods are determined by the United Hospital Fund codes and include Bedford-Stuyvesant, Williamsburg, Chinatown, and the Lower East Side.)

Conclusion

Main Findings

This study examined the characteristics of 15,427 trips taken by discounted Citi Bike members during three months of operation in 2014, and compared them to those of nearly 2.5 million trips taken by general members over the same period. We found that discounted members took close to but fewer trips than expected, taking .6% of all trips while making up an estimated 1% of Citi Bike's entire annual member population. Overall, discounted member characteristics followed the same tendencies as general member characteristics in terms of gender and age: men age 25-44 took a higher proportion of Citi Bike trips than other groups, whether they gained access to Citi Bike through a full-price or discounted membership. Women and older people, though, took a higher proportion of discounted member trips than general member trips, particularly women age 45 and older. Trips taken by discounted members were similar in duration to those taken by general

members – short, were just as likely to be taken on a weekday, and were just as unlikely to start and end at the same Citi Bike station. A substantially higher proportion of discounted member trips started in a high poverty neighborhood or a ZIP code that contained at least one NYCHA development.

Discounted Member Population

The demographics of Citi Bike discounted members, according to the utilization data we analyzed, reflects the population from which discounted members are drawn – a population that leans more female and older than New York City's general population. According to 2010 U.S. census data, women made up 52.2% of New York City's population.[26] However, in 2011, the year from which the most recent housing data is available, 60% of NYCHA's 486,349 residents were women.[27] So, while women took 23.8% of all general members' Citi Bike trips during summer 2014, it makes sense that among discounted members – largely NYCHA residents, who are predominantly female – women took a higher proportion of Citi Bike trips (32.4%). Similarly, while 12.1% of New York City residents are age 65 or older, 13.5% of NYCHA residents fall into that age bracket.[26,27] Again, this slight difference appears in Citi Bike utilization data, which shows that members age 65 and older took 1.5% of general member trips, but 2.9% of discounted member trips. Finally, in NYC public housing, 23% of women are 45 years old or older (only 10% of men are). However, of all trips taken by female discounted members in summer 2014, 45.7% were taken by women age 45 and older, showing that older female discounted members are disproportionately active in the Citi Bike system.

Discounted Member Trips

Contrary to our hypothesis, Citi Bike discounted members' trips did not have the

characteristics of recreational bike trips or trips taken for leisure, e.g. longer trip duration, starting and ending at the same station, and starting outside traditional commute times. Instead, discounted members' trips were quite similar to general members' trips. Among both groups, median trip duration was just shy of 11 minutes, about 75% of trips were taken on weekdays, and only around 2% of trips started and ended at the same station. While discounted members did take a slightly higher proportion of trips outside the weekday commute time, discounted members appear to have used the Citi Bike system for transportation, rather than recreation or leisure. Additionally, the proportion of discounted members' trips that started in high poverty neighborhoods or those neighborhoods with at least one NYCHA development, which was substantially higher than the proportion of general members' trips that started in these areas, suggests that Citi Bike discounted members do, in fact, come from the populations NYC Bike Share intends to serve through its equity initiative.

Discussion

An analysis of three months of Citi Bike utilization data showed that discounted members – self-selected participants in Citi Bike's equity initiative – took only .6% of all Citi Bike trips in summer 2014. Without assessments of similar bike share equity initiatives implemented within the U.S. available, it is impossible to compare this number to other systems' efforts. However, it is clear that there is ample room for expansion of the Citi Bike discounted membership program, especially considering the large number of people eligible from within NYCHA, and, to a lesser extent, Community Development Credit Unions. We recommend that NYC Bike Share develop measurable goals for the growth of its equity initiative based on this initial analysis. Additionally, we recommend NYC Bike Share

encourage system operators across the country, many of which are owned by the same parent company, to adopt similar evaluation plans, standards and metrics.

Utilization data showed that during summer 2014 women took 23.8% of Citi Bike general member trips and 32.4% of discounted member trips, though in 2013 researchers from Hunter College observed that only 18% of New York City bicycle riders were female.[28] A number of studies have explored the reasons for low uptake of bicycling among women, citing reasons including complex travel patterns, having to make more child-serving trips, as well as concerns about traffic safety.[29,21,30] While not gender equitable, Citi Bike utilization appears to be *more* gender equitable than non-Citi Bike bicycle commuting in New York City, and *most* gender equitable among discounted members. This difference may be a reflection of overall population differences, where women make up a larger proportion of the NYCHA population, but it highlights the fact that despite personal barriers, gender-based responsibilities, and risk perceptions, there is some demand among low-income women for Citi Bike – particularly those women over the age of 45. Exploration of ways to further engage low-income women in this age bracket is warranted.

A report produced by the Mineta Institute at San Jose State University showed that of four major established bike sharing systems in the U.S. and Canada they examined, all catered disproportionately to the rich.[13] In all four cities, low-income cohorts represented a smaller share of the bike share member population than they were of the total city population, while high-income cohorts did just the opposite.[13] Nationally, though, those with annual incomes under $20,000 reported having ridden a personal bicycle most frequently in the last year, both for recreation and transportation.[9] Yglesias poses reasons for this discrepancy: personal bicycles are already relatively affordable and a thrifty travel

option for the poor, bike sharing systems are not reliable enough for low-wage shift workers, and bike share is an amenity that low-income families, who already spend a hefty amount on transit, find it easy to go without.[31] Yglesias described bike sharing as a "high-end recreational amenity that people spend money on when they have money to spare."[31]

With this, we hypothesized that Citi Bike's discounted members would represent the few NYCHA residents and CDCU members who could spare additional income for occasional recreational riding, and their trips would have the characteristics of recreational or leisure trips. However, analysis of Citi Bike utilization data showed that discounted members' trips were almost identical to trips taken by general members: short, taken on weekdays, and starting and ending at different stations (point-to-point). Despite the very small percentage of low-income individuals and people of color who report riding a bicycle for transportation in New York City, it appears that Citi Bike discounted members do, in fact, use the system for transportation rather than recreation.[32,17,33] In his research on deterrents to Citi Bike use among NYCHA residents, Stead found that the top reason residents cited for not having used the bike sharing program was that people were simply used to their routine.[24] We recommend NYC Bike Share offer NYCHA residents and low-income New Yorkers opportunities to try riding a Citi Bike specifically for transportation in order to understand the efficiency of bicycle commuting as well as how the system could fit into their current routine, benefitting them financially and physically.

Limitations

Because the dataset provided by NYC Bike Share did not include unique identifiers for each trip, such as a Citi Bike user ID number, it was impossible to tie trip data to a certain Citi Bike member or to gauge the frequency with which certain Citi Bike members

used the system. Neither could we determine how many separate individuals took these trips. The data provided does not tell us how many members used the system or how frequently they did so, but only the proportion of trips taken by general members and discounted members from June through August 2014.

The use of utilization data limited what could be studied, particularly the race/ethnicity of Citi Bike members, which is not included in Citi Bike utilization datasets. Because over 95% of NYCHA residents are people of color and select Community Development Credit Unions are located in low-income communities consisting predominantly of people of color, discounted membership was used as a proxy for race/ethnicity. In addition, as Citi Bike annual member keys can be passed between individuals, it is likely that a small number of trips were made by individuals with different demographic profiles to those who registered. Finally, having data for only a three month period meant it was not possible to study temporal trends, particularly as usage levels are likely to be highly affected by the seasons, and may impact general and discounted members' use of the system differently.

Utility

Many low-income individuals, women, and people of color, who make up the vast majority of NYC public housing residents, are insufficiently physically active and overweight or obese, suffering disproportionately from related conditions. [27,32,34] Simultaneously, while low-income households have been found to have slightly shorter commute distances, they still spend significantly more time commuting than their non-poor counterparts, thanks to slower speeds on public transit.[35] Active transportation has the potential to provide much-needed physical activity while offering an efficient

transportation option to those who could most benefit from both. Bike share can help achieve health and transportation equity, but first must effectively address its own inequity.

Some bike share system operators admit that planning or implementing programs to address equity is premature, as they are squarely focused on establishing functional systems that don't lose money, as they often do.[17,36] By better understanding those underserved populations who select to use a bike sharing system, and how they actually use the system, we believe that bike share operators will be able to more efficiently apply their limited resources to implement and expand effective equity initiatives. Additionally, this study will contribute to a limited body of literature on active transportation habits of low-income groups, and to a small but growing body of literature related to bike sharing, a rapidly expanding industry.

Appendix

Figure 1

NYCHA Campuses Within 1/4 Mile of a Citi Bike Station



Over 20 NYC Housing Authority developments are within one-quarter mile (five city blocks) of a Citi Bike station. (Stead, 2015)

Table 1

Realistic Trips Taken by General vs. Discounted Members Jun-Aug 2014

Member Type	Trips	Percent	Valid Percent	Cumulative Percent
General Members	2479126	99.4	99.4	99.4
Discounted Members	15427	.6	.6	100.0
Total	2494553	100.0	100.0	

Table 2

General and Discounted Member Trips by Gender Jun-Aug 2014

Gender		General Member Trips	Discounted Member Trips	Total
Female	Count	590,597	5,002	595,599
	% within member type	23.8%	32.4%	23.9%
Male	Count	1,887,672	10,425	1,898,097
	% within member type	76.2%	67.6%	76.1%
Total	Count	2,478,269	15,427	2,493,696*
	% within member type	100.0%	100.0%	100.0%

*857 cases were missing gender information, which is why this does not total to 2,494,553 trips.

Table 3

General and Discounted Member Trips by Age Group Jun-Aug 2014

Age		General Member Trips	Discounted Member Trips	Total
16-24	Count	187,423	1,394	188,817
	% within age groups	93.3%	.7%	100.0%
	% within member type	7.6%	9.0%	7.6%
25-44	Count	1,644,972	8,130	1,653,102
	% within age groups	99.5%	.5%	100.0%
	% within member type	66.4%	52.7%	66.3%
45-64	Count	609,722	5,448	615,170
	% within age groups	99.1%	.9%	100.0%
	% within member type	24.6%	35.3%	24.7%
65+	Count	36,981	455	37,436
	% within age groups	98.8%	1.2%	100.0%
	% within member type	1.5%	2.9%	1.5%
Total	Count	2,479,126	15,427	2,494,553
	% within age groups	99.4%	.6%	100.0%
	% within member type	100.0%	100.0%	100.0%

Table 4

Average Trip Duration Jun-Aug 2014 (trip duration measured in seconds)

Average Trip Duration	General Member Trips	Discounted Member Trips
Number of Trips	2,479,126	15,427
Mean	772.86	801.35
Median	613.00	653.00
Standard Deviation	598.033	615.232
Range	10739	10646

Table 5

Trips Taken During Weekday Commute Time by General vs. Discounted Members Jun-Aug 2014

Trips Taken During Weekday Commute Time	General Member Trips	Discounted Member Trips
Frequency	1,037,411	5,384
Percent	41.8%	34.9%
Valid Percent	41.8%	34.9%

A trip that started between 7am-10am or 5pm-7pm on a Monday-Friday was considered a "weekday commute time" trip.

Table 6

Trips Starting in NYCHA ZIP Code by General vs. Discounted Members Jun-Aug 2014

NYCHA Start		General Member Trips	Discounted Member Trips	Total
No	Count	1,738,694	7,541	1,746,235
	% within member type	70.1%	48.9%	70.0%
Yes	Count	740,432	7,886	748,318
	% within member type	29.9%	51.1%	30.0%
Total	Count	2,479,126	15,427	2,494,553
	% within member type	100.0%	100.0%	100.0%

Table 7

Trips Starting in High Poverty Neighborhood by General vs. Discounted Members
Jun-Aug 2014

Poverty Start		General Member Trips	Discounted Member Trips	Total
Low	Count	2,202,734	9,449	2,212,183
	% within member type	88.9%	61.2%	88.7%
High	Count	276,396	5,978	282,370
	% within member type	11.1%	38.8%	11.3%
Total	Count	2,479,126	15,427	2,494,553
	% within member type	100.0%	100.0%	100.0%

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Evaluation Criteria for the Capstone RESEARCH Paper

Student ____ _____ **Faculty reviewer**____**Lorna Thorpe**_____ **Date_12/06/2011**____

Title _____ **Self-reported bedbug infestation among NYC residents: prevalence and risk factors, 2009**

Evaluation criteria	Completely	Substantially	Partially	Not at all	N/A	Comments
1. Provided a structured **Abstract**	x					
2. a. Included an **Introductory** section	x					
b. Described the **Scope** of the problem & its PH **Significance**	x					
c. Summarized relevant scientific knowledge and policies		x				
d. Identified relevant scientific and policy gaps	x					
e. Provided a clear rationale for the project	x					
f. Summarized what will be covered in the paper (specific aims)	x					
3. Provided a clear description of research conducted	x					
a. Articulated student role in research or data collection					x	
4. Described the **Methods** and **Processes** including: a. Sites and sample	x					
b. Information collection procedures and measures	x					
c. Relevant data management & analytic techniques, summarized & analyzed	x					
5. Presented research **Results/Outcomes**. For example:						
a. Provided a description of the sample and relevant characteristics	x					
b. Presented information on relevant risk factors and/or outcomes	x					
c. Presented comparison data for study subgroups, as appropriate	x					
d. Presented clearly labeled graphs, figures, or diagrams		x				
e. Correctly used & interpreted appropriate measures and/or statistical	x					

Evaluation criteria	Completely	Substantially	Partially	Not at all	N/A	Comments
tests						
6. **Discussion**						
a. Analysis and synthesis of results	x					
b. Interpretation of results in context of previous literature		x				
c. Summarized strengths and limitations of study		x				
d. Provided recommendations and a conclusion/take home message	x					
7. Paper **Organization**						
a. Followed the correct format (subheadings, length, margins, spacing)	x					
b. Cited ≥ 12 references, including ≥6 peer-reviewed sources	x					
c. Provided complete references, using AJPH format	x					
d. Attributed all statements of fact to their source	x					
e. Used correct spelling and grammar	x					
8. Paper **Style**						
a. Organized ideas within & between paragraphs in a clear & logical fashion		x				
b. Paper flow and readability	x					
c. Scientific writing	x					

Rev 3/18/09, 7/18/09, 11/08/09

Action to be taken, please check one:

___This paper is acceptable with no revisions.

_X__This paper should be acceptable once the author makes the indicated revisions.

___This paper should be acceptable once the author makes the major revisions indicated

___This paper is unacceptable.

Reason for above choice:

Comments for NAME REDACTED paper on bedbugs:

– I had a great time reading this draft of the paper. I found it to be much more organized and clear, and I can see a lot of work went into this current version. You are well on your way to having a publishable article! See my comments below. These are the main comments I would like you to address in the response to reviewers.

Abstract –

The abstract is generally good, but more detail is needed in Methods regarding size of sample, the fact that it is a survey of adult residents, clarification regarding what you examined (risk factors for infestation; range of potential health outcomes); and statistical methods used (logistic regression).

In conclusion, the first sentence conclusion is not sufficiently apparent to readers. What supports apt-to-apt travel, and what supports hitchhiking?

Introduction –

Generally, a nicely written section. I find the placement of mental stress before physical health (where more is published) to be odd and would recommend switching the paragraphs. See one other minor comment in tracked changes document.

Methods –

Good section! Mostly very minor edits. I had two questions for you to consider and one possible re-wording suggestion.

Questions:

(1) The question pertains to new diagnoses of asthma (see notes). Do you think it is worthwhile to retain, given the extremely rare occurrence of new-onset asthma among adults? Might the issue of "genesis" of asthma be better studied among children? I do agree with the inclusion of ever diagnosed and ED visits – to examine asthma exacerbations.
(2) After reading your Methods section, I don't expect to see health variables (such as depression, first diagnosis of depression, NSPD, etc) as predictors of bedbug infestation, yet they show up in table 1. Either explain that you are also examining health predictors or take out (which is my recommendation). In particular, the rationale for looking at first occurrence of depression as a predictor of bedbug infestation is not clear to me.

Re-wording suggestion:

I suggest you re-word the section on why you forced the age and number of household members into the final model.

Results –

In paragraph about fully-adjusted model, it may be worth pointing out in a sentence which associations were no longer apparent after SES and other adjustments. I think this is particularly noteworthy for race/ethnicity and number of children in the HH.

Discussion –

Excellent re-write! I think the structure of the discussion is now quite good. I have some edit suggestions for clarity and I suggest you try and reduce the total length of the limitations section (currently 5 paragraphs) and perhaps organize it by design issues (i.e temporality), measurement issues (bit sensitivity, unmeasured variables, residual confounding), and perhaps only a brief mention of external validity.

Evaluation Criteria for the Capstone RESEARCH Paper

Student ___Faculty reviewer____Heidi Jones_____ Date_12/07/2011____

Title _____ Self-reported bedbug infestation among NYC residents: prevalence and risk factors, 2009

Evaluation criteria	Completely	Substantially	Partially	Not at all	N/A	Comments
5. Provided a structured **Abstract**	x					
6. a. Included an **Introductory** section	x					
b. Described the **Scope** of the problem & its PH **Significance**	x					
c. Summarized relevant scientific knowledge and policies	x					
d. Identified relevant scientific and policy gaps	x					
e. Provided a clear rationale for the project	x					
f. Summarized what will be covered in the paper (specific aims)	x					
7. Provided a clear description of research conducted	x					
a. Articulated student role in research or data collection					x	
8. Described the **Methods** and **Processes** including: a. Sites and sample		x				Add the sample size
b. Information collection procedures and measures	x					
c. Relevant data management & analytic techniques, summarized & analyzed	x					
5. Presented research **Results/Outcomes**. For example:						
a. Provided a description of the sample and relevant characteristics	x					
b. Presented information on relevant risk factors and/or outcomes	x					
c. Presented comparison data for study subgroups, as appropriate	x					
d. Presented clearly labeled graphs, figures, or diagrams	x					
e. Correctly used & interpreted appropriate measures and/or statistical tests	x					
6. **Discussion**						

Evaluation criteria	Completely	Substantially	Partially	Not at all	N/A	Comments
a. Analysis and synthesis of results	x					
b. Interpretation of results in context of previous literature		x				
c. Summarized strengths and limitations of study		x				I also think the limitations section is a bit long and does not have a clear logical order.
d. Provided recommendations and a conclusion/take home message	x					
7. Paper **Organization**						
a. Followed the correct format (subheadings, length, margins, spacing)	x					
b. Cited ≥ 12 references, including ≥6 peer-reviewed sources	x					
c. Provided complete references, using AJPH format	x					
d. Attributed all statements of fact to their source	x					
e. Used correct spelling and grammar	x					
8. Paper **Style**						
a. Organized ideas within & between paragraphs in a clear & logical fashion		x				
b. Paper flow and readability	x					
c. Scientific writing	x					

Rev 3/18/09, 7/18/09, 11/08/09

Action to be taken, please check one:

___This paper is acceptable with no revisions.

_X__This paper should be acceptable once the author makes the indicated revisions.

___This paper should be acceptable once the author makes the major revisions indicated

___This paper is unacceptable.

Reason for above choice:

, you have done a great job. My main comments (as also found embedded in the document itself) are:

1. I would reorder the introduction to match the analysis – so prevalence, risk factors, health outcomes, why our study.

2. I (also) think that the health outcomes should not be included as predictors, so should not be in Table 1 or 2.

3. I think alcohol drinking should be thought of as a predictor rather than a health outcome (perhaps – although could also consider dropping it) – I thought it was meant to counterbalance the findings with sugar sweetened beverages?

4. You need to add the sample size to the abstract and to the methods section.

5. The limitations section should be shortened to may be 2 paragraphs with a clear order of limitations – probably related to first prevalence estimate, second predictors, third health outcomes to match the flow of the paper. It might also be worthwhile to add a short paragraph about the strengths of this study (generally like to include both strengths and limitations in the discussion section).

All in all – you've done a great job! - Heidi

Self-reported bedbug infestation among New York City residents: prevalence and risk factors, 2009

Dear

You have a lot of great work done here already. I think most of your analyses are quite good – with a few minor exceptions that I point out in the body of the paper. What I see the paper needs now is some re-organization and re-crafting of text to simplify concepts and language, being more systematic is laying out thought processes and measures, and cutting back on talking beyond your what your data can tell you.

As the next version is your "final" version, you also need to make some simple structural additions. Your final paper should have a title page (regular 12 point font title, your name, date, abstract and text word count, and target journal), an abstract page, and all tables should be at the end of the paper, not embedded in the middle of the text. Also, this particular draft is missing table 2 – a key table.

I second Lorna's comments. This paper has come a long way and you have clearly put a lot of work into it. Upon rereading the methods section, I agree with Lorna that it could still be tightened/reorganized. I like the idea of removing the mental health outcomes as predictors of bedbug infestations, and leaving these only as potential outcomes from bedbug infestations. This will then streamline how to present the methods, and will be easier for the reader to see the bigger picture. Then the methods, results and discussion sections can all go in the same order: 1. Prevalence 2. Predictors of bedbugs 3. Outcomes from bedbugs.

I also agree that you need to more carefully differentiate in the discussion section between conjecture and discussing how the results from this study compare with other studies.

Nice work!

HeidiBackground

Bedbug infestations, once a common problem worldwide, virtually disappeared in the

industrialized world after World War II. In the past 5-10 years, however, reports of bedbug

infestations in urban centers have risen precipitously, with many urban areas around the world reporting double digit increases.[1-3] Prevalence appears to be widely divergent both within the United States (U.S.) and globally, and bedbug complaints to New York City's (NYC) 311 telephone line began increasing sharply in the past decade, from 537 in 2003 to 1,839 in 2004, following a steep gradient to 10,985 in 2009.[4]

Health Consequences

To date, dermatological presentations and vector competency for transmitting infectious diseases have dominated research on health outcomes caused by bedbugs. Known health effects of bedbugs are primarily limited to dermatological bite reactions of blisters and rashes. Bites can itch, which may lead to secondary infection from scratching,[5] and in rare cases, anaphylactic shock.[6, 7] Skin disease and exacerbated skin conditions have frequently been linked to mental stress,[8, 9]. One study found that among households with bedbugs, residents reported experiencing mental health symptoms in relation to infestations, including: sleeplessness (29%), anxiety (20%), emotional distress (22%) and stress (14%).[10] These symptoms are also uniformly acknowledged among field practitioners and pest control professionals. Delusional infestations have been reported as both a purely psycho-social phenomenon and an immediate aftershock of cleared infestation.[11] Anecdotes of social ostracism – from job loss to dating barriers – have been noted in social networking outlets and other media.[12-14]

Commented [LT1]: From LORNA: You don't demonstrate "divergence", so to me this is a non-sequitor statement unless you either (1) show data from an urban center that had no increase or a smaller increase, or (2) change first clause of the sentence to not focus on divergence.

I also think it would help your paper overall if you added a sentence here about the difficulty of tracking trends due to reliance on imperfect administrative data, such as tel calls. That's what makes YOUR data source so unique.

From HEIDI: I agree with Lorna – would take out the divergent part of the sentence and conclude with a sentence about difficulty in measuring.

Commented [LT2]: From LORNA: Moved your last sentence up to front here –it felt repetitive and out of place at end – perhaps it works as a topic sentence instead.

From HEIDI – I agree with Lorna, had noticed this didn't fit earlier, feel it flows better this way.

Commented [LT3]: From LORNA: Because you can't substantiate this, particularly as phrased ("uniformly…"), I would delete. I also don't think it strengthens your paragraph, even if largely thought to be true (mind you, anecdote is highly valuable in hypothesis generation….it just doesn't work in peer review papers).

From HEIDI: Again, I agree with Lorna, had similar thoughts on this sentence .

Commented [LT4]: From LORNA: Awkward phrasing – "..Perceived infestations"? "…Imagined infestations"?

Commented [LT5]: From LORNA: This anecdote works because you have citations and you frame it as anecdote.

Unlike cockroach allergens, there is little evidence for an association between bedbug infestation and asthma onset or exacerbations,[15] although research has been limited. Bedbugs have also proven to be unlikely transmitters of infectious diseases, probably through a combination of minimal blood transfer during feeding and barriers to viral replication within the insect itself,[16-18]. Two possible exceptions may include Hepatitis B,[5] and recent hypothesis that bedbugs could serve as a reservoir for MRSA.[19]

Commented [NIR6]: I may not be right, but this MRSA thing seems much less established than Hep B, which at least has some investigation of transmission vehicle plausibility. MRSA was just found in bedbugs on folks with MRSA, and nothing was discussed about transmission in the paper, except that punctured skin might be vulnerable (not quite a bedbug transmission thing.) Am I reading the right article here? Anything I'm missing?

From LORNA: NO, seems right to me.

An indirect health impact of bedbug infestations may be the use of pesticides in bedbug control. Home extermination is one of the leading causes of pesticide exposure in urban settings.[20] Even relatively low doses of residential pesticides are associated with childhood leukemia[21] and with the exacerbation of conditions such as diabetes.[22] Further, these risks increase with cumulative exposure. In addition, bedbug hardiness in the face of extermination efforts may increase risk of pesticide misuse or over-use. Risk from bedbug extermination is already evident; 111 acute pesticide poisonings related to bedbug extermination were reported from 2002 to 2010 in the US as a whole, with more than half (58%) of these coming from NYC residents alone.[23]

Commented [NIR7]: Do I need to cite this?

Little is known about risk factors for bedbug infestation. Bedbug transmission has largely been assumed to happen via "hitchhiking" – the ability of bedbugs to sequester themselves on clothing or personal items, which are then moved by their owners to new locations. Human transfer may occur while visiting infested places outside the home, or residents may unwittingly

introduce bedbugs into their homes by acquiring infested furniture, clothing or toys.[24] Historically, research has suggested that low-income households have greater risk of other pest infestations (such as mice or cockroaches) due to overcrowding, poor housing stock, and implied housing management issues. More recently, field reports from one study proposed apartment-to-apartment bedbug travel via structural egress points such as hallways or electrical conduits.[24] Additional studies on determinants for building-level transmission would be useful in generalizing these findings.[25]

Given these hypothesized mechanisms for bedbug transmission, levels of social contact, differences in local travel and activity, and risk level of those in the subject's building or social network may also play a role. These risks may, in turn, depend on demographic or environmental factors, which are largely unexamined in relation to bedbug infestation. This investigation (1) estimated the prevalence of bedbug infestation using self-reported data from a community-based municipal survey conducted by New York's Department of Health and Mental Hygiene (NYC DOHMH) in 2009, (2) examined individual demographic and behavioral characteristics, household composition characteristics and building/neighborhood environmental characteristics as possible determinants of infestation, and (3) explored possible health outcomes of infestation.

Commented [NIR8]: Conduit is material, conduits is function. Will anyone know the difference or should I choose a different word – I want the material…

From LORNA: Not everyone will get it, but I think the terminology you select here is OK.

Commented [LT9]: I would delete this sentence – save such a recommendation for the Discussion.

From HEIDI: Again I agree with Lorna, had a similar reaction to this sentence the last time I read it.

Commented [LT10]: From LORNA: I suggest deleting these two sentences. Go straight into what you aim to show. The reader is going to struggle to track what you are listing and the conjectures you are making here in your attempt to be succinct. I don't think it adds much.

See how I suggest structuring the paragraph – you may not like the numbered approach (that's fine) but you should start to give the reader a sense of the 3 aims and the structure they will see throughout the rest of the paper…prevalence first, risk factors for infestation second, then health outcomes third. You can leave details of which health outcomes to Methods section.

Also, I think "…looked at" is too colloquial.

From HEIDI: I think these are good suggestions.

Methods

Data Source

The Community Health Survey (CHS) is an annual representative cross-sectional telephone survey of NYC adults aged 18 and older. This survey is administered by the NYC DOHMH and collects self-reported measures of health, behaviors and demographic characteristics using a neighborhood stratified random sample. Details of the study and sampling scheme are reported elsewhere.[26]

In this analysis, we used data from the 2009 CHS, which had approximately 125 questions. Responses were collected using a computer assisted telephone interview format. Interviews were conducted in English, Spanish, Russian or Chinese. Group residences, such as college dormitories, and homes of families with both landlines and cell phones were excluded. Among households agreeing to participate, one adult was selected at random to complete the survey, which took an average of 25 minutes to complete. The response rate was 34% for landline and 50% for cell phone, with a cooperation rate of 88% and 97%, respectively. The survey and method for gathering informed consent was approved by the DOHMH Institutional Review Board. The current analysis was deemed exempt from review by the CUNY Hunter College Institutional Review Board.

Measures

We used CHS responses to explore prevalence, predictors of self-reported bedbug infestation, and the extent to which bedbug infestation predicted key health outcomes. Bedbug infestation

Commented [LT11]: From LORNA: This section seems jumbled in its order. I suggest you follow the (1) prevalence, (2) risk factors for infestation, (3) health outcomes of infestation order. Save specificity of health outcomes until third paragraph because otherwise reader starts to nit-pik the selected list (why this, and not that) prematurely. You want them to wait until the designated section to think critically about this list.

From HEIDI: I think this is a good suggestion. I think this section is much clearer now, but it could still use some reorganization – I like the idea of listing these later.

was measured as a dichotomous response to: "During the past 12 months, have you had a problem with bedbugs in your home that required an exterminator?" In separate analyses, health outcomes examined included current depression, first diagnosis of depression in last 12 months, NSPD, heavy alcohol drinking, binge drinking, ever diagnosed with diabetes, ever diagnosed with asthma, diagnosed with asthma in the past 12 months, and asthma-related emergency department visits in the past 12 months. NSPD was determined by the standardized K6 scale. Diabetes, asthma and depression were determined by dichotomous answers to standardized questions modeled after the Behavioral Risk Factor Surveillance System for self-report of diagnosis by a health professional. (e.g., "Have you ever been told by a doctor, nurse or other health professional that you had *condition x*?"). Heavy alcohol drinking was defined as >2/day for men, >1/day for women, and binge drinking was defined as reporting 5 or more drinks on at least one occasion in the past 30 days.

Predictors of bedbug infestation explored included age (grouped 18-24, 25-44, 45-64, 65+ years), sex, race/ethnicity (white, black, Asian, Hispanic; "other" [n=175] was recoded as missing), nonemployment (combining homemaker, student and retired and unemployed/unable to work), education (less than high school, high school graduate, some college/technical school, college graduate), household poverty status (<200% of Federal Poverty Level [FPL] vs. >=200% of FPL), marital status (married/member of unmarried couple vs. divorced/widowed/separated/never married), country of nativity (U.S. vs. foreign born). Self-perceived health (excellent/very good/good vs.fair/poor) was included as a potential

Commented [LT12]: From LORNA: Put this paragraph after risk factors for infestation

Commented [LT13]: From LORNA: I suggest throughout your manuscript you address individual level, then household level, then neighborhood level characteristics, in that order.
BTW, marital status is individual level…it is not a direct measure of household make up, as you indicate in table 1 (a person could be married and not living together, or divorced and shacking up).

I also think you should not examine health status variables as predictors of bedbug infestation at all…too tangential in terms of plausible mechanisms and didn't really show anything useful, such as self-reported health, depression (all 3 measures) , alcohol use. I think it detracts from the elegance of your paper rather than adds to it.

Sex behavior is OK, and I will accept sugar-sweetened beverage drinking if you justify it more clearly in Methods section. These are all respondent-level.

Household level is total family size, HH income (decide if you want to refer to it as HH income or HH poverty and be consistent….and you do need to refer to it as "household" income throughout because it is not the respondent's income level but the HH level), total number of children, and number of children under 6. I am confused about whether you examined total number of children or not – you refer to it in text but not in tables. If you examined it, you need to add to Table 1.

Commented [LT14]: From LORNA: OK to add citation here instead of describing where cut-offs come from

mechanism for dermatological presentation, and for a potential confounder of infestation influence on mental health outcomes. Environmental predictors included neighborhood poverty levels (high, medium, low – based on tertiles of percent of residents living with incomes <200% FPL), and number of units in building (1-2 units, 3-9 units, 10-49 units and 50 or more units). Household makeup variables consisted of number of children by agegroup(?) (<6 years old, 6-12 years old, 13-17 years old), and total household size (recoded to 1, 2, 3 and 4 or more). Finally, we explored behavioral predictors: number of sex partners (0-1, two or more), and any recent physical activity ("During the past 30 days, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening or walking for exercise?"). We included number of children under six years old in the model as an opportunity to explore the possible mediating effect of the pest management regulation in grade schools compared with non-regulation of day care. As an exploratory measure, we also examined sugar sweetened beverage consumption (average consumed per day; none, less than one, one or more).

In models exploring the association between bedbug infestation and select health outcomes, we also examined insurance status (private, Medicare, Medicaid/Family Health Plus, other, uninsured) as a possible confounder of health outcomes through differentiated levels of diagnosis.

Commented [LT15]: From LORNA: Unclear text and mechanism – see my comment about dropping.

Commented [LT16]: From LORNA: Suggest dropping the sentence about neighborhood and indiv income not being correlated. Yes, you should look at that, but your data show that they each independently contribute information, so I don't think you need to state this to demonstrate indirectly that you assessed for collinearity.

Commented [LT17]: From LORNA: I am confused – did you look at both total number of children (if so, where are the data) AND number of children under 6 years old? I think you cannot be so specific here in Methods about your hope to use this variable to measure differences in pest mgmt. between school/institution settings. There are many possible ways a risk may be elevated in younger kids (day care, child care, sharing toys, greater propensity to use second hand furniture) and many ways it could be biased reporting (greater fear among parents of young kids) etc. Better to lay out what you look at here, and be a little more systematic in discussion about possible reasons for the observed association.

Commented [LT18]: From LORNA: In this instance, you need to articulate why….reader will be totally confused by addition of this one. I think this is a different issues than household composition, which doesn't need as detailed justification.

Data Analysis

Analyses in this study were performed using SAS version 9.2 (SAS Institute, Cary, NC). DOHMH-developed weighting strategies were applied to adjust for sampling methodology, adult telephone usage (landline only, landline and cell and cell only), and weight results to reflect age, gender and race distributions of neighborhoods (zipcode aggregations known as United Hospitalization Fund neighborhoods). To identify factors associated with bedbug infestation, covariates were individually analyzed in logistic regression using a chi-squared test. Those with significant p-values were included in a final multivariate logistic regression model aimed at identifying independent predictors of infestation.

Commented [LT19]: Cite NYC Housing vacancy survey here – no need to describe it)

Commented [LT20]: If you actually did not include some variables due to collinearity, describe your process at the end of this paragraph. How did you determine – be a little more specific.

To characterize potential health effects from bedbug infestation, we generated a separate model for each health outcome examined. Base models initially each had bedbugs as the only predictor. We then examined the influence of other covariates on this association to detect and adjust for potential confounding. Those covariates effecting a 10% change in the coefficient for the association between bedbug infestations and the health outcome were retained in the model. For highly collinear variables, we selected covariates for inclusion or exclusion based on relative strength and model fit.

Commented [CHC21]: The log odds that is the log odds of the outcome not really the predictor.

Commented [LT22]: Again, I don't exactly know what you mean by unique contribution, relative strength and model fit….I THINK you mean that you had to make some decisions on collinear variables , so this is how you did it. I suggest text changes – tell me if I changed the meaning of what you did.

Results

Prevalence and Distribution

In 2009, 6.7% (95% CI 5.9-7.5) of adults self-reported a bedbug infestation requiring an exterminator in the past year. (Table 1) By borough, Brooklyn had the highest level of

infestation (8.9%) and Staten Island the lowest (2.5%). The distribution of bedbug infestations showed an inverse relationship with age of the respondent, ranging from 10.5% for those 18-24 years to 3.5% for those 65+. Hispanic residents had the greatest proportion of reported infestations (10.5%) and white residents had the lowest (3.8%, p=<0.01). Those with low household income (<= 200% of FPL) had significantly higher reported infestations compared with those with higher income, and this negative association pattern was consistent with two other measure of socioeconomic status: education (12.4% less than high school through 4.5% for college graduate, p<0.01), and neighborhood poverty levels (10.9% for high poverty neighborhoods and 3.2% for low poverty neighborhoods, p<0.01).

Overall, rrespondents with children under 18 years of age reported bedbugs more often than those without children, with an observed positive gradient of association based on number of children. When children were categorized by age, the gradient for number of children was stronger among younger ages. Likewise, prevalence of infestation increased with the number of adults and total size of household showed a positive gradient with infestations. Whle not statistically significant, respondents reporting having no or one sexual partner appeared to have fewer infestations than those having two or more (6.7% versus 10.5%, p…). The differences in infestations among those with any measures of asthma were not significant. Those who scored positive for NSPD had higher levels of infestation (13.2% with positive scores versus 6.3% who did not score positive), as did those with diagnosed depression (9.4% with any diagnosed depression versus 6.3% with no diagnosis) although depression lacked statistical

Commented [LT23]: From LORNA: Not shown….

Commented [LT24]: From LORNA: Did you look at this?

significance. A positive gradient of bedbug infestation was evident for those consuming sugar-sweetened beverages (4.5% for none, 6.9% for less than one per day, and 9.7% for one or more) and for physical inactivity in the past month (8.9% for those who were inactive versus 5.9% for those who were active).

Commented [LT25]: From LORNA: Suggest dropping.

From HEIDI: I agree with Lorna about dropping the mental health stuff as predictors – it confuses the paper, I like it better with these just as outcomes, but don't think you need to drop the sugar beverages.

Table 1 - Bedbug Prevalence by Socio-Demographics, Health

	Total N (not wtd)	Total %	95% CI
Total Reported Bedbug Infestation	**558**	**6.7**	**5.9-7.5**
Demographics			
Age			
18-24	42	10.5	6.8-14.3
25-44	202	7.7	6.3-9.1
45-64	210	5.3	4.2-6.4
65+	101	3.5	2.7-4.4
Sex			
Males	211	6.6	5.3-7.9
Females	347	6.7	5.7-7.8
Race			
White, Non-Hispanic	144	3.8	2.9-4.7
Black, Non-Hispanic	146	7.4	5.5-9.3
Hispanic	221	10.9	8.8-12.9
Asian	39	6.2	3.5-8.9
Poverty Levels			
<=200% Federal Poverty Level	323	12.0	10.1-13.9
> 200% Federal Poverty Level	157	3.6	2.8-4.5
Education (highest grade)			
Less than HS	143	12.4	9.4-15.3
Grade 12/GED	145	7.5	5.6-9.3
Some College	121	6.7	4.9-8.4
College Graduate	145	4.5	3.4-5.6
US Born (yes)	266	5.3	4.3-6.4
No	285	8.5	7.1-9.9
Environmental			
Neighborhood Poverty Status			
High Poverty	272	10.9	8.9-12.9
Med Poverty	186	5.8	4.6-7.0
Low Poverty	95	3.2	2.2-4.2
Units in Building			
1-2	86	3.4	2.4-4.5
3-9	118	9.8	7.3-12.2
10-49	151	8.8	6.7-11.0
50 or More	163	6.3	4.8-7.8

Continued

Table 1 - Bedbug Prevalence by Socio-Demographics, Health, Continued

	Total (not wtd)	Total %	95% CI
Borough			
Bronx	106	8.1	5.8-10.3
Brooklyn	186	8.9	7.1-10.8
Manhattan	129	5.8	4.0-7.6
Queens	113	5.0	3.8-6.3
SI	24	2.5	1.3-3.7
Household Makeup			
Marital Status			
Married/Member of Unmarried Couple	216	6.5	5.4-7.7
Divorced/Separated/Widowed/Never Marrried	336	6.9	5.7-8.1
Children <6yrs			
None	442	5.7	4.9-6.6
One	74	8.8	6.0-11.7
Two or More	40	13.1	8.4-17.8
Household Size			
One	170	4.7	3.4-6.0
Two	118	4.5	3.4-5.7
Three	97	6.0	4.3-7.7
Four or more	173	10.3	8.3-12.2
Health			
Excellent/Very Good/Good	360	6.2	5.2-7.1
Fair/Poor	192	8.9	6.9-10.9
Ever Told Depression (yes)	137	9.4	7.0-11.8
no	418	6.3	5.4-7.2
First Told Depression in last 12 months (yes)	55	9.7	6.0-13.5
no	500	6.6	5.7-7.4
NSPD (yes)	70	13.2	8.9-17.5
no	482	6.3	5.5-7.2

Continued

Table 1 - Bedbug Prevalence by Socio-Demographics, Health, Continued

	Total (not wtd)	Total %	95% CI
Behaviors			
Heavy Alcohol Drinker (yes)	22	6.2	2.3-10.2
no	523	6.6	5.8-7.4
Binge Alcohol Drinker (yes)	74	7.3	5.0-9.6
no	479	6.6	5.7-7.5
Sugarsweetened Beverage Consumption			
None	200	4.0	3.2-4.9
Less than One	148	6.9	5.3-8.5
One or More	201	9.7	7.8-11.5
Active in Past 30 Days Outside Work	346	5.9	5.0-6.7
no	211	8.9	7.1-10.8
Number of Sexual Partners			
None or One	441	6.7	5.7-7.6
Two or more	64	10.5	7.1-13.9

Predictors of Bedbug Infestation

In the final adjusted model containing factors significant in bivariate analysis, only younger age of respondent (18-24 compared to 65+, adjusted odds ratio [AOR] 2.1; 25-44 AOR 1.7), household income below FPL (AOR 2.7), household size of four or more compared with one (AOR 1.7), and high neighborhood poverty (AOR 1.8) were significant positive predictors of bedbug infestation. Living in a 1-2 units in building compared with 50 units or more was protective (AOR 0.4), compared to living in a building with 50 or more units. Sugar-sweetened beverages, however, retained the same odds ratio as in the bivariate model, with marginally wider confidence intervals (AOR 1.8, 95% CI 1.2-2.6), with only the associations in age categories attenuated. On further investigation, among age group 25-44, distribution for sugar-

Commented [W26]: If comparing 1-2 units, all are significant, but it's really the 1-2 units that's the outlier. The rest are basically the same. Is that what you mean? Making 1-2 units the referent? I think maybe we discussed this with the adjacency discussion, but maybe I'm not understanding what you mean.

sweetened beverage consumption categories were relatively equal (none 32.0%, one or less 31.0%, and one or more 36.1%), and stratifying the model for this age group yielded AOR 3.0 (95% CI 1.5-6.0) for less than one daily and AOR 4.1 (95% CI 2.1-8.0) for one or more daily versus none for sugar-sweetened beverage consumption as a predictor for bedbug infestation.

Commented [LT27]: From LORNA: I could not follow this. I see you are trying to establish a dose-response, which I applaud. I am suspect, however that there is such a big OR for less than one daily compared to none. Why did you restrict this to 25-44 year olds? If you do keep this, I suggest you make it a separate paragraph and be explicit that this was done in a separate analysis (not in the model).

From HEIDI: Perhaps you should make it clearer that age was highly associated with drinking sugar drinks in the younger and older age groups, so you restricted the analysis to the middle age group that had more variability.

Potential Health Outcomes of Bedbug Infestation

Only NSPD, and diagnosed depression had significant associations with bedbugs in unadjusted models, but neither of these associations was significant in the final adjusted models (Table 3). Asthma as an outcome did not appear to be associated with bedbug infestation (OR 0.9, 95% CI 0.6-1.5), nor did emergency visit for asthma in the past 12 months (OR 1.5, 95% CI, 0.6-4.3), although only 33 cases reported an emergency visit for asthma.

Table 3 - NSPD and Depression by Bedbug Infestation, Controlling for Potential Co

	NSPD				Depression Ever			
	Crude		Model 1		Crude		Model 1	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Bedbugs (yes vs. no)	**2.2**	**1.5-3.4**	**1.5**	**0.94-2.4**	**1.6**	**1.1-2.1**	**1.4**	**0.96-2.0**
Age								
18-24	0.8	0.4-1.6			0.5	0.3-0.8	1.3	0.7-2.4
25-44	1.1	0.8-1.5			0.9	0.7-1.1	2.6	1.9-3.7
45-64	1.3	1.0-1.8			1.4	1.1-1.7	2.8	2.1-3.8
65+	1.0							
Race								
White, Non-Hispanic	1.0							
Black, Non-Hispanic	1.1	0.7-1.6			0.5	0.4-0.6	0.4	0.3-0.5
Hispanic	1.7	1.2-2.3			0.8	0.7-1.0	0.6	0.5-0.8
Asian	1.3	0.8-2.3			0.4	0.3-0.6	0.3	0.2-0.5
Poverty Status								
200% or more	1.0							
<200% FPL	3.1	2.2-4.3	1.8	1.1-2.9	1.3	1.1-1.6	1.1	0.9-1.4
Education (highest grade)								
College graduate	1.0							
Less than High School	2.9	2.0-4.2	1.1	0.7-1.8	1.2	0.9-1.5		
Grade 12/GED	1.5	1.0-2.2	0.8	0.5-1.3	0.9	0.7-1.1		
Some College	1.7	1.1-2.6	1.1	0.7-1.8	1.5	1.1-2.0		
US Born								
Yes	1.0							
No	1.2	0.9-1.6			0.6	0.5-0.8		
Neighborhood Poverty Status								
Low Poverty	1.0							
High Poverty	1.4	1.0-2.0			1.1	0.9-1.3		
Med Poverty	1.2	0.9-1.8			0.9	0.7-1.1		
Units in Building								
1-2	0.6	0.4-0.8			0.5	0.4-0.7		
3-9	1.1	0.8-1.7			0.8	0.6-1.0		
10-49	0.9	0.6-1.4			0.9	0.7-1.1		
50 or More	1.0							
Children <6yrs								
None								
One	0.9	0.6-1.4			0.8	0.6-1.1	0.9	0.6-1.2
Two or More	0.4	0.2-0.8			0.5	0.3-0.8	0.5	0.3-0.8
Household Size								
One								
Two	1.1	0.8-1.6			0.8	0.7-1.0		
Three	0.9	0.6-1.3			0.6	0.4-0.7		
Four or more	0.9	0.6-1.3			0.6	0.4-0.7		
Number of Sexual Partners								
None or One								
Two or more	1.5	0.9-2.3			1.3	1.0-1.7		

Continued

Commented [LT28]: Suggest you used "Unadjusted and Adjusted models as your headers, not Model 1 – because you don't have a Model 2…."

From HEIDI: I agree Adjusted is clearer, I would also spell out NSPD in the title.

Table 3 - NSPD and Depression by Bedbug Infestation, Controlling for Potential Confounders. Continued

	NSPD				Depression Ever			
	Crude		Model 1		Crude		Model 1	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Health								
Excellent/Very Good/Good								
Fair/Poor	4.2	3.2-5.5	3.1	2.2-4.3	2.7	2.3-3.2	2.3	1.9-2.9
Sugar-sweetened Beverage Consumption								
None								
Less than One	0.7	0.5-1.1			0.7	0.5-0.8	0.8	0.6-1.1
One or More	1.4	1.0-1.9			0.7	0.6-0.9	0.8	0.6-1.0
Physical Activity								
Not active	1.0							
Active in Past 30 Days	0.5	0.4-0.6			0.9	0.7-1.1		
Insurance type								
Medicaid/Family Health Plus	1.0							
Private	0.8	0.5-1.1	0.5	0.3-0.9	1.0	0.8-1.3	1.1	0.8-1.6
Medicare	0.6	0.3-1.4	0.7	0.4-1.0	0.6	0.4-0.9	0.5	0.3-0.9
Others	0.3	0.2-0.4	0.8	0.3-1.9	0.5	0.4-0.6	0.5	0.4-0.7
Uninsured	0.6	0.4-1.0	0.7	0.4-1.2	0.4	0.3-0.6	0.4	0.3-0.6

Discussion

This analysis is one of the first population-based studies to estimate reported bedbug infestation prevalence in an urban setting and to evaluate predictors associated with infestation. Our examination includes individual, household and environmental predictors, and provides a benchmark for future research on urban bedbug infestations. Risk factor data may be useful for preliminary testing of transmission theories and for comparison to other kinds of insect infestations to help us understand the dynamics and possible consequences of a changing entomological landscape.

Commented [LT29]: Stylistic comment: I prefer the first paragraph of a paper to give the main heading of what interesting findings you identified, and I would comment on the usefulness of this paper as a benchmark, etc in the final paragraphs, not right away. First I want to assure the reader knows what knowledge I am contributing before I say how important it is.

I think you could append the below paragraph to your first sentence and let this be paragraph 1.

Overall, we estimated that nearly one in fifteen NYC households reported a bedbug infestation in the past year in 2009, with a citywide prevalence of 6.7% and significant differentiation across the city's boroughs. In the adjusted model, factors associated with infestation included household and neighborhood poverty, echoing literature on risks of other insect infestations.[25] The number of units in the building was also a strong predictor. Adjusting for poverty (graded associations which remain robust) attenuated all individual respondent-level associations to insignificance with the exception of younger age. Other than household poverty level, total household size was the only other household level significant predictor. In adjusted models, bedbug infestations showed no significant association with any health or mental health outcome.

While reasons for some of the observed associations are not known, we can conjecture on potential mechanisms or potential biases that may account for our findings. At the individual

Commented [LT30]: From LORNA: I think you need some overarching statement that acknowledges that what you are about to conjecture upon is just that.

From HEIDI: I agree , generally a good idea to separate out conjecture/speculation from data driven by your study findings in the discussion

respondent level, aAge may be marker for social behaviors that increase bedbug hitchhiking, including …. Higher likelihood of reported infestation for younger ages may be measuring a range of cohort specific infestation risk associated with environmental, health, behavioral or cultural characteristics such as different housing, different diet, more travel or higher social contact. We should note, however, that associations with individual characteristics may also reflect dynamics of higher levels of reporting, rather than infestations, for example, younger age groups with greater media susceptibility, higher skin sensitivity, or differences in perception of stigma.

Behaviors or conditions within different households – e.g., crowding, children in daycare or schools, members frequenting community centers, collecting clutter – may also affect risk for bedbug infestation, and may complicate reporting by raising risks of other household pests. At the household level, the association with larger families, may indicate more aggregate social exposure and subsequent higher risk of introduction through hitchhiking.

Links to neighborhood poverty may be due to poor housing stock, greater crowding, or aggregation of other individual risks not accounted for in the model. In addition, once prevalence is elevated in a community, individual risks per social transaction may be elevated due to the higher background prevalence itself, thus perpetuating risks in these settings. Infestation levels may be related to less effective building management, which may be determined by the resources and recourse of tenants.[27] If points of egress (pipes or conduit)

Commented [LT31]: Not specific enough to be useful.

Suggest adding the borderline sex behavior results here too.

Commented [LT32]: From LORNA: Suggest deleting this first sentence too. Also unclear – Making too many jumps for the reader, and leaps too far in conjecture.

Try systematically addressing each of your findings in a more systematic way.

I would have 1 paragraph about the individual level findings, then one about

Commented [LT33]: From LORNA: I think you need to list all plausible reasons, not just poor housing stock. I wasn't very clear in my choice of text here but see if you find these suggestions helpful to work on.

between apartments above, below, or adjacent have not been sealed, bedbugs may be encouraged to travel within the building and between apartments. This transmission mechanism -- in larger buildings, and in poor housing stock in particular -- is supported here by the lower levels of infestation in 1-2 unit buildings. In these smaller buildings, introduction must come from outside or from only one adjacent apartment, which in turn would have introduction only from the outside. Apartments in larger buildings may also be more often subject to transfer from common areas, or from other building features that depend on unit count, increasing transmission risks for all apartments through within-building transmission. Regardless of common areas or building management, building characteristics associated with larger apartments may create some unseen risk factors for transmission, such as vertical adjacency to more rooms and apartments.Although unit count may correlate with a number of other risk factors such as income, household size and neighborhood and could thus reflect residual confounding, further examination of bedbug infestation by building type may identify structural risks and offer guidance in resource allocation for pest control.

[This paragraph feels incorrectly placed – should be in the health outcomes section. First you NEED to acknowledge the good news of no observed association with examined health outcomes before trying to raise alarm about something you did not look at.] These findings highlight other potential health issues that may result from infestation. Low-income tenants especially may not have control over extermination techniques, and may not have access to best management practices such as low-toxicity bedbug management. In low-income housing

where higher risk of other types of infestation already exist, new increased risk for bedbugs may augment the current disproportionate burden for low-income populations, particularly if there is a subsequent new higher risk of pesticide exposure. Families with children under six, while not at special risk, have a high burden in this sample, and young children are vulnerable to a vastly greater health impact from pesticide use. This group should come under special consideration as resources are allocated.

Our exploration of sugar-sweetened beverages deserves mentioning. The impact of sugar-sweetened beverage consumption on the 25-44 age range may be indirectly measuring social and behavioral differences; one could easily see, for instance, susceptibility to soda marketing as a correlate to susceptibility to influence of media in the reporting of bedbugs as an epidemic, which could lead to greater reporting. Nevertheless, it is worth noting that there is biological plausibility for the impact of sugar consumption on reporting and infestation levels.

Commented [LT34]: I suggest you have one paragraph on SSB only – shorten and combine.

In the existing research literature, there are indicators that diet, particularly sugar consumption, could plausibly have an effect on bite sensitivity and dermatological presentations. Sugar, carbohydrates and alcohol may have a complex connection to allergic reaction and inflammatory response, and may affect dermatological presentation.[28-30] Bedbugs seem to be attracted to carbon dioxide (CO_2),[31] which may increase in the exhaled breath of humans with high sugar consumption.[32] Further, sugar in blood meals have been associated with increased fecundity in a range of insects,[33] and could plausibly increase the

severity of infestation and speed of transmission within subgroups. Sugar-sweetened beverage consumption turned out to be surprisingly robust in the final bedbug infestation model. These findings warrant further investigation of potential links to inflammatory response and subsequent higher reporting, and of other biological factors that could account for higher infestations levels, such as an increased CO2 production after consumption or stimulated bedbug fertility with high-sugar blood meals.

Health and Mental Health Outcomes

Commented [LT35]: From LORNA: Suggest you don't use headers in Discussion. Not common, but depends on your target journal.

Bedbug infestation was not significantly associated with any health and mental health outcomes examined It is of particular interest that, unlike cockroaches[34], bedbugs showed no association with the asthma or asthma-related emergency department visits outcome. This may be due to limited study power to detect a small effect, fewer or different allergens for bedbugs, more prompt and definitive extermination from a higher perceived nuisance factor, or a number of pest control practice differences for bedbugs compared with other household pests, but there is little reason to assume there was an association to confound. In short, our findings do not support the suggestion in one study of possible associations found in a small sample [15].

Commented [LT36]: From LORNA: What does this mean?

Limitations

Commented [LT37]: Suggest no headers and should be in past tense.

This study is cross-sectional, which limits conclusions about temporal order. The primary outcome variable is reported infestations *in the past year*, however, and many covariates, such as education, poverty and children ages 13-17, likely predate infestation. Especially important

for health and mental health outcomes, infestations "in the past year" may represent ongoing infestations, and responses may miss those infestations that predate or were coincidental with health and mental health outcomes modeled here. Links to some health consequences may be more long-term than is possible to measure in this analysis: mental health outcomes may be latent; and any disease associated with pesticide use may depend both on the stage of cumulative exposure and on the latency for the disease in question. It is unlikely that this kind of delayed association could be measured against such a recent rise in infestations, or rise in bedbug-related exterminations. Other events, such as neighborhood media coverage of bedbug epidemics, may temporarily influence bedbug identification.[35]

Bite sensitivity may influence bedbug reporting, and population sensitivity prevalence is largely unknown.[36] Among those who react to bites, dermatological presentation varies, and may be delayed, making clinical diagnosis difficult. Sensitivity may increase with exposure, and, as a consequence, may change reporting in this population going forward. Bedbugs are small, hide during the day and have different appearance at different life stages, which may lead to resident misidentification, as is anecdotally reported by exterminators, and misidentification may be differential within a given population.[37]

Other factors may obscure true infestation prevalence, with potential negative reporting in subgroups due to stigma or increased or decreased reporting from pressing health concerns. For instance, parents may be more attuned to possible infestations than adults without

children. This survey asked about bedbug infestations which required an exterminator, and caution should be used in interpreting this prevalence as the level of infestation. An individual or building manager calling an exterminator could have a range of determinants yet to be quantified, such as cost as discussed above or nuisance. Some groups, such as immigrants from areas where bedbugs have a more recent history, may have experience managing bedbugs on their own, and others, such as asthmatics, may have lower tolerance for perceived risk or presence of infestation and exterminate prophylactically. Our findings on prevalence across demographic factors may help correlate infestations with other data sources, such NYC levels of complaints and building violations, as a preliminary step in establishing proxies for infestation.

Commented [LT38]: I suggest simplifying this section - - a little too detailed in conjecture.

In spite of the issues surrounding infestation self-report, psychological outcomes may not depend on correctly identifying infestations; in fact, the impact of the bedbug resurgence may best be described by self-report. Just as media may contribute to the population reporting, the stress conveyed on the population by increased level of infestations may have an impact distribution different from the aggregate of individuals experiencing actual bedbug infestations. It is also possible that self-report will prove to be an accurate marker of infestation levels as more information becomes available.

Lastly, NYC has a distinct and diverse profile, with a unique demographic makeup overall, and unusual concentrations of specific populations. Population density, immigration, relative financial stress and extermination costs may all have an impact on bedbug transmission,

reporting, and subsequent health outcomes. Local laws, state and local programs, and public education practice may affect prevalence and distribution (via introduction and transmission) of infestations and extermination. As relates to public health, other mental health outcomes, such as anxiety disorders not addressed by the NSPD survey questions, or delusional infestations, may be more closely associated with reported bedbug infestations, and the findings for the specific conditions analyzed should not be overgeneralized.

Commented [LT39]: True – but a bit too broad and vague. Make a key point, and focus on key points. Don't try to cover everything in single sentences.

Conclusions

Commented [LT40]: Good. If you are going to keep any hader – this might be the most useful.

Poverty-related factors seem to drive much of the differentiated prevalence in this sample. The cost of extermination may be a barrier to effective pest control in the population most at risk, and higher levels of infestation may exacerbate economic or health disparities. If not addressed thoroughly and systematically, disadvantaged residents and neighborhoods could create a reservoir of bedbug populations. Transmission mechanics may be multifactorial. Environmental risk factors suggest building level issues be investigated for interventions, and risk for younger ages and household size may reflect social contact and suggest community interventions as well as public education models. Determining differentials of reporting in future research may help rule out bite sensitivity as a confounder of infestation distribution and open the door to use of instrumental variables to measure bedbug prevalence. The association of bedbugs with consumption of sugar-sweetened beverages may be due to residual confounding by income or other factors, but the strength and robustness of the association and the biological plausibility of influence of dermatological presentation, bedbug attraction or bedbug fertility after feeding differentiation is speculative but may warrant further investigation.

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– Congratulations on a beautifully done paper. We have awarded you an "A" (total points: 96) on the basis of your thorough analysis, careful thinking about the problem, and quality of the write up. Our comments were all addressed, and your responses to us in the letter were appropriate. We encourage you to seek publication!

On this draft, I mainly provide critique on sections still needing a little work and try to point out strong sections. We can discuss possible track change suggestions later if you prefer. Congratulations again!

Self-reported bedbug infestation among New York City residents: prevalence and risk factors, 2009

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Abstract

Introduction

Since 2004, bedbug infestations have risen precipitously in urban areas. Although bedbugs have not been shown to transmit disease, bites may cause dermatological reactions and mental stress. Little is known about overall prevalence of and risk factors for infestations.

Methods

In the 2009 Community Health Survey of New York City (NYC), an annual cross-sectional, representative study of non-institutionalized adults, 9,934 participants reported on bedbug infestation requiring an exterminator in the past year. We used logistic regression to model infestation with demographic, behavioral and environmental factors, and to model health outcomes with bedbugs as a predictor adjusting for possible confounders.

Results

In 2009, 6.7% of individuals reported bedbug infestations. In a multivariable model, bedbug infestations were associated with age (18-24 and 25-44 vs. 65+ Adjusted Odds Ratio [AOR] 2.0, 95% Confidence Interval [CI], 1.4-2.9 and AOR 1.8, 95% CI 1.1-2.9, respectively), poverty (<200% Federal Poverty Level [FPL] vs. >=200% FPL, AOR 2.7, 95% CI 1.9-3.9), 3+ adults in household vs. 1 (AOR 1.6, 95% CI 1.1-2.4), and neighborhoods with highest poverty tertile vs. lowest (AOR

1.9, 95% CI 1.1-3.1). Living in buildings with <2 units vs. 50+ units was protective. Diabetes, asthma and depression were not associated with reported infestations.

Conclusions

Differences by individual, household, building and neighborhood characteristics support both bedbug hitchhiking and apartment-to-apartment travel. Exactly why risk is elevated among younger adults, low-income households and low-income communities is not well characterized.

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Commented [LET2]: This "wrap-up" still needs work. The hitchhiking vs apt-to apt travel assessment wasn't set up in the background, and results don't clearly demonstrate this without explanation. I don't think you'll be able to present this concept in the abstract successfully.

Introduction

Bedbug infestations, once a common problem worldwide, virtually disappeared in the industrialized world after World War II. In the past 5-10 years, however, reports of bedbug infestations in urban centers have risen precipitously, with many urban areas around the world reporting double-digit increases.[1, 2] The prevalence of bedbugs appears to be widely divergent in the United States (U.S.),[3] although investigations have largely used complaints to estimate burden on a population basis. Bedbug complaints to New York City's (NYC) 311 telephone line began increasing sharply in the past decade, from 537 in 2003 to 1,839 in 2004, following a steep gradient to 10,985 in 2009.[4]

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Little is known about risk factors for bedbug infestation. Bedbug transmission has largely been assumed to happen via "hitchhiking" – the ability of bedbugs to sequester themselves on clothing or personal items, which are then moved by their owners to new locations. Human transfer may occur while visiting infested places outside the home, or residents may unwittingly introduce bedbugs into their homes by acquiring infested furniture, clothing or toys.[5] Historically, research has suggested that building characteristics may present higher risk; low-income households may have greater risk of other pest infestations (such as mice or cockroaches) due to overcrowding, poor housing stock, and implied housing management issues.[6] More recently, field reports from one study proposed apartment-to-apartment bedbug travel via structural egress points such as hallways or electrical conduit.[5]

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The physical health impact of the apparent rise in infestations has yet to be determined. Known health effects of bedbugs are primarily limited to rare cases of anaphylactic shock,[7, 8] and dermatological bite reactions of blisters and rashes.[9, 10]. Bites can itch, which may lead to secondary infection from scratching.[11] Unlike cockroach allergens,[12] no association between bedbug infestation and asthma onset or exacerbations has been found,[13] although research has been limited. Bedbugs have also proven to be unlikely transmitters of most infectious diseases, probably through a combination of minimal blood transfer during feeding and barriers to viral replication within the insect itself.[14-16] Possible exceptions are Hepatitis B,[11] and the recent hypothesis that bedbugs could serve as a reservoir for Methicillin-resistant Staphylococcus aureus (MRSA).[17] To date, dermatological presentations and vector competency for transmitting infectious diseases have dominated research on health outcomes caused by bedbugs.

Bedbug infestations may cause mental stress. One study found that among 474 households with confirmed cases of bedbugs, residents reported experiencing mental health symptoms in relation to infestations, including: sleeplessness (29%), anxiety (20%), emotional distress (22%) and stress (14%).[18] Cases of delusional parasitosis have been reported both as a purely psycho-social phenomenon and an immediate aftershock of cleared infestation.[19] Bedbug related skin conditions may add to mental stress.[9, 10] Anecdotes of social ostracism – from job loss to dating barriers – have been noted in social networking outlets and other media.[20-22]

In this study, we used self-reported data from a community-based municipal telephone survey conducted by New York's Department of Health and Mental Hygiene (NYC DOHMH) in 2009 to estimate the prevalence and distribution of bedbug infestation in New York City. To explore and understand risk factors we used these data to examine demographic and behavioral characteristics, household composition and building and neighborhood environmental characteristics as possible determinants of infestation. This analysis will add to the knowledge of individual, building and neighborhood-level determinants to help generalize these findings and quantify risks. We also examined health and mental health characteristics as possible outcomes of infestation.

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Methods

Data Source

The Community Health Survey (CHS) is an annual representative cross-sectional telephone survey of NYC adults aged 18 and older. This survey is administered by the NYC DOHMH and collects self-reported measures of health, behaviors and demographic characteristics using a neighborhood stratified random sample. Details of the study and sampling scheme are reported elsewhere.[23]

In 2009, the CHS had approximately 125 questions. Responses were collected using a computer assisted telephone interview format. Interviews were conducted in English, Spanish, Russian or Chinese. Group residences, such as college dormitories, and homes of families with both

landlines and cell phones were excluded. Among households agreeing to participate, one adult was selected at random to complete the survey, which took an average of 25 minutes to complete. The response rate was 34% for landline and 50% for cell phone, with a cooperation rate of 88% and 97%, respectively. The survey and method for gathering informed consent was approved by the DOHMH Institutional Review Board. The current analysis was deemed exempt from review by the CUNY Hunter College Institutional Review Board.

Measures

We used CHS responses to generate prevalence estimates, explore predictors of self-reported bedbug infestation, and examine the extent to which bedbug infestation predicted key health outcomes. Bedbug infestation was measured as a dichotomous response to: "During the past 12 months, have you had a problem with bedbugs in your home that required an exterminator?"

Individual predictors of bedbug infestation explored were all self-reported, and included age (grouped 18-24, 25-44, 45-64, 65+ years), sex, race/ethnicity (white, black, Asian, Hispanic; "other" [n=175] was recoded as missing), education (less than high school, high school graduate, some college/technical school, college graduate), household poverty status (<200% of Federal Poverty Level [FPL] vs. >=200% of FPL), partnership status (married/member of unmarried couple vs. divorced/widowed/separated/never married) and country of nativity (U.S. vs. foreign born). For behaviors, we explored number of sex partners (0-1 vs. 2 or more). Environmental predictors included neighborhood poverty levels (high, medium, low – based on

tertiles of percent of residents living with incomes <200% FPL), and number of units in building (1-2 units, 3-9 units, 10-49 units and 50 or more units).

As an exploratory measure, we also examined sugar sweetened beverage consumption (average consumed per day; none, less than one, one or more). In the existing research literature there are indicators that diet, particularly sugar consumption, could plausibly have an effect on bite sensitivity. Sugar may have a complex connection to allergic reaction and inflammatory response, and may affect dermatological presentation.[24-26] Bedbugs also seem to be attracted to carbon dioxide (CO2),[27] which may be higher in the exhaled breath of humans with high sugar consumption.[28] Further, sugar in blood meals have been associated with increased fecundity in a range of insects,[29] and could plausibly increase the severity of infestation and speed of transmission.

In separate analyses, health outcomes and coping mechanisms examined included current depression, first diagnosis of depression in last 12 months, non-specific psychological distress (NSPD), ever diagnosed with diabetes, ever diagnosed with asthma, and asthma-related emergency department visits in the past 12 months, heavy alcohol drinking, binge drinking. NSPD, described by Ridner as having five defining attributions of harmful psychological impairment,[30] as have been was determined by the standardized K6 scale, a standardized six-question short screening for mental health.[31] Diabetes, asthma and depression were determined by dichotomous answers to standardized questions modeled after the Behavioral

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Risk Factor Surveillance System for self-report of diagnosis by a health professional. ("Have you ever been told by a doctor, nurse or other health professional that you had [*condition x*]?"). Heavy alcohol drinking was defined as >2/day for men, >1/day for women, and binge drinking was defined as reporting five or more drinks on at least one occasion in the past 30 days. In models exploring the association between bedbug infestation and select health outcomes, we also examined insurance status (private, Medicare, Medicaid/Family Health Plus, other, uninsured) as a possible confounder of health outcomes through differentiated likelihood of diagnosis.

Data Analysis

Analyses in this study were performed using SAS version 9.2 (SAS Institute, Cary, NC). DOHMH-developed weighting strategies were applied to adjust for sampling methodology, adult telephone usage,[32, 33] and to reflect age, gender and race distributions of neighborhoods (zipcode aggregations designated by the United Hospitalization Fund). To identify factors associated with bedbug infestation, each covariate was analyzed in bivariate logistic regression using a chi-squared test. Those with significant p-values at the 95% confidence level were included in a final multivariable logistic regression model with reported bedbug infestation as the outcome. In order to adjust for household size (significant in unadjusted models) and age of children, we included number of children by age group (<6 years old, 6-12 years old, 13-17 years old), and number of adults aged 18 and older (recoded to 1, 2, and 3 or more) in the adjusted bedbug model, regardless of unadjusted significance.

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To characterize potential health effects from bedbug infestation, we created separate models for each of the health outcomes examined. Base models each had bedbugs as the only predictor. We then examined each covariate with significant association to bedbugs in a bivariate model with the outcome. Where a covariate association was significant, we added this factor to the base model. If the covariate effected a 10% change in the beta coefficient for bedbug infestation, we added the covariate to the final model, to adjust for possible confounding of the relationship between bedbug infestation and the health outcome of interest.

Results

In 2009, 6.7% (95% CI 5.9-7.5) of adults self-reported a bedbug infestation requiring an exterminator in the past year. (Table 1) By borough, Brooklyn had the highest level of infestation (8.9%) and Staten Island the lowest (2.5%). The distribution of bedbug infestations showed an inverse relationship with age of the adult respondent, ranging from 10.5% for those 18-24 years old to 3.5% for those 65+. Hispanic residents had the greatest proportion of reported infestations (10.5%), the proportion among blacks was also elevated compared with whites (7.4%), and white residents had the lowest (3.8%, $p<0.01$). Those with low household poverty status (<= 200% of FPL) had significantly higher reported infestations compared with those with higher income (12.0% vs. 3.6%), and this negative association pattern was consistent with two other measure of socioeconomic status: education (12.4% less than high school through 4.5% for college graduate, $p<0.01$), and neighborhood poverty levels (10.9% for high poverty neighborhoods and 3.2% for low poverty neighborhoods, $p<0.01$).

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Overall, there was a higher burden among respondents with children under 18 years of age, and we observed a positive gradient of association with total number of children (data not shown). When number of children was categorized by age, the gradient was most pronounced among younger ages. (Table 1) Likewise, number of adults in the household showed a positive gradient with infestations. Respondents reporting having no or one sexual partner appeared to have fewer infestations than those having two or more (6.7% versus 10.5%, p=0.01). The differences in infestations among those with any measures of asthma were not significant.

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In the final adjusted model containing factors significant in bivariate analysis, only younger age of respondent (compared to 65+, 18-24 adjusted odds ratio [AOR] 2.0; 25-44 AOR 1.8), household poverty status below 200% of FPL compared to higher income (AOR 2.7), three or more adults compared with one (AOR 1.6), and highest tertile of neighborhood poverty compared with lowest tertile (AOR 1.9) were significant positive predictors of bedbug infestation. (Table 2) Education was excluded from consideration for the final model with bedbugs as the outcome, as any association between education and infestations disappeared when adjusted for poverty status. Living in a 1-2 units in building compared with 50 units or more was protective (AOR 0.4), compared to living in a building with 50 or more units. Associations of bedbug infestations with race and numbers of children in all age groups were no longer significant in the adjusted model.

The exploratory variable, sugar-sweetened beverages was significantly associated with bedbug infestation in both unadjusted and adjusted models (less than one beverage per day, AOR 1.8, 95% CI 1.2-2.6; and one or more per day, AOR 2.0, 95% CI 1.4-3.0 compared to none). Adding the consumption of sugar-sweetened beverages to the adjusted model, improved the model fit and attenuated the association between age and bedbug infestation (data not shown).

Prevalence of select coping mechanisms, health and mental health outcomes were as follows: current depression, 13.1% (95% CI 12.1-14.1), first diagnosis of depression in last 12 months, 3.9% (95% CI 3.4-4.5), NSPD 5.0% (95% CI 4.4-5.7), heavy alcohol drinking 4.8% (95% CI 4.1-5.5), binge drinking 15.0% (95% CI 13.8-16.2), ever diagnosed with asthma 11.3% (95% CI 10.3-12.3), episode of asthma in the past 12 months 4.1% (95% CI 3.4-4.6), and asthma-related emergency department visits in the past 12 months, 2.0% (95% CI 1.6-2.3), and diabetes (ever) 9.2% (95% CI 8.5-10.0). Only NSPD and diagnosed depression had significant associations with bedbugs in unadjusted models. Neither of these associations was significant in the final adjusted models. (Table 3) Asthma as an outcome did not appear to be associated with bedbug infestation (OR 0.9, 95% CI 0.6-1.5), nor did emergency visit for asthma in the past 12 months (OR 1.5, 95% CI, 0.6-4.3), although only 33 households with bedbug infestations reported an emergency visit for asthma.

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Discussion

This analysis is one of the first population-based studies to estimate the prevalence of reported bedbug infestation and associated predictors in an urban setting. Overall, we estimated that nearly one in fifteen NYC households (6.7%) reported a bedbug infestation in the past year in 2009, with significant differentiation across the City's boroughs. In the adjusted model, the only demographic factor associated with infestation was age. At the household level, factors associated with infestation included household poverty and number of adults, echoing literature on risks of other insect infestations.[6] Significant building- and neighborhood-level factors included neighborhood poverty and number of units in the building. These findings may be useful for guiding prevention and infestation control measures, as well as estimating the impact of various transmission mechanisms. By comparing these patterns to other kinds of insect infestations, we may also better understand the dynamics and possible consequences of a changing entomological landscape.

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The exact role of these identified individual, household and environmental factors in bedbug transmission are unknown; some possibilities are discussed below based on the two most likely means of bedbug transmission proposed in previous research: hitchhiking and apartment-to-apartment travel.[11] At the individual respondent level, age may be a marker for social behaviors that increase bedbug hitchhiking, such as more frequent and wider socialization, different use of transportation (public vs. private, bus vs. train, taxi vs. car), libraries, schools or other public spaces, more frequent exchange or collection of used furniture or clothing, more frequent local or international travel, more crowded apartments, or other cohort specific

behaviors that change the risk profile. We should note, however, that associations with individual characteristics may also reflect dynamics of an increased propensity to report infestations, rather than actual infestations themselves. For example, younger age groups could exhibit greater media susceptibility and as a consequence interpret any insect infestation as a bedbug infestation, they could have higher skin sensitivity and be more likely to perceive true infestation, or have a perception of stigma different from older age groups and be more likely to acknowledge infestation.

Our finding that more adults in the household increases infestation risk may be reflecting a greater aggregate social exposure and subsequent higher risk of introduction through hitchhiking. Because we have no way of assessing ages of other adults outside of respondents, we did not examine the impact of number of adults stratified by age group in the same way as we did for children. Having more adults may, in fact, be a sign of a greater mix of ages of adults in the household. As infestation risk may be the aggregate risk of household members, having a greater likelihood for higher risk (possibly younger) individuals may increase the risk across multi-adult households. In spite of the higher prevalence of infestation among households with more younger children, in the fully-adjusted model, we did not see that number of children in the household was associated with infestation. Household poverty could also increase the odds for hitchhiking, through similar acquisition of used clothing or property, or frequenting public services. The higher risk associated with neighborhood poverty may be reflecting hitchhiking transmission through a higher level of contact from high density housing and crowded

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apartments, or through the same (or higher) contact with a population at higher risk through individual poverty levels.

These findings can also be interpreted to support the possibility of apartment-to-apartment transmission. The greater likelihood of infestation among higher poverty households may reflect the resources, recourse and self-efficacy of tenants to ensure effective building management.[34] Building size is also positively correlated with infestation risk, with lower levels of infestation in 1-2 unit buildings. If points of egress (pipes or conduit) between apartments above, below or adjacent have not been appropriately sealed, bedbugs may be encouraged to travel within the building and between apartments; in these smaller buildings, introduction must come from outside or from only one adjacent apartment, which in turn would have introduction only from the outside. Apartments in larger, and, particularly, poorly managed buildings may also be more often subject to transfer from common areas, such as lobbies or laundry rooms, or from other building features that depend on unit count. These entry points may also increase transmission risks building wide through apartment-to-apartment transmission in buildings with higher levels of infested apartments. Although unit count may be confounded by a number of other risk factors such as income, household size and neighborhood, further examination of bedbug infestation by building type may identify building-level risks and offer guidance for methods of pest control.

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Bedbug infestation was not statistically significantly associated with any health and mental health outcomes examined. It is of particular interest that, unlike cockroaches,[35] bedbugs showed no association with the asthma or asthma-related emergency department visits outcome. This may be due to limited study power to detect a small effect, more prompt and extreme extermination efforts from a higher perceived nuisance factor, a number of pest control practice differences for bedbugs compared with other household pests, or fewer or different allergens for bedbugs, but there is little evidence to support the likelihood of an association being masked by confounding. In short, our findings do not support the prior suggestion of a possible association of bedbug infestation with asthma found in a study using a sample of 11 bedbug-infested households.[13]

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Findings seen here do, however, highlight the possibility of other potential health issues that may result from this distribution of infestation. Low-income tenants especially may lack control over extermination options, and may not have access to best management practices such as low-toxicity bedbug extermination. In low-income housing where higher risk of other types of infestation already exist, the increased risk for bedbugs may augment the current disproportionate total burden of pesticide exposure for low-income populations. Families with children under six, while not at special risk for bedbug infestation according to our data, did report a high prevalence of infestation, and young children are vulnerable to substantially greater health risks from pesticide use.[36, 37] This group should come under special consideration as education and pest control resources are allocated.

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Our exploration of sugar-sweetened beverages deserves mentioning. The impact of sugar-sweetened beverage consumption may be indirectly measuring other social and behavioral differences; for instance, susceptibility to soda marketing may correlate with susceptibility to influence of media in the reporting of bedbugs as an epidemic, which could lead to greater reporting. The observed association may also be due to residual confounding by income or other factors. Likewise, results could reflect residual confounding. Nevertheless, biological plausibility for potential links of sugar consumption to higher reporting or higher infestation levels warrant further study of this phenomenon.

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This study was cross-sectional, which limits conclusions about temporal order. The primary outcome variable was reported infestations *in the past year*, however, and many covariates, such as education, poverty and children ages 13-17, likely predate infestation. Especially important for health and mental health as outcomes, infestations "in the past year" may represent ongoing infestations, and responses to the question of infestation may have missed those infestations that predate or were coincidental with health and mental health outcomes modeled here. Hence, the effect of these earlier or persistent bedbug infestations may be underestimated for mental health outcomes. Links to some health consequences may require more time than is covered in this analysis: mental health outcomes may be latent for a period after first experiencing an infestation, and increased risk for any disease associated with pesticide use may depend both on cumulative exposure and time. It is unlikely that these kinds

of delayed associations could be measured against such a recent measure of infestations or exterminations. Other events, such as neighborhood media coverage of bedbug epidemics, may temporarily influence bedbug identification.[3]

Other factors may obscure true infestation prevalence, with potential negative reporting in subgroups due to stigma or increased or decreased reporting from pressing health concerns. For instance, parents may be more attuned to possible infestations than adults without children. Bite sensitivity may also influence bedbug reporting, and population sensitivity prevalence is largely unknown.[38] Sensitivity may increase with exposure, and, as a consequence, may change reporting, and prevalence estimates, going forward. Also, bedbugs are small, hide during the day and have different appearance at different life stages, which may lead to resident misidentification, as is anecdotally reported by exterminators, and misidentification may be differential within a given population.[39] This survey asked about bedbug infestations which required an exterminator, and caution should be used in interpreting this prevalence as the level of infestation – factors such as cost, experience, and cultural norms and overall health may have an impact on the pest control services used.

In spite of the issues surrounding the uniformity and accuracy of infestation, self-report may still be the best measure of the impact of the bedbug resurgence. Because of differences in bite sensitivity and in perception of threat, the psychological impact of the rise in bedbug infestations may be distinct from the experience of actual bedbug infestations; some

Commented [LET20]: This paragraph is good, but it could use some tighter synthesis to get points across more succintly.

individuals experiencing true infestations may have less awareness or experience less anxiety or stress from bedbugs than others who are not infested, but who are fearful of infestation. It is also possible that self-report will, as more information becomes available, prove to be an accurate marker of infestation levels. Even considering possible reporting biases in this study, our findings on prevalence across demographic factors may help evaluate and interpret measures of infestations from other data sources, such NYC levels of complaints and building violations, as a preliminary step in establishing proxies for infestation.

Lastly, NYC's population and housing stock is unique, diverse, and subject to local environmental characteristics and municipal policies that may have an impact on bedbug transmission and limit generalizability.

Commented [LET21]: Might be more effective to avoid using "unique" and try and pinpoint what specific characteristics are unique and relevant to this research question.

Conclusions

Individual and environmental poverty-related factors seem to drive much of the differentiated prevalence in this sample and cost of extermination may be a barrier to effective pest control in this population. If not addressed thoroughly and systematically, those living in disadvantaged neighborhoods could be exposed to a greater reservoir of bedbugs, possibly furthering the high risk in an already-burdened population and making neighborhood control more difficult. Multiple transmission mechanics may be at work. Environmental risk factors suggest that building-level issues can be investigated for interventions, and risk for younger ages and household size suggest community interventions as well as public education models. Determining differentials of reporting in future research may help rule out bite sensitivity as a

Commented [LET22]: Rethink this sentence – Did you actually show that these risk factors explained much of the variance? How do you know cost might be a barrier? By putting it in this particular sentence, it implies your findings show this. If sop, explain how.

Rest of paragraph is excellent!

confounder of infestation distribution and open the door to use of instrumental variables to measure bedbug prevalence. The association of bedbugs with consumption of sugar-sweetened beverages may be due to residual confounding by income or other factors, but the strength and robustness of the association and the biological plausibility of influence of dermatological presentation, bedbug attraction or bedbug fertility after feeding may warrant further investigation.

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Table 1 - Bedbug Prevalence by Socio-Demographics, Health

	Total N (not wtd)	Total %	95% CI
Total Reported Bedbug Infestation	**558**	**6.7**	**5.9-7.5**
Demographics of Respondent			
Age			
18-24	42	10.5	6.8-14.3
25-44	202	7.7	6.3-9.1
45-64	210	5.3	4.2-6.4
65+	101	3.5	2.7-4.4
Sex			
Males	211	6.6	5.3-7.9
Females	347	6.7	5.7-7.8
Race			
White, Non-Hispanic	144	3.8	2.9-4.7
Black, Non-Hispanic	146	7.4	5.5-9.3
Hispanic	221	10.9	8.8-12.9
Asian	39	6.2	3.5-8.9
Poverty Levels			
<=200% Federal Poverty Level	323	12.0	10.1-13.9
> 200% Federal Poverty Level	157	3.6	2.8-4.5
Education (highest grade)			
Less than HS	143	12.4	9.4-15.3
Grade 12/GED	145	7.5	5.6-9.3
Some College	121	6.7	4.9-8.4
College Graduate	145	4.5	3.4-5.6
US Born (yes)	266	5.3	4.3-6.4
No	285	8.5	7.1-9.9

Continued

Table 1 - Bedbug Prevalence by Socio-Demographics, Health, Continued

	Total (not wtd)	Total %	95% CI
Household Makeup			
Partnership Status			
Married/Member of Unmarried Couple	216	6.5	5.4-7.7
Divorced/Separated/Widowed/Never Marrried	336	6.9	5.7-8.1
Children <6yrs			
None	442	5.7	4.9-6.6
One	74	8.8	6.0-11.7
Two or More	40	13.1	8.4-17.8
Children 6-12 years			
None	436	6.0	5.2-6.9
One	79	8.6	5.7-11.4
Two or More	41	12.0	7.3-16.7
Children 13-17 years			
None	453	6.3	5.4-7.1
One	85	10.0	6.7-13.3
Two or More	18	5.4	2.4-8.5
Number of Adults			
One	241	5.2	4.1-6.3
Two	186	6.1	4.9-7.3
Three or More	131	9.0	7.0-11.0
Environmental			
Units in Building			
1-2	86	3.4	2.4-4.5
3-9	118	9.8	7.3-12.2
10-49	151	8.8	6.7-11.0
50 or More	163	6.3	4.8-7.8
Neighborhood Poverty Status			
High Poverty	272	10.9	8.9-12.9
Med Poverty	186	5.8	4.6-7.0
Low Poverty	95	3.2	2.2-4.2

Continued

Table 1 - Bedbug Prevalence by Socio-Demographics, Health, Continued

	Total (not wtd)	Total %	95% CI
Environmental, cont.			
Borough			
Bronx	106	8.1	5.8-10.3
Brooklyn	186	8.9	7.1-10.8
Manhattan	129	5.8	4.0-7.6
Queens	113	5.0	3.8-6.3
SI	24	2.5	1.3-3.7
Behaviors			
Heavy Alcohol Drinker (yes)	22	6.2	2.3-10.2
no	523	6.6	5.8-7.4
Binge Alcohol Drinker (yes)	74	7.3	5.0-9.6
no	479	6.6	5.7-7.5
Sugar-sweetened Beverage Consumption			
None	200	4.0	3.2-4.9
Less than One	148	6.9	5.3-8.5
One or More	201	9.7	7.8-11.5
Number of Sexual Partner			
None or One	441	6.7	5.7-7.6
Two or more	64	10.5	7.1-13.9

Table 2 - Modeling Bedbugs with Demographic, Neighborhood and Behavioral Characteristics

Using weights, and adjusting for stratified sample. Significant associations bold and italic.

	Unadjusted		Adjusted Model	
	OR	**95% CI**	**OR**	**95% CI**
Age				
18-24	***3.2***	***2.0-5.2***	***2.0***	***1.1-3.6***
25-44	***2.3***	***1.7-3.1***	***1.8***	***1.1-2.9***
45-64	***1.5***	***1.1-2.1***	1.3	0.8-2.0
65+	*1.0*		*1.0*	
Race				
White, non-Hispanic	*1.0*		*1.0*	
Black, Non-Hispanic	***2.0***	***1.4-2.9***	1.3	0.8-2.0
Hispanic	***3.1***	***2.2-4.3***	1.2	0.7-2.0
Asian	1.7	0.99-2.8	1.5	0.8-2.7
Nativity				
US Born	*1.0*		*1.0*	
Foreign Born	***1.6***	***1.3-2.2***	0.91	0.6-1.3
Poverty Status				
>=200% Federal Poverty Level (FPL)	*1.0*		*1.0*	
<200% FPL	***3.6***	***2.7-4.9***	***2.7***	***1.9-4.0***
Neighborhood Poverty Status				
Low Poverty	*1.0*		*1.0*	
Med Poverty	***1.9***	***1.3-2.8***	1.2	0.7-1.5
High Poverty	***3.7***	***2.5-5.5***	***1.9***	***1.1-3.1***
Units in Building				
1-2	***0.5***	***0.4-0.8***	***0.4***	***0.3-0.7***
3-9	***1.6***	***1.1-2.4***	1.1	0.7-1.6
10-49	***1.4***	***1.0-2.1***	1.0	0.7-1.5
50+ units	*1.0*		*1.0*	

Continued

Table 2 - Modeling Bedbugs with Demographic, Neighborhood and Behavioral Characteristics, Continued
Using weights, and adjusting for stratified sample. Significant associations bold and italic.

	Unadjusted		Adjusted Model	
	OR	**95% CI**	**OR**	**95% CI**
Children <6 years				
None	*1.0*		1.0	
One	***1.6***	***1.1-2.3***	1.0	0.6-1.6
Two or More	***2.5***	***1.6-3.8***	1.7	0.9-3.0
Children 6-12 years				
None	1.0		1.0	
One	1.5	0.98-2.2	1.0	0.6-1.6
Two or More	***2.1***	***1.3-3.4***	1.1	0.6-2.0
Children 13-17 years				
None	1.0		1.0	
One	***1.7***	***1.1-2.5***	1.5	0.96-2.4
Two or More	0.9	0.5-1.6	0.7	0.3-1.4
Number of Adults				
One	1.0		1.0	
Two	1.2	0.8-1.6	1.1	0.7-1.5
Three or More	***1.8***	***1.3-2.5***	***1.6***	***1.1-2.4***
Number of Sexual Partners				
None or One	*1.0*		*1.0*	
Two or more	***1.7***	***1.1-2.4***	1.6	0.998-2.6

Table 3 - Non-specific Psychological Distress and Depression by Bedbug Infestation, Unadjusted, and Adjusted for Potential Confounders

	NSPD				Depression Ever			
	N	% Prevalence	95% CI		N	% Prevalence	95% CI	
Total Distribution in population	**1571**	**13.1**	**12.1-14.1**		**539**	**5.0**	**4.4-5.7**	
	Unadjusted		Model 1		Unadjusted		Model 1	
	OR	95% CI	AOR	95% CI	OR	95% CI	AOR	95% CI
Bedbugs (yes vs. no)	**2.2**	**1.5-3.4**	**1.5**	**0.94-2.4**	**1.6**	**1.1-2.1**	**1.4**	**0.96-2.0**
Age								
18-24	0.8	0.4-1.6			0.5	0.3-0.8	1.1	0.6-2.0
25-44	1.1	0.8-1.5			0.9	0.7-1.1	2.0	1.4-2.9
45-64	1.3	1.0-1.8			1.4	1.1-1.7	2.9	2.1-3.9
65+	1.0				1.0		1.0	
Race								
White, Non-Hispanic	1.0				1.0		1.0	
Black, Non-Hispanic	1.1	0.7-1.6			0.5	0.4-0.6	0.4	0.3-0.5
Hispanic	1.7	1.2-2.3			0.8	0.7-1.0	0.7	0.5-0.9
Asian	1.3	0.8-2.3			0.4	0.3-0.6	0.5	0.3-0.8
US Born								
Yes	1.0				1.0		1.0	
No	1.2	0.9-1.6			0.6	0.5-0.8	0.6	0.5-0.8
Poverty Status								
200% or more	1.0				1.0		1.0	
<200% FPL	3.1	2.2-4.3	2.2	1.4-3.4	1.3	1.1-1.6	1.6	1.2-2.1
Education (highest grade)								
College graduate	1.0				1.0			
Less than High School	2.9	2.0-4.2	1.6	0.9-2.5	1.2	0.98-1.6	0.6	0.4-0.8
Grade 12/GED	1.5	1.0-2.2	0.9	0.7-1.8	0.7	0.6-0.9	0.9	0.7-1.3
Some College	1.7	1.1-2.6	1.1	0.7-1.8	0.8	0.7-1.04	0.8	0.6-1.03
Neighborhood Poverty Status								
Low Poverty	1.0				1.0			
High Poverty	1.4	1.0-2.0			1.1	0.9-1.3		
Med Poverty	1.2	0.9-1.8			0.9	0.7-1.1		
Units in Building								
1-2	0.6	0.4-0.8	0.6	0.4-0.96	0.5	0.4-0.7	0.7	0.5-0.9
3-9	1.1	0.8-1.7	1.0	0.6-1.6	0.8	0.6-1.0	0.9	0.7-1.2
10-49	0.9	0.6-1.4	0.8	0.5-1.2	0.9	0.7-1.1	0.9	0.6-1.2
50 or More	1.0		1.0		1.0			

Continued

Table 3 - Non-specific Psychological Distress and Depression by Bedbug Infestation, Unadjusted, and Adjusted for Potential Confounders, continued

	NSPD				Depression Ever			
	Unadjusted		Model 1		Unadjusted		Model 1	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Children <6yrs								
None	1.0		1.0		1.0		1.0	
One	0.9	0.6-1.4	0.8	0.5-1.3	0.8	0.6-1.1	0.9	0.7-1.4
Two or More	0.4	0.2-0.8	0.4	0.2-0.8	0.5	0.3-0.8	0.5	0.3-0.9
Children 6-12 years								
None	1.0				1.0			
One	1.1	0.7-1.8			0.8	0.6-1.1		
Two or More	1.0	0.5-2.0			0.5	0.3-0.8		
Children 13-17 years								
None	1.0				1.0			
One	0.9	0.6-1.4			0.9	0.7-1.2		
Two or More	1.0	0.6-1.9			0.6	0.4-.97		
Number of Adults								
One	1.0				1.0		1.0	
Two	0.8	0.6-1.1			0.7	0.6-0.8	0.7	0.6-0.9
Three or more	1.0	0.7-1.4			0.6	0.4-0.7	0.7	0.5-0.9
Number of Sexual Partners								
None or One	1.0				1.0			
Two or more	1.5	0.9-2.3			1.3	1.0-1.7		
Insurance type								
Medicaid/Family Health Plus	1.0				1.0			
Private	0.3	0.2-0.4	0.6	0.3-0.9	0.5	0.4-0.6	1.2	0.8-1.8
Medicare	0.8	0.5-1.1	0.9	0.6-1.4	1.0	0.8-1.3	0.5	0.3-0.9
Others	0.6	0.3-1.4	0.9	0.4-2.2	0.6	0.4-0.9	0.5	0.4-0.7
Uninsured	0.6	0.4-1.0	0.7	0.4-1.2	0.4	0.3-0.6	0.4	0.3-0.6

Self-Reported Bed Bug Infestation Among New York City Residents: Prevalence and Risk Factors

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Abstract Bed bug infestations have risen precipitously in urban areas. Little is known about risk factors for infestations or health outcomes resulting from these infestations. In the 2009 Community Health Survey, which is a representative population-based survey, 9,934 noninstitutionalized adults in New York City reported on bed bug infestations requiring an exterminator in the past year. The authors estimated infestation prevalence and explored predictors of infestation and associations between infestations and health outcomes using logistic regression. Seven percent of adults in New York City reported bed bug infestations. Significant individual and household risk factors were younger age, increased household poverty, and having three or more adults in the household. Environmental risk factors included living in high poverty neighborhoods and in buildings with more housing units, suggesting apartment-to-apartment transmission. Bed bug infestations were not associated with stress-related outcomes of alcohol consumption or recent depression, and, unlike cockroach infestation, were not associated with recent asthma episodes caused by allergens or contaminants.

Introduction

Bed bug infestations virtually disappeared in industrialized countries after World War II. In the past decade, however, urban centers around the world have seen double-digit increases in reported infestations (Boase, 2008; Doggett & Russell, 2008). In the U.S., measurement of infestation across geographic areas has not been systematic; estimates are frequently generated from housing complaints and municipal control efforts. To date, New York City has reported higher infestation levels, with data from the city's telephone complaint line indicating a sharp increase in the past decade, from 537 in 2003 to 1,839 in 2004 to 10,985 in 2009 (Centers for Disease Control and Prevention [CDC], 2011). These reports are unverified and interpretation of estimates remains challenging.

Little is known about risk factors for bed bug infestation. Bed bug transmission has largely been assumed to happen via "hitchhiking"—when bed bugs separate themselves on clothing or personal items and travel with new hosts who have visited infested places or acquire infested furniture, clothing, or toys (Wang, Saltzmann, Chin, Bennett, & Gibb, 2010). Historically, research has suggested that building characteristics may present higher risk for other infestations; for example, low-income households are at greater risk for mice or cockroach infestations, possibly due to overcrowding and poor housing stock, with implied inferior building management (Rauh, Chew, & Garfinkel, 2002). More recently, field reports from one study proposed apartment-to-apartment bed bug travel via structural egress points such as hallways or electrical conduit (Wang et al., 2010).

The physical health impact of the apparent rise in infestations has yet to be determined. Known health effects of bed bugs are primarily limited to rare cases of anaphylactic shock (Goddard & deShazo, 2009; Parsons, 1955) and more common dermatological bite reactions of blisters and rashes (Mazzotti et al., 2003; Sansporgna et al., 2004). Bites can itch, which may lead to secondary infection from scratching (Delaunay et al., 2011). Unlike cockroach allergens (Wang, Abou El-Nour, & Bennett, 2008), the limited studies examining possible association between bed bug infestation and asthma onset or exacerbations are inconclusive (Abou Gamra, el Shayeb, Morsy, Hussein, & Shehata, 1991). Bed bugs are unlikely to transmit infectious diseases (Jupp, Purcell, Phillips, Shapiro, & Gerin, 1991; Vaughan & Azad, 1993; Webb et al., 1989). Hepatitis B is a possible exception (Delaunay et al., 2011) with a second recent hypothesis that bed bugs could serve as a reservoir for methicillin-resistant *Staphylococcus aureus* (Lowe & Romney, 2011). Since the bed bug resurgence, studies on prevalence of dermatological presentations and vector competency for transmitting infectious diseases have dominated research on health outcomes.

Bed bug infestations probably cause mental stress, with largely unknown consequences. One study found that among 474 households with confirmed cases of bed bugs, some resi-

dents reported mental health symptoms in relation to infestations, including sleeplessness (29%), anxiety (20%), emotional distress (22%), and stress (14%) (Pottier et al., 2010). Recent research findings interpreted Internet blog-reported consequences of bed bug infestation such as sleeplessness, hypervigilance, and nightmares as possible cases of posttraumatic stress disorder (Goddard & de Shazo, 2012). Cases of delusional parasitosis have been reported both as a purely psychosocial phenomenon and as an immediate aftershock of cleared infestation (Freeman, de Jong, & Albrecht, 2008). Bed bug–related skin conditions may add to mental stress (Mazzotti et al., 2003; Sampogna et al., 2004). Anecdotes of social ostracism—from job loss to dating barriers—have been noted in social networking outlets and other media (Feldman, 2011; Fiegre, 2010; United Press International, 2010).

In our study, we used self-reported data from a community-based municipal survey conducted by New York City's Department of Health and Mental Hygiene (DOHMH) in 2009 to estimate the prevalence and distribution of bed bug infestation in New York City. We used these data to explore possible determinants of infestation, including demographic and behavioral characteristics, household composition, and environmental characteristics. We also examined health and mental health characteristics as possible outcomes of infestation.

Methods

Data Source

The Community Health Survey is an annual representative cross-sectional telephone survey of New York City adults aged 18 and older. This survey is administered by DOHMH and collects self-reported measures of health, behaviors, and demographic characteristics using a neighborhood-stratified random sample. Details of the study and sampling scheme are reported elsewhere (Mostashari, Kerker, Hajat, Miller, & Frieden, 2005). Briefly, in 2009, responses to 125 questions were collected using a computer-assisted telephone interview format available in English, Spanish, Russian, or Chinese. Group residences, such as college dormitories, were excluded. Among households agreeing to participate, one adult was selected at random to complete the survey. The response rate was 34% for landline phones with a cooperation rate of 88%, and 50% for cell phones with a cooperation rate of 97%. This study was approved by the DOHMH institutional review board; the current analysis was considered exempt by the Hunter institutional review board.

Measures

We estimated prevalence, explored predictors of self-reported bed bug infestation, and examined whether bed bug infestation predicts key health outcomes. Bed bug infestation was measured as a dichotomous response to the question, "During the past 12 months, have you had a problem with bed bugs in your home that required an extermination?"

Individual predictors of bed bug infestation included age (grouped as 18–24, 25–44, 45–64, or 65+ years), sex, race/ethnicity (Caucasian, African-American, Asian, or Hispanic; "other" [$n = 175$] was recoded as missing), education (less than high school, high school graduate, some college/technical school, or college graduate), household poverty status (<200% of federal poverty level [FPL] vs. ≥200% of FPL), partnership status (married/member of unmarried couple vs. divorced/widowed/separated/never married), and country of nativity (U.S. vs. foreign born). For behaviors, we explored number of sex partners in the past year (0–1 vs. 2 or more); as more sex partners could hypothetically be associated with greater exposure to bed bugs. Environmental predictors include neighborhood poverty levels (high, medium, low—based on tertiles of percentage of residents living with incomes <200% FPL), and number of units in building (1–2 units, 3–9 units, 10–49 units, and 50 or more units, by self-report).

In separate analyses, we examined the following health outcomes and coping mechanisms: first diagnosis of depression in last 12 months or nonspecific psychological distress (NSPD) to examine stress-related mental health issues; asthma episode in past 12 months or asthma-related emergency department visits in the past 12 months to explore possible effects of allergens or contaminants; and heavy alcohol drinking and binge drinking to investigate stress-related health impact. NSPD, described by Ridner as having five defining attributions of harmful psychological impairment (Ridner, 2004) was determined by the Kessler-6 scale, a standardized six-question short screening for mental health (Kessler et al., 2002). Heavy alcohol drinking was defined as >2/day for men and >1/day for women on days where the respondent drank, and binge drinking was defined as reporting five or more drinks on at least one occasion in the past 30 days (CDC, 2009). In models for select health outcomes, we included insurance status as a possible confounder due to the potential influence of differential likelihoods of diagnosis.

Data Analysis

We used SAS v. 9.2 for analysis. DOHMH-developed weights were applied to adjust for sampling methodology, adult telephone usage (Jacobs et al., 2010; New York City Department of Health and Mental Hygiene, 2010) and to reflect age, gender, and race distributions of neighborhoods. To identify factors associated with bed bug infestation, each covariate was analyzed in bivariate logistic regression using a Chi squared test; those with significant p-values of .05 or less were included in a final multivariable model. We quantified number of children by age group (<6 years old, 6–12 years old, or 13–17 years old), and number of adults aged 18 and older (recoded to 1, 2, and 3 or more) and included these measures in the adjusted bed bug model, regardless of bivariate significance, to examine infestation distribution by age.

To measure potential health effects of bed bug infestation, we created separate models for each health outcome. We selected potential confounders from significant variables in bivariate models with bed bugs as the outcome and, in a base model with bed bugs as the only predictor, we added each factor to the base model. If the covariate effected a 10% change in the beta coefficient for bed bug infestation, we added the covariate to the final adjusted model.

Results

In 2009, 6.7% of adults self-reported a bed bug infestation requiring an extermination in the past year, with prevalence varying by borough (Table 1). Overall, the distribution showed a clearly graded, inverse relationship with age, ranging from 10.5% for those 18–24 years old to 3.5% for those 65+. Hispanic residents had the greatest prevalence (10.5%) followed by African-Americans (7.4%) ($p < .01$) compared to Caucasians (3.8%). Those

with low household income (≤200% of FPL) had significantly higher reported infestations compared with those with higher income (12.0% vs. 3.6%). This pattern was consistent with two other measures of socioeconomic status: education (12.4% for less than high school through 4.5% for college graduate, $p < .01$) and neighborhood poverty levels (10.9% for high poverty neighborhoods and 3.2% for low poverty neighborhoods, $p < .01$).

A higher burden occurred among respondents with any children under 18 years of age, and we observed a positive gradient of association with total number of children (data not shown). When number of children was categorized by age, the gradient by number of children for infestation was most pronounced for households with children of younger ages (Table 1). Likewise, number of adults in the household showed a positive gradient with infestations. Respondents reporting having no or one sexual partner in the past year reported fewer infestations than those having two or more (6.2% vs. 10.5%, $p = .01$).

In the adjusted model, only younger age of the respondent (18–24 compared to 65+, adjusted odds ratio [aOR] = 2.0; and 25–44, aOR = 1.8), household poverty status below 200% of FPL compared to higher income (aOR = 2.7), three or more adults in the household compared with one (aOR = 1.6), and highest tertile of neighborhood poverty compared with lowest tertile (aOR = 1.9) were significant positive predictors of bed bug infestation (Table 2). Living in a 1–2 unit building was protective compared to living in a building with 50 or more units (aOR = 0.4). Associations of bed bug infestations with race and with number of children were not significant in the adjusted model.

Prevalence of health outcomes and coping mechanisms were: first diagnosis of depression in last 12 months, 3.9% (95% confidence interval [CI] = 3.4–4.5); NSPD, 5% (95% *CI* = 4.4–5.7); heavy alcohol drinking, 4.8% (95% *CI* = 4.1–5.5); binge drinking, 15% (95% *CI* = 13.8–16.2); episode of asthma in the past 12 months, 4.1% (95% *CI* = 3.4–4.6); and asthma-related emergency department visits in the past 12 months, 2.0% (95% *CI* = 1.6–2.3). Only NSPD was significantly associated with self-reported bed bug infestations in unadjusted models. This association was not significant, however, in adjusted models (Table 3). Emergency visit for asthma in the

TABLE **1**

Self-Reported Bed Bug Infestation Requiring Exterminator in Past 12 Months by Sociodemographic Characteristics and Health Indicators, 2009

	Total #[a]	Total %	95% CI[a]
Total Reported Bed Bug Infestation	558	6.7	5.9, 7.5
Demographics of respondents			
Age			
18–24	42	10.5	6.8, 14.3
25–44	202	7.7	6.3, 9.1
45–64	210	5.3	4.2, 6.4
65+	101	3.5	2.7, 4.4
Sex			
Males	211	6.6	5.3, 7.9
Females	347	6.7	5.7, 7.8
Race/ethnicity			
Caucasian, non-Hispanic	144	3.8	2.9, 4.7
African-American, non-Hispanic	146	7.4	5.5, 9.3
Hispanic	221	10.9	8.8, 12.9
Asian	39	6.2	3.5, 8.9
Poverty levels			
≤200% federal poverty level	323	12.0	10.1, 13.9
>200% federal poverty level	157	3.6	2.8, 4.5
Education (highest grade)			
Less than high school	143	12.4	9.4, 15.3
Grade 12/GED	145	7.5	5.6, 9.3
Some college	121	6.7	4.9, 8.4
College graduate	145	4.5	3.4, 5.6
U.S. born (yes)	356	5.3	4.3, 6.4
No	200	8.5	7.1, 9.9
Household makeup			
Partnership status			
Married/member of unmarried couple	216	6.5	5.4, 7.7
Divorced/separated/widowed/never married	336	6.9	5.7, 8.1
Children <6 yrs.			
None	442	5.7	4.9, 6.6
One	74	8.8	6.0, 11.7
Two or more	40	13.1	8.8, 17.8
Children 6–12 yrs.			
None	436	6.0	5.2, 6.9
One	79	8.6	5.7, 11.4
Two or more	41	12.0	7.3, 16.7
Children 13–17 yrs.			
None	453	6.3	5.4, 7.1
One	85	10.0	6.7, 13.3
Two or more	18	5.4	2.4, 8.5
Number of adults			
One	241	5.2	4.1, 6.3
Two	186	6.1	4.9, 7.3
Three or more	131	9.0	7.0, 11.0

continued ▸

TABLE 1 *continued*

Self-Reported Bed Bug Infestation Requiring Exterminator in Past 12 Months by Sociodemographic Characteristics and Health Indicators, 2009

	Total #[a]	Total %	95% CI[b]
Environmental			
Units in building			
1–2	88	3.4	2.4, 4.5
3–9	318	9.8	7.3, 12.2
10–49	151	8.8	6.7, 11.0
50 or more	163	6.3	4.8, 7.8
Neighborhood poverty status			
High poverty	272	10.9	8.9, 12.9
Medium poverty	186	5.8	4.6, 7.0
Low poverty	95	3.2	2.2, 4.2
Borough			
Bronx	136	8.1	5.8, 10.3
Brooklyn	186	8.9	7.1, 10.8
Manhattan	129	5.8	4.0, 7.6
Queens	113	5.0	3.8, 6.3
Staten Island	24	2.5	1.3, 3.7
Behaviors			
Heavy alcohol drinker (yes)	22	6.2	2.3, 10.2
No	523	6.6	5.8, 7.4
Binge alcohol drinker (yes)	74	7.3	5.0, 9.6
No	479	6.6	5.7, 7.5
Number of sexual partners			
None or one	461	6.7	5.7, 7.6
Two or more	64	10.5	7.1, 13.9

[a]Not weighted.
[b]CI = confidence interval.

past 12 months was not associated with bed bug infestation (OR = 1.5, 95% CI = 0.6–4.3), although only 33 households with bed bug infestations reported a recent emergency visit for asthma.

Discussion

This analysis is one of the first population-based studies to estimate the prevalence and associated predictors of reported bed bug infestation in an urban setting. In 2009, nearly one in 15 New York City households (6.7%) reported a bed bug infestation in the past year, with significant differences across the city's boroughs. In the adjusted model, the only individual-level factor associated with infestation was younger age, and at the household level, the only factors associated with infestation were household poverty and number of adult residents, echoing literature on other insect infestations (Rauh et al., 2002). Significant environmental factors included neighborhood poverty and number of units in the building.

The exact role of these factors in bed bug transmission is unknown. Possibilities proposed in previous literature are bed bug hitchhiking and apartment-to-apartment travel (Delaunay et al., 2011). Of these, hitchhiking is relevant to the broadest spectrum of the population. Age may be a marker for social behaviors that increase bed bug hitchhiking, such as differences in frequency and breadth of socialization; different use of transportation; different use of libraries, schools, or other public spaces; frequency of obtaining used furniture or clothing; and local or international travel.

Our finding that more adults in the household increase infestation risk may reflect a greater aggregate exposure or a greater likelihood of younger adults, with higher risk of introduction through hitchhiking. Because we do not know ages of other adults in the household we were unable to examine the impact of number of adults by age group. In spite of differential infestation prevalence by number of younger children, this was not associated with infestation in the fully adjusted model.

Household poverty could increase the risk of hitchhiking through acquisition of used clothing or property or frequenting public services. Neighborhood poverty may promote greater hitchhiking transmission through more social contact in high density housing. It may also reflect more frequent contact with a population at higher risk from poor building management, increasing building-to-building transmission in low-income neighborhoods.

These findings can also be interpreted to support apartment-to-apartment transmission: for household predictors, the greater likelihood of infestation among higher poverty households may reflect the lack of resources, recourse, and self-efficacy of tenants to ensure effective building management (Messer, 2011). We found that building size is positively correlated with infestation risk with lower levels of infestation in 1–2 unit buildings. If points of egress for bed bugs (door jambs, pipes, or conduit) between apartments above, below, or adjacent have not been appropriately sealed, more bed bugs may travel within the building and between apartments. In these smaller buildings, introduction must come from outside or from only one adjacent apartment; in larger buildings a greater potential exists for risk from adjacent units. Larger buildings may have more transfer from common areas, such as lobbies or laundry rooms, or from other building features associated with unit count. Although unit count may be confounded by risk factors such as income, household size, and neighborhood, further examination of bed bug infestation by building type may identify building-level risks and offer guidance for methods of pest control.

Bed bug infestation was not statistically significantly associated with any health or mental health outcomes examined. Unlike cockroaches, which are known asthma trig-

gers (Arruda et al., 2001), bed bugs showed no association with asthma exacerbation. Although factors such as limited study power to detect a small effect or different pest control strategies from a higher perceived nuisance factor may hide an asthma episode risk, little evidence exists to support the likelihood of an association being masked by behaviors or study limitations. Our findings from a representative population-based survey did not support the findings from a previous case series of 11 bed bug–infested households that suggested a possible association with asthma (Abou Gamra et al., 1991).

Our findings do suggest other potential health disparities that could result from this distribution of infestation. For example, in low-income housing, more infestations may augment the burden of pesticide exposure. While families with children under six were not at elevated risk, they did report a high prevalence of infestation, and young children are vulnerable to substantially greater health risks from improper pesticide use (Lu, Batt, Pearson, Walker, & Bravo, 2009; Turner, Wigle, & Krewski, 2010).

Our study had a number of limitations. Cross-sectional data limit conclusions about temporal order of measures. Characteristics such as age, poverty, and children's ages likely predate our measure of infestation in the past year; however, health and mental health outcomes may have occurred concurrent with, or prior to, infestations. Any effects of infestations in prior years were not captured, and outcomes with some latency could be underestimated. Asthma in particular is usually diagnosed before adulthood, and we have no data on incidence of new asthma among children in the respondents' households. Some infestations reported here may represent ongoing infestations, which may have different distribution and health outcomes, and risks related to pesticide use may depend both on cumulative exposure and time.

Our analysis relied on self-report to estimate infestation prevalence. Bed bugs are small, hide during the day, and change appearance in different life stages. This could lead to misidentification, which might be differential within subgroups (Reinhardt, Kramplic, Naylor, & Siva-Jothy, 2009). Media coverage may influence bed bug identification (Anderson & Leffler, 2008). Subpopulations may report differently due to stigma or to specific preserving health concerns. Bite sensitivity may also influence bed bug reporting, and population prevalence and distribution of bite sensitivity is largely unknown. Nevertheless, self-report may be the best measure of the impact of the bed bug resurgence; for example, some individuals with true infestations may experience less anxiety or stress from bed bugs than others who are not infested but fearful of infestation. As more information becomes available, self-report may prove to be an accurate marker of infestation levels.

Our survey was also limited because it qualified infestations as those requiring an exterminator, and factors such as cost, experience, cultural norms, and overall health

TABLE 2

Demographic Neighborhood and Behavioral Characteristics as Predictors of Self-Reported Bed Bug Infestation Requiring Extermination in Past 12 Months, 2009[a]

Demographic	Unadjusted	Adjusted Model
	OR (95% CI)[b]	aOR[c] (95% CI)
Age (ref. = 65+)		
18–24	***3.2 (2.0, 5.2)***	***2.0 (1.1, 3.8)***
25–44	***2.3 (1.7, 3.1)***	***1.8 (1.1, 2.8)***
45–64	***1.5 (1.1, 2.1)***	1.3 (0.8, 2.0)
Race/ethnicity (ref. = Caucasian, non-Hispanic)		
African-American, non-Hispanic	***2.0 (1.4, 2.9)***	1.3 (0.8, 2.0)
Hispanic	***3.1 (2.2, 4.3)***	1.2 (0.8, 2.0)
Asian	1.7 (0.93, 2.8)	1.5 (0.8, 2.7)
Nativity (ref. = U.S. born)		
Foreign born	***1.8 (1.3, 2.2)***	0.9 (0.6, 1.3)
Poverty status (ref. = >200% federal poverty level [FPL])		
<200% FPL	***3.6 (2.7, 4.9)***	***2.8 (1.8, 4.5)***
Neighborhood poverty status (ref. = low poverty)		
Medium poverty	***1.9 (1.3, 2.8)***	1.2 (0.7, 1.9)
High poverty	***3.7 (2.5, 5.5)***	***1.9 (1.1, 3.1)***
Units in building (ref. = 50+ units)		
1–2	***0.5 (0.4, 0.8)***	***0.4 (0.3, 0.7)***
3–9	***1.6 (1.1, 2.4)***	1.1 (0.7, 1.6)
10–49	***1.4 (1.0, 2.1)***	1.0 (0.6 1.5)
Children <6 yrs. (ref. = none)		
One	***1.6 (1.1, 2.3)***	1.0 (0.6, 1.6)
Two or more	***2.5 (1.6, 3.8)***	1.7 (0.95, 3.0)
Children 6–12 yrs. (ref. = none)		
One	1.5 (0.98, 2.2)	1.0 (0.7, 1.6)
Two or more	***2.1 (1.3, 3.4)***	1.2 (0.6, 2.1)
Children 13–17 yrs. (ref. = none)		
One	***1.7 (1.1, 2.5)***	1.5 (0.96, 2.4)
Two or more	0.9 (0.5, 1.6)	0.7 (0.3, 1.4)
Number of adults (ref. = one)		
Two	1.2 (0.8, 1.6)	1.1 (0.7, 1.5)
Three or more	***1.8 (1.3, 2.5)***	***1.6 (1.1, 2.4)***
Number of sexual partners (ref. = none or one)		
Two or more	***1.7 (1.1, 2.4)***	***1.8 (1.01, 2.8)***

[a]Weighted, and accounting for stratified sample. Significant associations in bold and italics.
[b]OR (95% CI) = odds ratios, 95% confidence interval.
[c]aOR = adjusted odds ratios.

TABLE 3

Unadjusted and Adjusted Models of Predicters of Nonspecific Psychological Distress (NSPD) and Depression Including Self-Reported Bed Bug Infestation, 2009[a]

Characteristic	NSPD		Depression Ever	
	Unadjusted	Adjusted Model 1	Unadjusted	Adjusted Model 1
	OR (95% CI)[b]	*aOR[c] (95% CI)*	*OR (95% CI)*	*aOR (95% CI)*
Bed bugs (yes vs. no)	***2.2 (1.5, 3.4)***	***1.5 (0.8, 2.4)***	***1.6 (1.1, 2.1)***	***1.4 (0.96, 2.0)***
Age (ref. = 65+)				
18–24	0.8 (0.4, 1.6)		***0.5 (0.3, 0.8)***	1.1 (0.6, 2.0)
25–44	1.1 (0.8, 1.5)		0.9 (0.7, 1.1)	***2.0 (1.4, 2.9)***
45–64	1.3 (1.0, 1.8)		***1.4 (1.1, 1.7)***	***2.9 (2.1, 3.9)***
Race/ethnicity (ref. = Caucasian, non-Hispanic)				
African-American, non-Hispanic	1.1 (0.7, 1.6)		***0.5 (0.4, 0.6)***	***0.4 (0.3, 0.5)***
Hispanic	***1.7 (1.2, 2.3)***		***0.8 (0.7, 1.0)***	***0.7 (0.5, 0.9)***
Asian	1.3 (0.8, 2.3)		***0.4 (0.3, 0.6)***	***0.5 (0.3, 0.8)***
Poverty status (ref. = ≥200% federal poverty level [FPL])				
<200% FPL	***3.1 (2.2, 4.3)***	***2.2 (1.3, 3.6)***	1.3 (1.1, 1.6)	1.6 (1.2, 2.1)
Education (highest grade) (ref. = college graduate)				
Less than high school	***2.9 (2.0, 4.2)***	1.4 (0.9, 2.3)	1.2 (0.9, 1.5)	***0.6 (0.4, 0.8)***
Grade 12/GED	***1.5 (1.0, 2.2)***	0.8 (0.5, 1.3)	0.9 (0.7, 1.1)	0.9 (0.7, 1.3)
Some college	***1.7 (1.1, 2.6)***	1.1 (0.7, 1.8)	1.5 (1.1, 2.0)	0.8 (0.6, 1.0)
U.S. born (no vs. yes)	1.2 (0.9–1.6)		***0.6 (0.5, 0.8)***	***0.6 (0.5, 0.8)***
Neighborhood poverty status (ref. = low poverty)				
High poverty	1.4 (1.0, 2.0)		1.1 (0.9, 1.3)	
Medium poverty	1.2 (0.9, 1.5)		0.9 (0.7, 1.1)	
Units in building (ref. = 50+ units)				
1–2	***0.6 (0.4, 0.8)***	0.9 (0.6, 1.4)	***0.5 (0.4, 0.7)***	***0.7 (0.5, 0.9)***
3–9	1.1 (0.8, 1.7)	1.1 (0.7, 1.8)	0.8 (0.6, 1.0)	0.9 (0.7, 1.2)
10–49	0.9 (0.6, 1.4)	***0.7 (0.4, 0.97)***	0.9 (0.7, 1.1)	0.9 (0.6, 1.2)
Children <6 yrs. (ref. = none)				
One	0.9 (0.6, 1.4)	0.9 (0.6, 1.3)	0.8 (0.6, 1.1)	0.9 (0.7, 1.4)
Two or more	***0.4 (0.2, 0.8)***	***0.4 (0.2, 0.8)***	***0.5 (0.3, 0.8)***	***0.5 (0.3, 0.9)***
Children 6–12 yrs. (ref. = none)				
One	1.1 (0.7, 1.8)		0.9 (0.7, 1.2)	
Two or more	1.0 (0.5, 2.0)		0.8 (0.5, 1.2)	
Children 13–17 yrs. (ref. = none)				
One	0.9 (0.6, 1.4)		0.9 (0.7, 1.2)	
Two or more	1.0 (0.6, 1.9)		***0.6 (0.4, 0.97)***	
Number of adults (ref. = one)				
Two	0.8 (0.6, 1.1)		***0.7 (0.6, 0.8)***	***0.7 (0.6, 0.9)***
Three or more	1.0 (0.7, 1.4)		***0.6 (0.4, 0.7)***	***0.7 (0.5, 0.9)***
Number of sexual partners (ref. = none or one)				
Two or more	1.5 (0.9, 2.3)		1.3 (0.97, 1.7)	
Insurance type (ref. = Medicaid/Family Health Plus)				
Private	0.3 (0.2, 0.4)	***0.6 (0.3, 0.97)***	***0.5 (0.4, 0.6)***	1.2 (0.8, 1.8)
Medicare	0.6 (0.5, 1.1)	0.9 (0.6, 1.4)	1.0 (0.8, 1.3)	***0.5 (0.3, 0.9)***
Others	0.6 (0.3, 1.4)	0.8 (0.3, 2.0)	***0.6 (0.4, 0.9)***	***0.5 (0.4, 0.7)***
Uninsured	***0.6 (0.4, 0.96)***	0.7 (0.4, 1.1)	***0.4 (0.3, 0.6)***	***0.4 (0.3, 0.6)***

[a]Weighted, and accounting for stratified sample. Significant associations in bold and italics.
[b]OR (95% CI) = odds ratios, 95% confidence interval.
[c]aOR = adjusted odds ratios.

may have an impact on the use of pest control services. Lastly, New York City's population and housing stock is unique, diverse, and subject to local environmental characteristics and municipal policies that may have affected bed bug transmission and limit generalizability of these findings.

Despite possible reporting biases in our study, these findings may help evaluate and interpret other administrative data sources, such as New York City and other municipal levels of complaints and building violations.

Conclusion

Household and neighborhood-level poverty are associated with increased risk of bed bug infestations, suggesting that costs related to extermination may be an important barrier to pest control. As infestation may be transmitted among and within buildings; families living in disadvantaged neighborhoods with endemic control issues may be more heavily exposed to a greater reservoir of bed bugs, possibly furthering the high risk in an already burdened population and making neighborhood-level control more difficult. Building characteristics may play a role in transmission and should be investigated. Differentiated risk for younger ages and larger household size suggest a need for targeted community interventions and public education models.

Although no health or mental health outcomes including exacerbated asthma showed an association with infestation, differentiated prevalence, particularly among families with young children, may warrant targeted education around potential pesticide exposure. In future research, determining whether bite sensitivity is a confounder of infestation estimates may help validate self-reporting as a measure of infestation.

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GRADE: A

Geospatial Analysis Investigating the Relationship Between Gestational Diabetes and Walkable Access to Unhealthy Food Sources in Bronx, NY

[redacted]

GEP 620
December 12, 2012

ABSTRACT:

Gestational diabetes mellitus (GDM) has been linked to adverse pregnancy outcomes. As a nutrition-dependent outcome, GDM has been associated with modifiable behavioral factors such as diet and exercise. There is currently no research to date that investigates the clinical outcome of gestational diabetes mellitus and its relationship to unhealthy food accessibility in an urban setting at the patient level. This study proposes to assess the association between walkable access to unhealthy food sources and risk of GDM among a cohort of 4,843 obstetric patients residing in Bronx, NY that initiated prenatal care in the year 2010. Interactive software applications containing patient medical records were previously employed to develop this cohort. Walkable access will be defined as living 0.25 miles or less to an unhealthy food source and locations of stores or restaurants of interest will be obtained from multiple commercial databases (ReferenceUSA and Dun & Bradstreet). Street network distances from each patient's geocoded residence to the *nearest* unhealthy food source will be calculated through a geographic information system. The adjusted odds ratio of GDM as a function of distance to an unhealthy food source will be obtained through logistic regression in order to determine the effect of unhealthy food environment on gestational diabetes risk.

BACKGROUND:

Gestational diabetes mellitus, also known as GDM, is defined as glucose intolerance associated with or first observed during pregnancy.[1] It has been estimated that this disease complicates approximately 7% of all pregnancies, afflicting more than 200,000 women each year.[1,2] Because the medical definition of GDM does not account for the possibility of glucose intolerance prior to pregnancy, these figures can be controversial given that preexisting, unrecognized intolerance can lead to overestimation.[3,4] However, gestational diabetes mellitus is undoubtedly one of the most common complications of pregnancy with long-established

adverse maternal and fetal outcomes.[1-3,5] Furthermore, important, often modifiable, risk factors have been identified as protective and causal determinants of GDM.[1,3-8]

Women diagnosed with gestational diabetes have notably worse pregnancy outcomes as compared to women without GDM. Patients with severe gestational diabetes are at increased risk for IUFD or intrauterine fetal death during the last 4 to 8 weeks of gestation. Moreover, regardless of severity, all cases of GDM are more likely to result in fetal macrosomia or large-for gestational age (LGA) newborns (greater than 4000g). In addition, maternal health can also be comprised as GDM increases the prevalence of hypertensive disorders, such as preeclampsia, and the need for cesarean delivery. Of more serious concern, women with gestational diabetes have elevated risk of developing type 2 diabetes after pregnancy. Similarly, their offspring have a higher likelihood of becoming obese, and developing glucose intolerance and/or diabetes as adolescents.[1,3]

Gestational diabetes disproportionately affects certain populations. Therefore, the specific demographics of the population being studied are responsible for contributing to some of the variation among GDM statistics. Consequently, ethnicity, maternal age, parity (number of times a woman has given birth) and maternal birth weight serve as important unyielding risk factors. Both, maternal age and parity, demonstrate positive associations with gestational diabetes.[3,4,9,10] Interestingly, however, a mother's own birth weight seems to be inversely associated with her risk of GDM. Hence, the lower a woman's birth weight is as a newborn the greater her risk for gestational diabetes.[5] Ethnicity displays a more sporadic pattern as risk of gestational diabetes varies substantially across ethnic groups. GDM relative risk is higher for African Americans and Latino or Hispanic populations than for Non-Hispanic White populations. Further, South Central Asians demonstrate the highest risk. In general, foreign-born women have a higher prevalence of gestational diabetes as compared to US born woman.[8]

More importantly, body mass index (BMI), a modifiable factor, is arguably the most significant risk factor for gestational diabetes mellitus. As body mass index increases, the odds of having GDM concomitantly increases.[1,9,10] Consequently, diet, nutrition and exercise are important protective modifiers in the multi-causal web of GDM. Diets high in sugar content (glycemic load) and low in fiber are both positively correlated with disease. Specifically, the amount of dietary cereal and fruit fiber has proven to be extremely important in reducing risk, as a diet low

in both types of fiber is associated with more than twice the risk of developing GDM during pregnancy.[2] Accordingly, it seems likely that neighborhood food environment may influence the risk of complicating pregnancy with gestational diabetes as diet quality during pregnancy has been related to proximity to food sources.[11] Understandably, eating at unhealthy restaurants, such as fast food restaurants, is linked to high fat diets and increased BMI.[12] Likewise, in New York City, it has been proven that walkable access to unhealthy food stores is associated with higher prevalence of obesity.[13] Moreover, we predict that walkable access to unhealthy food stores in Bronx, NY will be positively correlated with increased risk of gestational diabetes mellitus.

Research Question:

Is walkable access to the *nearest* unhealthy food source associated with higher risk of having a pregnancy complicated by gestational diabetes mellitus in Bronx, NY?

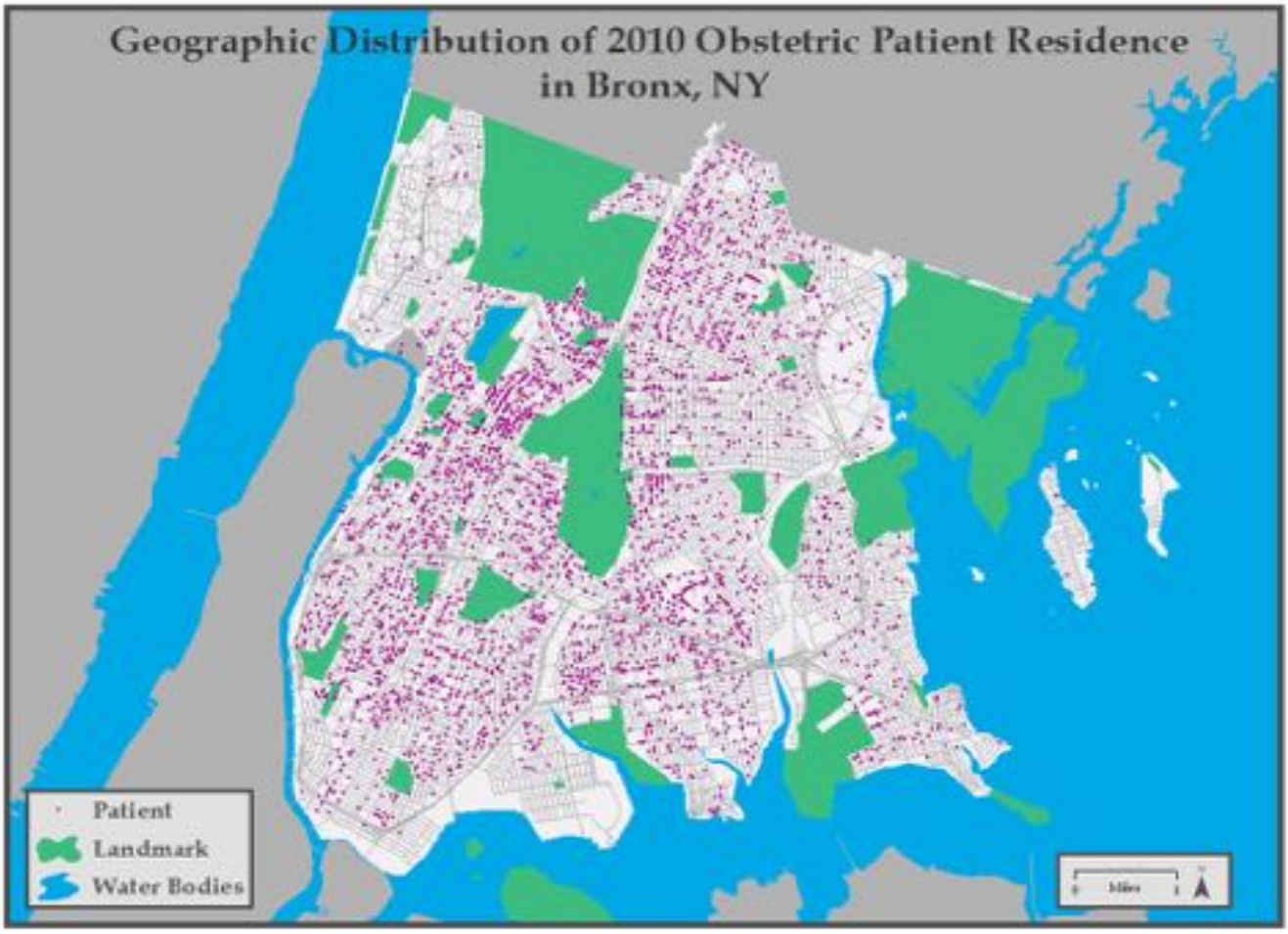
DATA SOURCES:

In order to test the validity of our hypothesis, answering our research question we have and/or need to obtain the following datasets:

Patient Data:

We have acquired a cohort of 4,843 patients, living in Bronx, NY, that delivered viable newborns at Montefiore Medical Center (Weiler Division) during 2010 from an interactive software known as Clinical Looking Glass (CLG). We used the Birth Report, a CLG application tool, to match mothers with infants born in our institution via medical record numbers, and to gather infant information such as birth weight, birth height, gestational age, and Apgar scores. In addition, AS ObGyn and EPF Web, two electronic charting systems, provided demographic characteristics and the prenatal course of our cohort as well as other relevant maternal and neonatal inpatient characteristics. Using this data, we spatially located our out-patient cohort by obtaining granular longitude/latitude coordinates through the CLG geocoding tool, which provides such values based on the patient's address recorded at first obstetric appointment (Figure 1).

Figure 1: Spatial Distribution of 2010 Montefiore Medical Center Patient Cohort



Unhealthy Food Store Data:

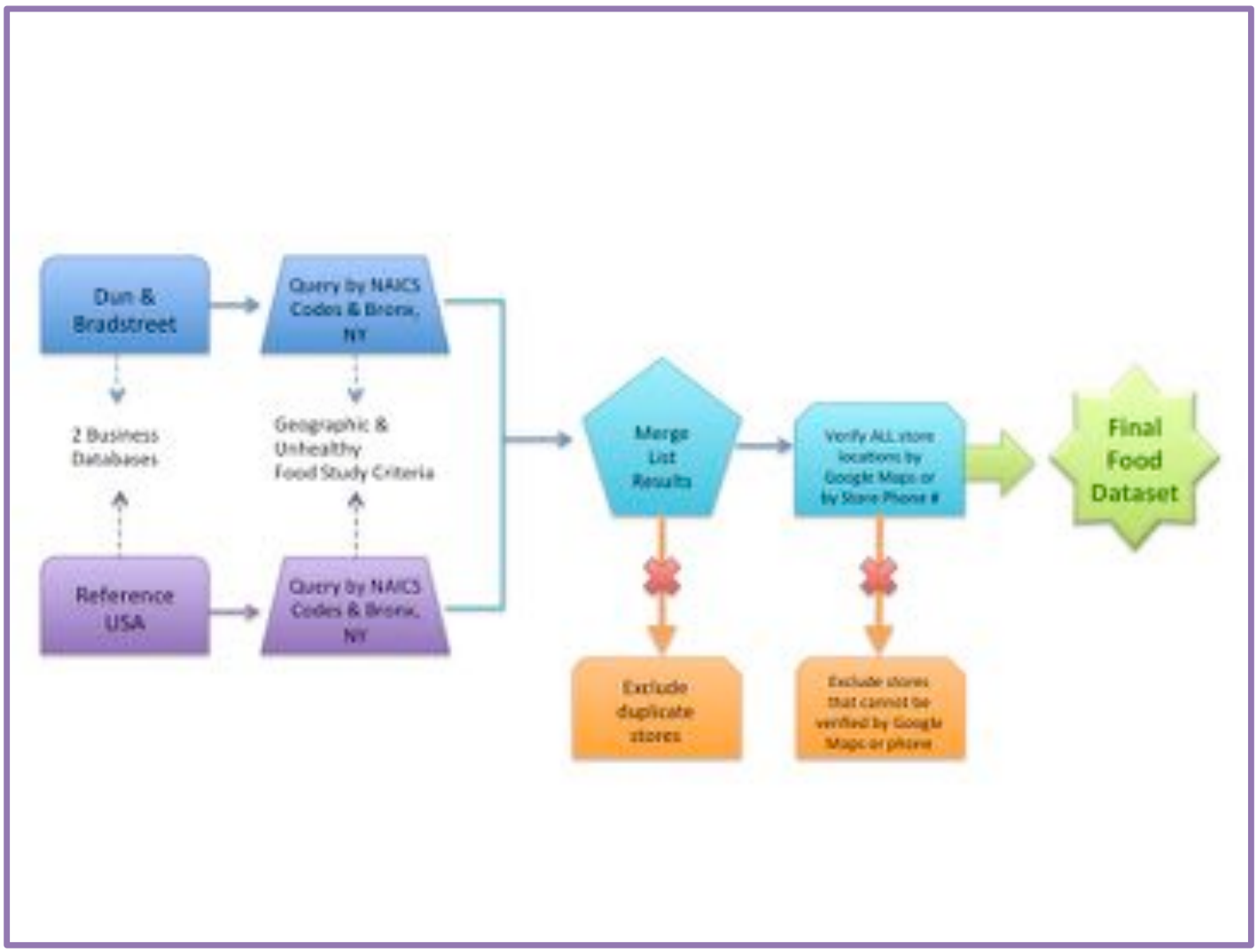
Reliable food source data within a given geographic locale can be cumbersome to obtain.[13,14] However, for a previous study (unpublished data Bottalico et al., 2012), we devised an exhaustive methodology to develop a complete healthy food source dataset for Bronx, NY. We will use a similar approach to compile an unhealthy food source dataset for this study (Figure 2). Based on previous studies,[13,15] we have defined unhealthy food sources as fast food restaurants, snack & nonalcoholic beverage bars, bakeries and candy & nut stores and have subsequently identified their respective North American Industry Classification System or NAICS code (Table 1).

Table 1: Defining Unhealthy Food Stores by NAICS code

Unhealthy Food Store	NAICS Code	Example
Fast Food Restaurants	722513	McDonald's, Domino's, Pizza Hut, KFC, Delis, Sandwich Shops
Snack & Nonalcoholic Beverage Bars	722515	Starbucks, Dunkin Donuts, Carvel
Bakeries	445291	LaSalle Bakery, Valencia Bakery
Candy and Nut Stores	445292	The Candy Box and Gelato Shop

We will use two commercial databases, Dun & Bradstreet and ReferenceUSA, to locate longitude/latitude coordinates, street addresses, and store phone numbers for all unhealthy food sources in Bronx, NY. Both databases will be implemented and queried by geographic boundary (Bronx, NY) and our 4 respective NAICS codes of interest (Table 1). We will also set our search criteria to include stores established by 2009 or earlier to be certain our derived food environment mimics a similar reality to that existing during the gestation period of our cohort. The list results will then be merged and duplicate stores as noted by matching coordinates or street address will be excluded. All stores will be verified by Google Maps street-view application or by store phone number. Stores that fail to be verified by either method will be excluded from the dataset and will be assumed to no longer exist. (See Figure 2)

Figure 2: Flow chart demonstrating method to develop our unhealthy food source dataset



Street Network:

Our street network dataset has been obtained from New York City Department of City Planning LION Road Network. This dataset will be clipped to only include road segments in Bronx, NY and will be modified to include only pedestrian accessible street segments.

METHODS AND ANALYSIS:

Our study will use the above-stated datasets to perform network analysis in order to determine the distance to the *nearest* unhealthy food source for each individual in our cohort of 4,843 obstetric patients and has been approved by the Montefiore Medical Center Institutional Review Board.

The same diagnostic criteria as per Montefiore protocol will be used to determine whether a patient has GDM. A one-hour 50-gram load glucose challenge test (GCT) is used as a screening test. If the GCT yields a value of 130 or greater, the patient then undergoes the 3-hour 100-gram glucose tolerance test (GTT). If at least two of the four GTT values are abnormal the patient is diagnosed with GDM. The GCT screening test is performed twice during gestation, once at the first prenatal visit and again between 24-28 weeks gestation. If the GTT results at either of these visits meet the above-stated criteria then the patient is considered to have a pregnancy complicated by gestational diabetes. This data along with other outcome variables of interest will be appended to the patient dataset.

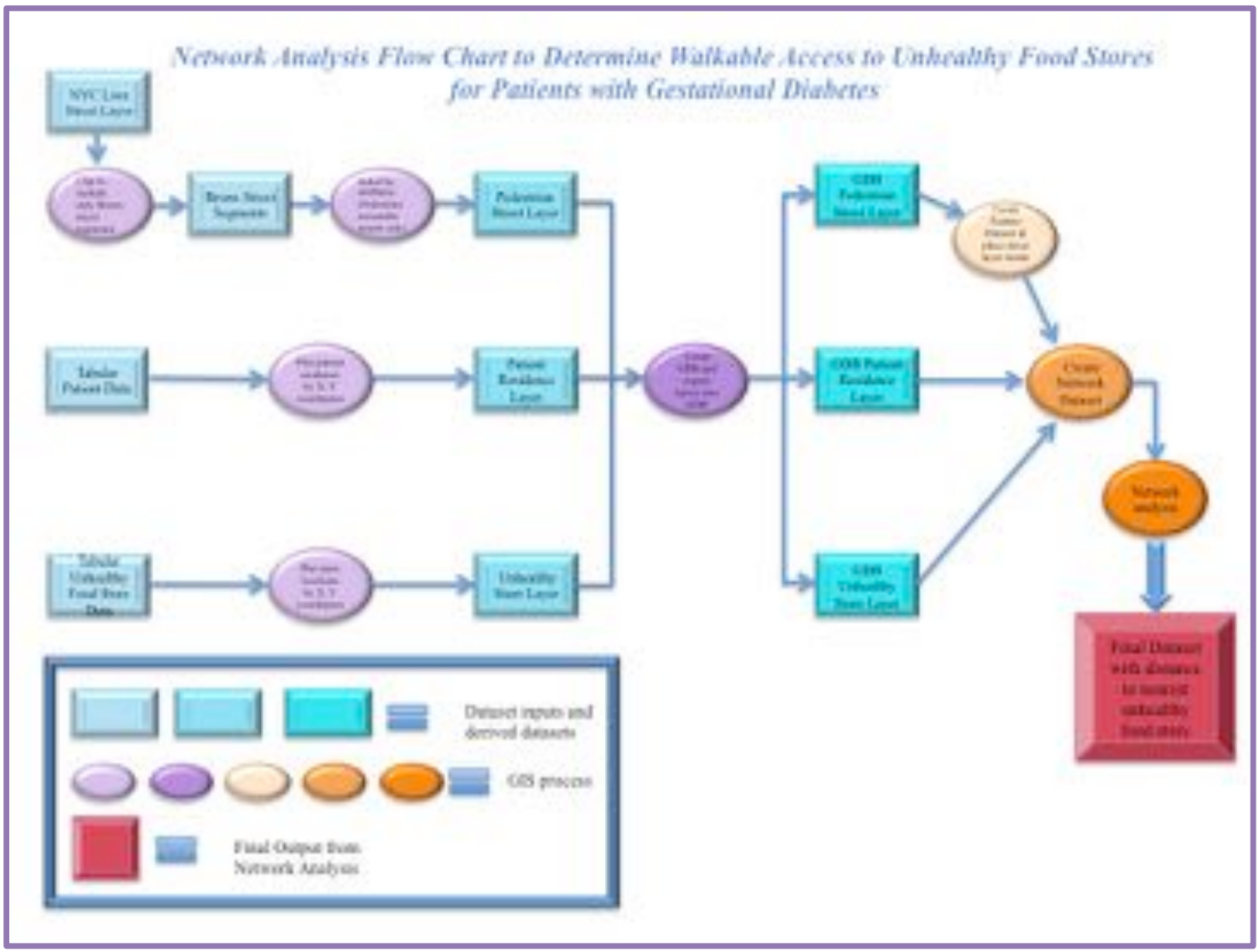
Tabular de-identified patient data containing ID numbers and x/y coordinates, unhealthy food store data and the street network dataset will be added to ArcGIS v10.0 software. Longitude/latitude (x/y) coordinates of our tabular data will be plotted accordingly. These plotted coordinates will then be exported into two separate layers (patients and unhealthy food store layers). Because the street network dataset spans NYC, the data will be clipped to include only segments in Bronx, NY. Additionally, we will select by attributes to include only pedestrian accessible streets. Selected attributes will subsequently be exported into a new street shapefile containing all pedestrian accessible street segments in Bronx, NY. A geodatabase will be created and the two layer files and one shapefile will be saved as *File and Personal Geodatase* features. All previous layers and shapefiles not within the geodatabase will be removed.

In order to create the network dataset, a feature dataset will be derived and the pedestrian street file will be imported. A new network dataset will then be created with the capability of modeling turns in street segments, but not elevation. Unhealthy food store locations from the respective file will be added as “facilities” and patient locations will be added as “incidents” in the network dataset. Network analysis will then be executed to determine the closest “facility” to each “incident.” In other words, distance in feet will be calculated to determine the nearest walkable path to an unhealthy food source for each patient. This distance will be converted from feet to equivalent miles and the resulting network dataset will be exported. We have defined walkable access as living 0.25 miles or less to an unhealthy food source. (See Figure 3)

Statistical Analysis

Exported de-identified patient data from ArcGIS will be merged with respective clinical data and inputted into SAS statistical software. Adjusted odds of gestational diabetes mellitus will be obtained through logistic regression in order to assess the effect of distance to unhealthy food sources as well as other relationships between covariables. The relationship between distance and GDM will be determined while controlling for variables such as race/ethnicity, maternal age, gestational age at first prenatal visit, parity, gravidity, spontaneous and elective abortions, type of insurance as well as others. We will also assess the relationship of interest conditioning on Medicaid/Uninsured patient status to serve as a proxy for socioeconomic status.

Figure 3: Network Analysis Flow Chart



Examining the literature:

Upon examining the literature, it is clear our study is novel in that we plan to merge granular clinical data mapped according to patient's street address with equally explicit data representing the unhealthy food environment of the patient's community. One such study investigated a similar relationship, specifically assessing the association between gestational diabetes and the general neighborhood food environment in New York City, in the absence of GIS software. However, no significant association was found. It should be noted that a substantially larger sample of patients were used, but only one commercial database was implemented (2001 Dun & Bradstreet) to define the entire food environment of the community. Unhealthy food was defined with similar subcategories, yet it was unclear how such subcategories were queried. Furthermore, patients were determined to have GDM based on ICD-9 coding rather than specific clinical indicators such as GTT testing. Patients and food sources were aggregated by census tract and logistic regression was performed controlling for covariables potentially modifying GDM risk. [6]

Two additional studies, interested in characterizing the neighborhood food environment, did employ spatial analysis software. Nevertheless, these studies also were ecological in nature. The first study, which we used as a foundation to develop our unhealthy food sources dataset (Figure 2), assessed the association between location of food stores and neighborhood characteristics by geocoding food stores to census tracts, estimating neighborhood wealth according to median value of homes, and determining the level of racial segregation by calculating the proportion of black residents. The local departments of environmental health and state departments of agriculture provided business addresses of food stores in the area of interest. Poisson regression was then used to determine the number of stores in relation to neighborhood wealth and racial composition. It was concluded that a larger number of supermarkets and convenience stores were located in wealthier neighborhoods comprising the study area. [15] The second study used the same methodology as the former ultimately determining that food environment is related to the prevalence of cardiovascular disease risk factors such as obesity, potentially lending support to our proposed hypothesis. [16]

Jeffery et al used a different approach to elucidate the association between food environment and obesity. Fast food restaurant locations were the independent variable of interest and were defined by Standard Industrial Code or SIC numbers. Both restaurants and participants were mapped at the street level and buffer analysis, rather than network analysis, was used to assess the

correlation between proximity of fast food restaurants and obesity. Spatial analysis was followed by logistic regression to control for underlying variables of impact. BMI of study participants was self-reported through telephone survey, serving as a proxy for obesity. This potential weakness in methodology may be linked to the null association. [12]

After applying a more rigorous analysis, Moore et al. were able to find a positive association between healthy diet and supermarket access. Once again, supermarket data was obtained from only one database, InfoUSA, and was queried by SIC code. Participants provided a questionnaire answering questions about their diet and were mapped by street address. Kernel density was performed using the Spatial Analyst extension of ArcGIS version 9.0 in order to calculate the density of supermarkets within 1 square mile of each participant's home. The density of supermarkets was weighted according to the Gaussian distribution to ensure supermarkets closer to participants' homes were weighted more heavily than distal ones. [17]

Impressively, Thornton et al analyzed the association even further, examining the individual consumption of fruits and vegetables and supermarket access using Euclidean buffers, road network buffers and kernel density analysis as described above. They even determined the optimal "walkable" distance for individuals without vehicles to be 0.25 miles. [18] Previously, this same network buffer distance was used to show that mobile food vending locations significantly affected children's negative eating habits after school hours in a predominately urban neighborhood. [19]

While 0.25 miles seems to be the optimal distance when interested in assessing walkable access to food stores, even larger road network buffers of 0.5 miles have been used to reveal the relationship between walkability to unhealthy food sources and obesity. One particular study derived their food dataset from the Dun & Bradstreet database querying by SIC codes. The same subcategories defining unhealthy food sources as described in our study (Table 1) were used. A positive association between obesity and such stores was shown by creating a 0.5-mile network buffer around each participant, highlighting all food sources of interest contained within the buffer. Density of store subcategories within each buffer was then determined and covariables were accounted for using multilevel modeling. [13]

RESEARCH SIGNIFICANCE:

More than 7% of women develop gestational diabetes mellitus during pregnancy, affecting greater than 200,000 women. Further, GDM is significantly associated adverse obstetrical and neonatal ramifications.[1,10] Despite efforts to control GDM through medication and improved nutrition in early pregnancy, the adverse effects of this glucose intolerance have wide-ranging implications for maternal and neonatal health.

The advent and implementation of mapping software is a relatively novel one, and has not yet been used to better understand obstetrical nutrition and gestational outcomes. Additionally, this study is unprecedented in that we have access to patient level clinical and demographic data as well as granular unhealthy food source data verified using an exhaustive approach. Our chosen geographic location, Bronx, NY, is equally important in that it is not only densely populated, but also contains a population with disproportionately higher percentages of minorities. Such populations have been shown to be at increased risk for development of GDM.[8,20] Furthermore, Bronx County suffers from much higher rates of poverty.[20] This is substantial as neighborhood wealth is positively associated with access to healthy food.[15] Therefore, developing a better understanding of the environmental factors involved in the development of gestational diabetes can ultimately help design interventions to more effectively address this public health need.

LIMITATIONS:

This study is not without limitations. As previously established, food environments can be extremely difficult to accurately define.[6,13] While we have developed a methodology to obtain a true, complete list of unhealthy food sources, there is no way to guarantee our model of the unhealthy food environment reflects the actual environment of our patients during 2010. Also, we have no way of measuring the mobility of our cohort throughout their gestational period. We are assuming the address self-reported at first prenatal visit is the primary residence of each patient during pregnancy. This could potentially lead to inaccurate network analysis measurements if individuals are mobile or moved during this period. Lastly, whether or not patients own or have access to a vehicle or use mass transportation as their primary means of travel may greatly impact these results. If, however, people purchase food primarily by walking, variables such as weather and neighborhood safety may also attenuate or enhance the observed relationship of interest.

FUTURE RESEARCH:

Based on our findings from the proposed study, additional research will be necessary to see if the observed effect can be replicated in other populations and spatial environments. We can enhance our knowledge concerning the impact of the environment on GDM by replicating this study with more rigorous tracking of patient's residence, and gathering information concerning ownership of vehicle(s) and/or public transportation use. Similarly, risk of gestational diabetes may be modified by incorporating weather patterns or seasonal changes as a variable within our model. With that said, it will also be intriguing to see if the same or inverse associations can be noted for other gestational outcomes. Future research will undoubtedly help us better understand the associations observed, thereby unveiling the true effects of environmental factors on gestational health.

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consumption? A case study from glasgow. *International Journal of Health Geographics*. 2012;11(1):29.

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04/06/2015

Assignment #3
Research Strategy: Approach (Part "C")

C. Approach

C.1. Overview of Project

Obstructive Sleep Apnea (OSA) is one of the most common sleep disorders, affecting2-4% of the adult population (Miljuš, Tihaček-Šojić, Milić-Lemić, & Andjelković, 2014). OSA has been linked as an independent risk factor for hypertension (Kapa, Kuniyoshi, & Somers, 2008) and stroke (Dyken & Im, 2009), and is estimated to be responsible for over 38,000 cardiovascular deaths yearly (Öğretmenoğlu et. al, 2005). Studies have shown that the incidence of OSA in patients with cardiovascular disease (CVD) is 30 to 50 percent (Tiengo, Fadini, & Avogaro, 2008; Torres-Alba et. al, 2013).

The proposed project will study the correlation between Obstructive Sleep Apnea (OSA) risk and CVD severity among a sample of 320 people living in New York City. The participants for the study will be selected from four primary care centers in four different and racially diverse neighborhoods in New York City. The sample population will be individuals aged 18 years or older who have cardiovascular disease and self-identify as one or more of the following racial/ethnic groups: White, non-Hispanic, Black/African American, non-Hispanic, Hispanic and Asian. OSA risk will be measured with the ARES Watermark questionnaire (which includes Epworth Sleepiness Scale) and the Berlin Questionnaire. These questionnaires will provide information on daytime sleepiness, hypertension, snoring and BMI, all of which are independent risk factors of OSA. Other surveys will be used to collect socioeconomic and demographic data. In addition to examining the relationship between OSA risk and CVD severity by racial/ethnic group, we will also study if factors such as low awareness of OSA, lack of access to care, and low socioeconomic status play a role in the risk of sleep apnea among the sample, including how these factors vary by race/ethnicity.

C.2. Recruitment of Participants

The participants for the study will be recruited from four different primary care centers in New York City. Each primary care center will be selected from a racially diverse neighborhood in order to recruit equal number of participants from each racial group. The neighborhoods for each racial group will be selected using data from US Census 2010 data. Using Epiquery, where the reports on neighborhoods and race from NYC Department of Health and Mental Hygiene were available using Census data, Borough Park was shown to have highest percentage of White, non-Hispanic population; Bed-Stuy has high percentage of Black, non-Hispanic population; West Queens has high Hispanic population and Flushing has high Asian, non-Hispanic population. One primary care center from each of these neighborhoods will be the recruitment sites for the participants. Each primary care center will recruit 80 participants. The inclusion criteria for the sample will be: age 18 years or older, residents of that area, with no history of sleep apnea or any other sleep disorder, having CVD (such as hypertension,

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- Beef up recruitment write up
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- Clarify measures and stats in data analysis plan

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stroke, arrhythmia, heart attack etc.), be the only member of the family participating in the study and consent to participate. The exclusion criteria for the study is: having a history of or existing sleep apnea or other sleep related disorder, being pregnant and impaired cognitive or functional ability.

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C.3. Study procedures

C.3.a. Recruitment and sampling procedure

The participants will be recruited at primary care centers. Surveys will be used to collect data and each participant will be paid $20 for their participation. All the surveys will have two copies of the consent form, one for the participant to keep and other to be attached with the completed survey. Both copies of the consent form will be signed by the participants before filling the survey. A total of 80 participants will be recruited from each racial group and each primary care center.

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C.3.b. Informed Consent

Participation in the proposed study will be completely voluntary. An IRB approved consent form will be attached to the survey. The participants will be required to read and sign the consent form before filling the survey. The consent form will include information about the study, the principal investigator, the goal of conducting the research study and criteria to be in the study as per the IRB rules for writing a consent form. The recruitment approach and data collection procedure will comply with the Health Insurance Portability and Accountability Act (HIPAA) laws that protect the privacy of patient's medical data and health information.

C.3.c. Quantitative Data Collection Procedures

The method used for data collection will be surveys. Along with surveys, neck measurement will be taken for each participant using a measuring tape which is required to complete scoring for risk apnea in ARES Watermark Questionnaire.

C.3.d. Incentives

All the participants will be paid $20 for their participation. After completion of the survey, participants will be given an information packet containing information about sleep apnea, how to identify symptoms of sleep apnea and some information on resources available in their community (such as nearest sleep centers etc.).

C.4. Measures.

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The measures used for data collection are: ARES Watermark Questionnaire, which includes the Epworth Sleepiness Scale, the Berlin Questionnaire and survey questions about demographics and socioeconomic status.

The Apnea Risk Evaluation System (ARES) Questionnaire will be used to identify people at risk of OSA. The questionnaire includes demographic and anthropometric data, diseases associated with OSA risk (i.e. History of stroke, hypertension, diabetes or any heart disease) or history of sleep apnea, the Epworth Sleepiness Scale, and frequency rating for snoring, waking

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up choking and witnessed apneas. The Epworth Sleepiness Scale included in the ARES questionnaire is an eight-item questionnaire that measures daytime sleepiness which is one of the most common symptom of sleep apnea. Using ARES questionnaire, individuals will be assigned as having “no significant risk,” “low risk,” or “high risk” of OSA. A study validating the ARES questionnaire has shown that ARES has a sensitivity of 0.94, specificity of 0.79, positive predictive value of 0.91 and negative predictive value of 0.86 (Levendowski et al, 2007).

The Berlin questionnaire is an 11-item questionnaire that includes questions about risk factors for sleep apnea, including snoring behavior, fatigue, and obesity or hypertension. The Berlin questionnaire is a validated instrument that is used to identify individuals who are at risk for OSA in primary and some non-primary care settings. The questionnaire was validated by Chung et al. in 2008. (Chung et. al, 2008).

The dependent variable for the study is OSA risk among people with CVD and the independent variables are demographics, race and socioeconomic factors (education, marital status, income, and employment).

C.5. Data analysis.

C.5.a. Data storage and cleaning, Quality Assurance

The collected data will be entered into SPSS and will be stored in a separate computer designated for use by OSA study coordinator and data manager. All the participants will be given a study Id or an alphanumeric identifier to ensure the safety of participant and the validity and integrity of the data. Such identifiers linking personal data to subjects will be maintained in a separate and secure file. The principal investigator, study coordinator and data manager will have access to the file containing personal information of the participants such as name, age, sex, address and contact information. The data will be coded and then entered into SPSS. Statistical analysis will be done using SPSS and data manager will assist the principal investigator in analyzing the data.

C.5.b. Data analysis to Achieve Aim 1

Hypothesis 1: Among CVD patients, CVD severity increases the risk of OSA.
The quantitative distribution of the variables will be expressed as descriptive statistics (frequencies, means and standard deviations, and range). Chi-square and independent t-test will be used to analyze the relationship between CVD and OSA risk among the sample.

C.5.c. Data analysis to Achieve Aim 2

Hypothesis 2: Among CVD patients, racial/ethnic minorities are at increased risk of OSA than white. Non-Hispanic patients..
To understand the correlation of race and risk of OSA, differences between groups in terms of level of OSA risk, age, neck size, etc., will be analyzed using ANOVA and correlation analysis.

References

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Chung. F., Yegneswaran. B., Liao. P., Chung. S.A., Vairavanathan. S., Islam. S., Khajehdehi. A., Shapiro. C.M. (2008). Validation of the Berlin questionnaire and American Society of Anesthesiologists checklist as screening tools for obstructive sleep apnea in surgical patients. Anesthesiology, 108:822–830.

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Revision Tracking Sheet (REQUIRED with every submission)

Name: _ Submission date: 04/06/2015

____ I affirm that, where applicable, all changes from the previous draft have been HIGHLIGHTED

Revision Tracking Sheet		
Date	Submission	Notes and/or overview of changes (including conceptual) from last submission
03/07/2015	Assignment#2	• The sample for the study is changed to people with CVD than the general population.
		• Literature to support the hypothesis have been studied and used in this draft.
		•
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Notes to reviewer concerning THIS submission:

A review of types of safer sex practices among adolescent and young adult females in the United States

A Paper Presented to the Faculty of the Department of Health and Nutrition Sciences

Brooklyn College

In Partial Fulfillment of the Requirements for the Degree of Master in Public Health

By:

2014

Abstract

Introduction

Sexually transmitted diseases (STDs) remain an international problem that disproportionally affects the adolescent and young adult population (East, Jackson, O'Brien, & Peters, 2007). Adolescence is defined as the years between 15 and 19 years old. According to World Health Organization (WHO), young adult refers to the overlap between adolescence and post adolescence between the years of 15 and 24 (East, Jackson, O'Brien, & Peters, 2007). Sexually transmitted diseases are infections that can be acquired through sexual activity with an infected partner (Centers for Disease Control [CDC], 2011; National Institute for Health [NIH], 2014). There are over twenty types of STDs (NIH, 2014). Herpes simplex virus type 2 (HSV-2), or genital herpes, hepatitis B (HBV), and human immunodeficiency virus (HIV) are all lifelong infections that make up about a quarter of STDs, but others can be treated and cured if detected and diagnosed (CDC, 2013).

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Female Adolescents and Young Adults

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Women may be less likely than men to have symptoms of STDs, or their symptoms may be less noticeable. For example, men may develop sores on their penises from STDs which are more visible than a genital ulcer inside the vagina (CDC, 2011a). Many adolescent females also have little knowledge of the symptoms of STDs allowing the disease to go undetected and thus undiagnosed (East, Jackson, O'Brien, & Peters, 2007). Health complications can affect men and women, but young women face the most serious long-term effects, including infertility (CDC, 2014). Other risks associated with untreated STDs include pain, cervical cancer, and pelvic inflammatory disease (Paterno & Jordan, 2012).

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Young women are at a higher risk for STDs and HIV due to biological, social, and behavioral factors. Women are more vulnerable to sexually transmitted diseases because of

higher rates of "cervical ectopy" (Chambers & Rew, 2003). Cervical ectopy is a common biological process that can occur during adolescence. "Cervical ectopy is thought to increase risk … by exposing columnar epithelium to a potential infectious inoculum" (Lee, Foley, & Tobin, 2006). Adolescent females are also at higher risk of for STDs because of typical gender roles in sexual relationships. Culturally, females may have less power to negotiate contraceptive and/or condom use (Chambers & Rew, 2003). A female's decision to not use a condom may be decided on her desire to please her partner. Female adolescents are also more likely to be coerced into a sexual activity than male adolescents (Chambers & Rew, 2003).

Predicting contraceptive use

In general, studies show that a multitude of variables predict whether or not an individual will practice safe sex. These variables include race, ethnicity, age, education, religion, age of sexual debut, parental views and, relationship status (Daniels, Mosher, & Jones, 2013; East, Jackson, O'Brien, & Peters, 2007). While virtually all sexually active women have stated that they have used at least one form of contraception at some point in time, many women still harbor misconceptions about contraception (Daniels, Mosher, & Jones, 2013).

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Often, adolescents do not realize there is a difference between contraceptive measures and safe sex. This age group often does not differentiate between the two and tend to believe that the terms are interchangeable (East, Jackson, O'Brien, & Peters, 2007). Despite the proven effectiveness of condoms against pregnancy and STI's, condom use remains low among both male and female adolescents. Unfortunately, male condoms only provide modest protection against pregnancy when compared to other forms of protection (Tyler et al., 2014). Conversely, non-barrier forms of protection such as oral contraceptives provide high protection against pregnancy, but do not provide any protection against STIs (East, Jackson, O'Brien, & Peters,

2007; Tyler et al., 2014). With any form of protection, it is imperative for use to be consistent and correct in order to achieve the highest level of effectiveness offered by the protective measure (Tyler et al., 2014).

Misinformation or lack of knowledge can inhibit condom use among adolescents. Many adolescents associate condom use only with pregnancy prevention. Holding true to that belief, once adolescents switch to contraceptives there is often a decrease in condom use among adolescents. Only one in six female adolescents use both condoms and another form of contraception (Chambers and Rew, 2003). Adolescents are often confused by the ambiguity of the terminology "safer sex" and "contraception". Safer sex applies to preventing the transmission of diseases as well as preventing unplanned pregnancy. Contraception only applies to avoiding pregnancy (East, Jackson, O'Brien, & Peters, 2007). The ambiguity leads to the misconception that even non-barrier contraceptives are safe sex practice. The CDC recommends abstinence and condom use as a preventive measure for adolescents (Chambers & Rew, 2003). While condoms provide protection against both STDs and unplanned pregnancy, the oral contraceptive pill, the most successful contraceptive, does not provide protection against STDs (East, Jackson, O'Brien, & Peters, 2007). One in five adolescents believes that an oral contraceptive pill is effective against the risk of STDs (KFF, 2013b).

With any form of protection, it is imperative for use to be consistent and correct in order to achieve the highest level of effectiveness offered by the protective measure. Research shows that adolescents are more inconsistent with safe sex measures than adults (Tyler et al., 2013). Another misconception among adolescents is regarding the uses of "withdrawal" and "delayed application of condoms." Over one third of sexually active adolescents that report condom use admit to not using a condom prior to any genital contact (de Visser, 2004). While this practice

may protect against pregnancy, it does not protect against STDs, and it is imperative for adolescents to understand the difference. As discussed previously, adolescents are more likely to use condoms for pregnancy prevention rather than protection against STDs. Since this population is using condoms to avoid pregnancy, their perceived risk of STDs is lower than it should be (de Visser, 2004). One third of adolescents engage in oral sex, yet only one in five adolescents believe that STDs can be transmitted through oral sex (KFF, 2013b). With this belief, adolescents engaging in oral sex are not using protective measures against STDs, such as condoms. Many adolescents feel that oral sex is a safer form of sex; in fact 13% of adolescents who have not engaged in sexual intercourse have had oral sex (KFF, 2013b).

While each form of protection exhibits its own merits, there is no form that can provide total protections on its own (Bearinger & Resnick, 2003). Since forms of contraception each carry their own benefits and risks, Healthy People 2020 encourages dual use protection among adolescents and young adults to create a more complete safer sex practice (HHS, Healthy People 2020, 2013). In order to achieve the highest rates of protection against both STIs and pregnancy, it would be prudent to encourage the dual use of condoms and non-barrier pregnancy protection. To understand how to achieve higher dual use rates in adolescent and young adult American females, we need decipher the factors associated with the various measures of safer sex practices.

Table 1.
Classification of types of safe sex practices

Category	Description
Condoms only	Male or female condom
Non-barrier only	-Hormonal methods (oral contraceptives, patches, injections, vaginal rings, emergency contraceptive

	pills) -implantable rods intrauterine devices
Dual Use	Male or female condom plus a non-barrier form of contraception (see above)
No protection	Includes withdrawal and fertility awareness based methods (ovulation tracking)

Background and Statistical Overview

STDs represent a serious public health problem, with an estimated prevalence of 110 million cases in the United States and an estimated 20 million new cases each year (Centers for Disease Control [CDC], 2014). In addition to the health consequences of STDs, there are also

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serious financial implications. The CDC estimates that STDs cost the United States about $16 million per year in healthcare costs (2014). Moreover, the actual prevalence rates of some STD cases likely surpass the numbers reported by the CDC, due to undiagnosed cases and STDs such as human papillomavirus (HPV) and genital herpes that are not reported to the CDC. (CDC, 2013).

In the United States, almost half of the new cases of STDs occur among adolescents and young adults aged 15-24 years old (CDC, 2013). Every year approximately one in four sexually active 15-24 year olds will contract some type of STD (Kaiser Family Foundation {KFF}, 2013a). Young adults and adolescents aged 15-24 years old account for 26% of newly reported cases of HIV mostly acquired through sexual contact (KFF, 2013b).

Aside from their high risk for STDs, female adolescents in the United States are also at a high risk for unintended pregnancy. In 2009, the birth rate among U.S. teens decreased to 39.1 births per 1,000 females, a 37% decrease from the birth rate of 61.8 per 1,000 females in 1991. Despite the decline in adolescent pregnancy, the United States still has the highest rates in the developed world (Chambers & Rew, 2003). In fact, the teen birth rate in the United States is as much as nine times higher than other developed countries (CDC, 2011b). Teen pregnancies account for roughly 10% of births in the United States (Patel & Sen, 2012). One in four of non-marital births in 2004 occurred among adolescent females (Basch, 2011).

Among white teens, the birth rate was reported as 25.6 per 1,000 females (CDC, 2011c). African American and Hispanic women still report higher rates of unintended pregnancy than white women (Paterno & Jordan, 2012). In 2009, the birth weight for black teens was 59 per 1,000 females and 70.1 per 1,000 females among Hispanic adolescents (CDC, 2011c). Teen pregnancies in the United States are associated with high economic and social costs. The total

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U.S. government expenditure of teen pregnancy was $11.3 billion in 2006 (Patel & Sen, 2012). Births born by adolescents are more likely to have lower birth weight and higher rates of death in infancy than seen in pregnancy from adults (CDC, 2011c). Teen mothers also experience adverse effects. Studies indicate strong associations between teen pregnancy and low employment, low levels of education, and low socioeconomic status among teen mothers (Patel & Sen, 2012). Teens that become pregnant are less likely to finish high school and college. Children born to teenage mothers are also more likely to become teen moms themselves (Basch, 2011).

Racial and Ethnic Differences

Little research exists on the sexual practices of Asian/Pacific Island adolescents, but adolescents of other races and ethnicities tend to have higher rates of STDs and pregnancy than Asian and Pacific Island adolescents. It is important for researchers to further assess the sexual behavior of Asian and Pacific Island adolescents, as Asian and Pacific Islanders are one of the fastest growing populations in the United States (Schuster, Bell, Nakajima, & Kanouse, 1998). Research indicates that white adolescents are 2.3 times more likely to communicate about STDs than Asian adolescents. Asian adolescents may be a more vulnerable and harder to reach population than white adolescents (Hou & Basen-Engquist, 1997).

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According to the 2011 Youth Risk Behavior Survey (YRBS), about half of (47.4%) of American high school students have engaged in sexual intercourse (CDC, 2011c). Among females, black students are more likely to engage in sexual intercourse (58%) than white (45%) and Hispanic (45%) adolescents. For male students, black adolescents (72%) reported the highest rates of sexual intercourse, when compared to Hispanic (53%) and white (40%) students (CDC, 2011c). Overall, there was a decrease in sexual intercourse among male and female

students, but there was no decline among white female students, Hispanic female students, or Hispanic male students (CDC, 2011c). As stated previously, data regarding sexual activity among Asian adolescents is limited, but studies do show Asian American adolescents have lower involvement in sexual activity than other races (Tosh & Simmons, 2007). A survey of California students found that 27% of Asian American students had ever engaged in sexual intercourse, compared to 50% of white students. While involvement in sexual intercourse may be lower among Asian American adolescents, once engaged in sexual behavior Asian Americans tend to engage in similar behaviors as other ethnicities. For example, the uses of alcohol during sex as well as rates of condom use have been reported as comparable to the rates among other ethnicities (Tosh & Simmons, 2007).

Adolescent Risky Behavior

Adolescents place themselves at a higher risk for STDs because of their risky sexual behaviors (CDC, 2011b). These behaviors include engaging in unprotected sex, having multiple partners, partaking in sexual activities with risky partners, early sexual debut, alcohol abuse, and substance abuse (Chambers & Rew, 2003; Polacek, Coker, Lewis, Minter, Viela-Perez, & Scott, 2008). Early sexual initiation is also associated with high numbers of lifetime sexual partners (Tosh & Simmons, 2007). 26% of female students report having more than one sexual partner. 11% of high school students report having more than four sexual partners (KFF, 2013a). Many adolescents judged their partners' risk of transmitting disease by his/her physical attributes. That is, if an adolescent felt a potential partner seemed "clean", the adolescent used that determination as an indicator of risk (East, Jackson, O'Brien, & Peters, 2007). One in five adolescents believe they would "just know" if their partner had an STD (KFF, 2013b). Adolescents often engage in sexual behavior with risky partners. For example, an adolescent female who engages in sexual

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intercourse with a partner who used drugs or alcohol beforehand was less likely to use a condom (Staras, Livingston, Maldonado-Molina, & Komro, 2013). As male condom use remains inconsistent, the rates of STDs continue to rise (East, Jackson, O'Brien, & Peters, 2007).

STD risks for adolescents

Even though abstinence is the most reliable way to avoid STDs acquired through sexual intercourse, latex condoms have proven to greatly reduce the risk of STDs when used correctly and consistently (CDC, 2013). Reports of condom failure are usually due to incorrect use such as condom breakage, slippage, or leakage. Condom users also need to understand that it is imperative to use a condom throughout the entire sexual act in order to further reduce the risk of STDs (CDC, 2013). Despite the proven effectiveness of condoms, of the adolescents who have had sex in the past month, one in four males and about one in ten females did not use a condom (Department of Health and Human Services [HHS], 2013). According to the 2011 YRBS, 12.9% of American high school students did not use any sort of contraception in their last sexual encounter (CDC, 2011c). The rates of condom use among adolescents decrease across grades. Bach's study reveals condom use decreased from 69.3% amongst 9th grades to 54.2% amongst 12th graders (Basch, 2011) . These statistics indicate the continued public health problem affecting this population and further enforces the importance of understanding the predictors of safer sex practices.

In order to decrease the rates of STDs and unintended pregnancies among the American female adolescent population, it is imperative to understand who is using which forms of sexual protection and why. Despite the associated risks of unprotected sex, adolescents continue to engage in sexual behaviors without a method to protect against pregnancy or sexually

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transmitted diseases (Peterno & Jordan, 2011). Understanding the factors behind safer sex practice decisions can help to create effective sexual health interventions for adolescents and young adults. Knowing why young women do not use preventive measures could help health educators prevent unintended pregnancies and STDs (Paterno & Jordan, 2007). The factors behind safer sex practices range widely from demographics to social issues.

Much of the previous research has been focused on condom use as an indicator of safer sex practices, but Healthy People 2020 encourages dual use protection among adolescents. Dual use is defined as combining the use of a condom with a form of hormonal contraception such as oral contraceptives (Morroni, Heartwell, Edwards, Zieman, & Westhoff, 2014). As stated previously, no one type of contraceptive provides full protection against both STDs and pregnancy, which is why dual use is now being recommended (Tyler et al., 2014). Since the adolescents in the United States report lower dual use than other developed countries, it is important to understand the factors behind each type of contraceptive – including no protection, condom use only, non-barrier protection only -- to properly address the issues that may affect dual use.

Methodology

A literature search was conducted using peer-reviewed articles gathered from online databases as well as statistical reports collected from government and foundation websites for my research. I performed my search using key words such as “condoms,” “adolescent condom use,” “predictors of condom use,” “risky sexual behavior and adolescents,” ” parental views on condom use,” ” rates of STDs,” “oral contraceptives and adolescents,” “dual use and adolescents,” and “sexual education”. My search has been limited to English language only

publications published primarily between 1997 and 2014. The search was not limited to studies in the United States, in order to ascertain if adolescents and young adults were adversely affected in the U.S. as compared to other countries. Studies that focused primarily on males and adults over the age of 24 were excluded. Overall 28 studies were reviewed.

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Findings

This paper explored the differences amongst female adolescents and young adults, ages 15 to 24 years of age, who choose various forms of protection for safe sex practices. In a review of 28 research articles, I examined the attributes of female adolescents and young adults who use contraception within the following four categories: no protection, condoms only (e.g. male and female condoms), non-barrier protection only (e.g. oral contraceptives, intrauterine devices, and shots), and dual use, i.e., condom and non-barrier protection together. As shown in Table 2, demographic and social factors associated with each category of contraception were examined.

Condom use only

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Condoms refer to the use of either male condoms or the less popular female condoms. Condom use among adolescents and young adults is important in preventing against the spread of STDs (Tyler et al., 2014). Sixteen studies focused on condom use among adolescents and young adults. Most research showed condom-only practices were most prevalent among the adolescents and young adolescents. While condoms do afford protection against both STDs and pregnancy, the protection against pregnancy is quite modest. Condoms have 2% pregnancy rate when used ideally and up to a 17.4% pregnancy rate when used typically (Brown, Hennessy, Sales, DiClemente, & Salazar, 2011; Ott, Adler, Millstein, Tschann, & Ell, 2002; O'Leary, 2011). Since the condom is a proven form of contraception that also protects against sexually

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transmitted diseases (Witte, Stefano, & Hawkins, 2010), it is important to understand what makes individuals more likely to practice appropriate condom use.

Demographic factors. Certain demographic factors can have an effect on the likelihood of condom use among adolescents and young adults. These factors include race/ethnicity, religion, and socioeconomic status (Manlove, Ikramullah, & Terry-Humen, 2008; Paterno & Jordan, 2012). For example, according to the 2011 YRBS, 34.7% of African American adolescents reported not using a condom in their last sexual encounter, where as 41.6% of Hispanic adolescents reported not using a condom. The YRBS also stated that 40.5% of White adolescents and 33.8% of American Indian/Alaskan adolescents reported not using a condom. The percentage of Asian adolescents not using a condom was reported as N/A in the YRBSS (CDC, 2011c). While none of the previously stated percentages are desirable, it is clear that there are discrepancies in condom use among various populations. According to Manlove, Ikramullah, and Terry-Humen, African Americans adolescents report higher condom use. This could be attributed to greater communication between parents and children regarding sex (2008). Research also indicates that non-white women are more likely to acquire an STD (Paterno & Jordan, 2012) and first generation Hispanic adolescents are only half as likely as white adolescents to report consistent condom use (Manlove, Ikramullah, & Terry-Humen, 2008). Adolescents and young adults who are either African American or Hispanic were more likely to use condoms alone if compared to white adolescents (Tyler et al., 2014; Cavazos-Rehg, 2010).

Perceived risk. An important factor of condom use among adolescents and young adults was the perceived risk of STDs. Those who reported a high self perceived risk of STDs continued to report consistent rates of condom use (Ott, Adler, Millstein, Tschann, & Ellen, 2002). When a female felt there was a high risk of STD, she was more likely to use a condom

Commented [A18]: I feel like this can be moved up somewhere – maybe somewhere where you are telling me about condoms in general.

Remember that your results section should only have results in it! It is often the shortest section of a paper.

Commented [A19]: Throughout: I am not clear when you are talking about both male and female or just female.

Commented [A20]: Are you going to talk about these other variables?

Commented [A21]: Were the differences found to be statistically significant?

Commented [A22]: Doesn't this contradict your previous finding? It's fine if it does, but just say some blanket statement like, "Among adolescents, racial and ethnic differences have been found in relation to rates of condom usage, however these findings are inconsistent."

during sex. Partner type is also a significant factor in condom use among female adolescents. Research indicates that female adolescents and young adults are more likely to use condom only protection with casual partners (Tyler et al., 2014).

Health insurance and education were also significant variables among females who use condoms only. Those with no health insurance were more likely to use condoms only. This may be due to a lack of access to prescriptions (Tyler et al., 2014). Adolescents who are looking for low cost measures of protection also report condom only use (Cavazos-Rehg, 2010). Females with less than a 12th grade education were also more likely to report condom only use over dual use. The research did not implicate reasons for this finding, but education did seem to be a consistent factor across various studies.

Partner type. Another factor related to condom-only use included females entering into new relationships. Females who did not yet trust their new partners used condoms more than those in steady relationships. Overall trust is an important issue in female adolescents deciding to use a condom. Those who report high levels of trust felt that they no longer needed to use a condom (Roye, 2001). Another interesting factor associated with condoms-only use was found among females without previous pregnancies. Females who were never pregnant were more likely to use the condom-only method over dual use methods (Tyler et al., 2014).

Current age and age of sexual debut also play a role in females using only condoms for safer sex protection. Younger adolescents may be more likely to use condoms only than other forms of contraception. Some studies indicated that those between 15-19 were more likely to use condoms only when compared to older adolescents. Other studies showed that those less than 17 were more likely to use condoms only (Tyler et al., 2014; Ott, Adler, Millstein, Tschann, Ellen, 2002). Generally, those towards the younger end of the 15-24 year old age range are more likely

Commented [A23]: Is this a proxy for age?

Commented [A24]: I don't know if this should do under demographics, or get their own subsection or what.

Commented [A25]: Again, you are pairing these so I am not sure what to call this in the level 3 heading. Maybe just "Current age and age of sexual debut"?

to use condoms only. Those who initiated in sexual intercourse at a later age seemed to use only condoms for protection. Tyler et al. (2014) found that those who were 18 or over at sexual debut used condoms only as their regular form of protection. Adolescents who used a condom at their sexual debut were also more likely to consistently use condoms during later encounters than those who did not use a condom at sexual debut (Shafli, Stovel, & Holmes, 2007).

No protection

No protection is unprotected sex, but can include the use of methods that do not provide effective protection against STDs and pregnancy. Withdrawal, also known as the pull out method is considered in the no protection category. Despite the high levels of risk faced by adolescents, many still forgo protective measures. No protection is often associated with incorrect beliefs among adolescents and young adults. Many factors can contribute to unprotected sex among adolescents and young adults. Very often the lack of protection can be related to a partner's beliefs. According to the CDC YRBSS, while 35.2% of female adolescents were sexually active, 15.7% did not use any form of protection (CDC, 2013c).

Demographic factors. Higher rates of unprotected sex have been associated with Hispanic adolescents and young adults (Committee of Adolescent, 2013; Cavazos-Rehg, 2010). According to 2013 YRBSS, 23.7% of Hispanics, 21.2% of blacks, 11.9% of whites, and 13.7% of those with multiple races participated in unprotected sex. The survey did not provide statistics for Asians, Native Americans, or Native Hawaiian/other Pacific Islanders because the subgroup sizes were too small to produce significant findings (CDC, 2013c). Lower socioeconomic status may be associated with higher rates of risky sexual behavior among adolescents, which includes not using protection during sex (Manlove, Ikramullah, & Terry-Humen, 2008). Rates of unprotected sex are lowest among those with some college education (Tyler et al., 2014).

Commented [A26]: Move all this. You are interpreting in the results section and you shouldn't do that.

Commented [A27]: Not sure how to make this match the table, where SES isn't epresented.

Commented [A28]: What is this source?

Formal and informal sexual education. Research by Manlove and associates indicates that lack of any type of sexual education may lead to lower rates of condom use among adolescents. Statistically, adolescents who did not receive formal sex education were two times less likely to use a condom at sexual debut (Manlove, Ikramullah, & Terry-Humen, 2008; Committee on Adolescence, 2013). Poor timing of parental sex discussions has been associated with lower rates of safer sex protection. Maternal discussions about condom use prior to an adolescent's first sexual encounter may lead to a higher likelihood of prolonged condom use, but sex discussions that occur after sexual debut did not prove to be significant (Millier, Levin, Whitaker, & Xu, 1998). This finding implies the importance in the timing of safe sex talks between parents and their children. Discussing sex is considered a private matter in the United States, and adolescents report that sex is the topic most avoided with their parents. Mothers who are not confident in their knowledge of sexuality and STDs communicate less effectively about condom use (Committee on Adolescence, 2013). Often adolescents feel that their parents will look down on them for discussing sexual matters. Some parents feel that they do not have the skill set to discuss such issues with their children and tend to shy away from this type of conversation (Afifi, Joseph, & Aldeis, 2008).

Commented [A29]: Will this go on the table?

Commented [A30]: So does not using condoms mean no protection?

Commented [A31]: Was the alternative no protection?

Commented [A32]: I feel like you have moved into interpreting the findings, which doesn't belong here.

Discussion

Commented [A33]: Don't forget to summarize your findings, and speak of strengths and weaknesses of the studies you analyzed.

Theory

Commented [A34]: Please use subheadings for each of the theories.

There are various external predictors that may lead adolescents to proper safe sex practices, but in cases of consensual sex adolescents still have the power to decide whether or not

to use protection. Ultimately, the adolescent chooses whether or not to practice safe sex. Various theories may help to better understand the reasons behind an adolescent's decision to engage in safer sex. Condom use is a cognitive decision and adolescents must be aware of the risks of pregnancy and STDs associated with unprotected sex (Chambers & Rew, 2003). Adolescents are all individuals facing a multitude of issues and circumstances. Many theories may be applied to help understand an adolescent's decision to use or continue using protection. Because of the distinct differences that range across the adolescent population, no one theory could definitively describe an adolescent's decision-making process. It is prudent to explore various theories in order to appreciate why an adolescent chooses to practice safe sex (Chambers & Rew, 2003).

Commented [A35]: Good segway! But add the other stuff about the external predictors before this.

The Conflict Theory of Decision Making offers an interesting perspective on an adolescent's decision to use condoms. Created by Janis and Mann in 1977, the Conflict Theory of Decision Making states making a decision consists of "choice, commitment, and conflict…and the potential for loss" (Chambers & Rew, 2003). Vigilant decision making is an important component of the Conflict Theory of Decision Making since the practice of safe sex is achieved through a chain of various decisions. Those who engage in vigilant decision making are able to process information thoroughly. Unfortunately, adolescents often make sexual decisions based on emotion and may not fully process the risks of unprotected sex. As stated earlier, the Conflict Theory of Decision Making encompasses the "potential for loss." Fear of loss can often misguide an adolescent when deciding whether or not to use a condom, particularly in females. For example, if a female is afraid that she will lose her partner because of her desire to use a condom, she may decide to forgo condom use to please her partner (Chambers & Rew, 2003). On the other hand, a female who fears the social stigma of

adolescent pregnancy and STDs may engage in more vigilant decision making. A female with this mindset may view such consequences of unprotected sex as a potential loss. These losses can encompass missed education and unachieved future career goals (Chambers & Rew, 2003). Adolescents worried about self-image in this way, may have a higher level of decision esteem. According to the Conflict Theory of Decision Making, decision esteem is associated with more vigilant decision-making (Chambers & Rew, 2003). Adolescents with future concerns may be more likely to undergo a more rigorous decision making process in which he/she will take future risks into account before deciding on an action.

Another theory to explain and understand the decision to use a condom among the adolescent population is the Transtheoretical Model (TTM). Originally developed by Prochaska and DiClemente to understand smoking cessation, TTM has been applied to an array of health problems. TTM focuses on an individual's readiness to change through six steps: pre-contemplation, contemplation, preparation, action, maintenance, and termination. (Noar, Morokoff, & Redding, 2001). The stages focus on the time frame for which the individual is willing to change. An individual in the pre-contemplation stage is not willing to change within the next six months. When in the contemplation stage, the individual has intention to change in the next 6 months. Preparation means that the individual intends to change within the next 30 days, whereas action shows that the individual has made a specific change to his/her behavior within the last six months. Maintenance is defined by the individual's attempt to prevent relapse. Once the individual reaches the final stage of termination, he or she is no longer at a risk for relapse. In this stage, temptation is no longer an issue as it was in the maintenance stage. Upon reaching termination, the individual is confident in his/her ability to maintain a healthy lifestyle (Noar et al., 2001; Prochaska, 2008).

Self-efficacy is also an important construct of the Transtheoretical Model, especially when used to study condom use in adolescents. Self-efficacy relates to an individual's perceived ability to carry out a behavior, in this case, properly using a condom. Studies have indicated that those with higher self-efficacy are more persistent when attempting to achieve their desired outcome (French & Holland, 2013;(Noar et al., 2001)). Having high self-efficacy for condom use is important for female adolescents to be able to negotiate condom use with partners. Research shows that women are more likely to negotiate condom use than males. Varying research has shown that higher self-efficacy in condom use is associated with higher rates of condom use. French and Holland's study reported that those with higher condom use self-efficacy were more likely to directly request their partner to use a condom, whereas those with lower self-efficacy for condom use were less likely to require their partner to use a condom (2013).

Condom Negotiation

As stated above, a sense of self-efficacy leads to a greater ability to successfully negotiate condom use. The who possess the ability to reject (Self-efficacy) sex without a condom are more confident in their ability to negotiate condom use and to negotiate with partners who are unwilling to use a condom (French & Holland, 2013). While self-efficacy is an internal belief, condom negotiation is an actual behavioral skill and is considered one of the best predictors of condom use. Condom negotiation can be accomplished in a variety of strategies- direct, indirect, verbal, and non-verbal (French & Holland, 2013). Negotiation can include withholding sex or directly requesting a partner to use a condom, both of which have proven effective in increasing condom use. Communication is an important part of condom negotiation (French & Holland, 2013).

Condom negotiation is a particularly important skill for females. Males and females tend to have different beliefs regarding advantages of condoms (Calsyn et al., 2013). Female adolescents have reported lower condom use because they expect their partners to have negative attitudes towards condoms (Staras et al., 2013). Men are more likely to portray condoms negatively (Calsyn et al., 2013). Males often state that condoms reduce their sexual pleasure, do not fit properly, and interrupt the mood (Calsyn et al., 2013; De Visser, 2004). Unfortunately, many males and females still consider that it is the male's role to decide whether to use a condom. This attitude affirms older cultural beliefs that females should be passive in sexual matters (French & Holland, 2013).

Adolescents attending schools with condom availability programs are more likely to use condoms than students who attend schools without condom availability. Unfortunately research shows that female adolescents are generally unaffected by condom availability programs. Females may be less likely to request a condom from school and may be more timid about requiring a partner to wear a condom (Wretzel, Visintainer, & Pinkston Koenigs, 2011).

When parents communicate openly with their children about sexual issues, these children are more likely to delay sexual initiation, have fewer partners, and practice safer sex (O'Sullivan, Meyer-Bahlburg, & Watkins, 2001). sexual matters (Afifi, Joseph, & Aldeis, 2008). Adolescents may benefit if parents brought up the matter first to encourage open discussion.

Commented [A36]: ?

Interestingly, many parents discuss the risks of sexual behavior such as HIV, STDs, and pregnancy, yet only one quarter of parents advise their children on where contraceptives can be obtained to prevent against said risks (Afifi, Joseph, & Aldeis, 2008). Research is often inconsistent as there is no standard to measure communication between children and their parents (O'Sullivan, Meyer-Bahlburg, & Watkins, 2007).

Commented [A37]: Didn't you already talk about this?

Okay, so at the end of the day, you have:

1. From Results: Demographic and social factors on contraceptive use, as described in the research literature

2. From Discussion: All kinds of theories about how to get people to do things

How to you propose applying these two things to get kids to do dual use? How would you use what you learned from #1 to your advantage? (hint: you know WHO to target at least, and also maybe HOW). This section should be full of sentences like, "Because findings from this review indicate that X, theory Y may be helpful in addressing [phenomenon Z]"…things like that. Be specific in applying results, not just standalone generalities like, "It's important to know how kids act so they can stop getting all those STD's they get".

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Revision Tracking Sheet & Self-Assessment (REQUIRED with every submission)

Name: Submission date: 1026/14 For return by: 11/11/14

X I affirm that all changes from the previous draft have been HIGHLIGHTED

Revision Tracking Sheet		
Date	Version	Overview of changes from last version
10/26/14	Version 2	• Updated corrections from recommendations • Added table based on findings • Added findings for first two "buckets"
9/16/14	Version 1	• Reorganized to fit required format • Removed information that is no longer relevant • Set up structure for findings.

Notes to reviewer concerning THIS submission:

- Dr. Chu, I've updated the corrections. I also moved a lot of things around for a better flow.
- I still have to add my findings for the final two buckets and work on my discussion and summary/recommendations.
- Is my intro hitting the inverted triangle mark? I'm afraid that I'm going from really wide to really narrow too quickly.
- I added the table based on your suggestions. Do I have to summarize each of my articles in the table? For example, give the author and which portion of the findings the study is related to? Or is the table okay as it is?

SELF-ASSESSMENT OF CURRENT DRAFT	
Writing issues	Self-Assessment: Unless marked OPTIONAL, you must provide text for EACH element
• Excessive spelling, punctuation, grammar, incomplete sentences, or writing issues.	Reviewed. Will be doing a more intensive proofread for next submission.
• References in APA format (both in text and in references section). Headings in APA format.	Yes.
• Formatting (double-spaced, 1" margins, page numbers, 12 point font, 0.5" paragraph indents).	Yes.
• Every paragraph must have a thesis statement; each statement in that paragraph should support that thesis statement.	I think this is better than previous submission.
• OTHER [OPTIONAL]	
Content	
Abstract (0.5-1 pg.) • 5 elements (Background, Problem/Thesis, Methodology, Findings/Results,	Will create abstract once research is complete.

Implications). Includes main thesis/argument/claim.	
Introduction (2-5 pgs.) • • □Inverted triangle • • □Properly cited definition • • □Statistical overview with relevant, detailed and correctly interpreted data	Added definition.
Methodology (1/2-1pg.) • Sources, types • Limitations; • • □Inclusion/exclusion criteria • • □Total N	Done.
Findings or Results (10-15 pages) • • □Transition statement • • □Organized and labeled subheadings that have been explicitly referred to at beginning of section • • □Fully populated table of your findings, with a proper title that accurately describes content and indicates total number of studies/articles represented, and properly labeled columns	Table added
Discussion (3-15 pgs.) • • □Short review of lit review findings • • □Analysis of strengths and weaknesses of issues raised • • □Critical examination of the issues raised in the literature	N/A
Summary and Recommendations (2-3 pgs.) • Concrete and well-informed recommendations that logically connect with results	N/A
References (3-20 pgs.) • Reputable sources only; all sources listed in paper are in references and vice versa; 3-20 pgs.	Yes
OTHER [OPTIONAL]	
Intellectual Rigor	
• Comprehensive: Is the literature review comprehensive and appropriate for the topic of the paper, with an accurate description and assessment of all relevant research?	Sources are appropriate, but might not be comprehensive as of yet.
• Synthesized: Is the literature adequately synthesized (i.e., appropriate level	Yes.

of meta- analysis applied, rather than reading like a "book report")?	
• Well-reasoned: Is the reasoning, explanations of opinions, conclusions and conceptualizations presented sound and well-supported by the evidence presented, or the opinions of authorities cited?	Yes. Will add more for discussion and summary
• Knowledgeable: Does paper demonstrate adequate knowledge about the basic scientific theories, as well as the institutions, policies, and regulations, encompassed by the health topic?	Yes.
• OTHER [OPTIONAL]	

Racial Disparities in the Prevalence of Obstructive Sleep Apnea and its Relationship with Cardiovascular Disease Outcomes

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"Racial Disparities in Obstructive Sleep Apnea risk and Cardiovascular Disease Severity: Research Proposal to National Institutes of Health (R03 Mechanism)"

Abstract

Obstructive sleep apnea (OSA) is an important public health issue. OSA is a common but often undiagnosed disorder, which, if left untreated can increase the risk of hypertension, stroke, and other cardiovascular disease (CVD). Untreated OSA also causes a huge burden on the economic and health care system due to increased health care utilization and associated comorbidities. OSA is characterized by disrupted sleep, disordered breathing and excessive daytime sleepiness which is associated with workplace injuries and reduced work performance. The issues associated with diagnosis, treatment and lack of adherence to OSA treatment remain a public health challenge. Existing literature indicates that the incidence and prevalence of obstructive sleep apnea are higher among blacks than whites, and blacks are less likely to adhere to recommended treatment compared with other racial/ethnic groups. Blacks also have higher rates of mortality due to cardiovascular disease and are disproportionately affected by severe sleep apnea than whites. Improved awareness and knowledge about OSA symptoms among high risk populations, such as blacks, timely identification of OSA symptoms and diagnosis, effective OSA treatment methods and interventions aimed at improving adherence to those methods can not only help to reduce the mortality and morbidity due to OSA but also result in reduced morbidity due to cardiovascular disease among high risk populations. A better understanding of

the role of confounding factors and barriers to treatment for OSA could improve the implementation of treatment strategies and also reduce the social impact of obstructive sleep apnea.

Racial Disparities in the Prevalence of Obstructive Sleep Apnea and its Relationship with Cardiovascular Disease Outcomes

Obstructive sleep apnea is a chronic disorder which is characterized by one or more pauses in breathing while sleeping and causes disordered sleep (Gupta & Knapp, 2014). Each pause in breathing is called apnea and can last from a few seconds to a few minutes. These pauses in breathing leads to a poor quality sleep and thus excessive daytime sleepiness and tiredness (National Heart, Lung and Blood Institute, 2012). Sleep disordered breathing and associated symptoms such as sleep apnea not only affects the quality of life, but also increases the risk for various health conditions. Sleep apnea is of three types; Obstructive Sleep Apnea (OSA), Central Sleep Apnea (CSA) and complex or mixed sleep apnea, which is a combination of obstructive and central sleep apnea (Morgenthaler, Kagramanov, Hanak & Decker, 2006). OSA is associated with increased risk for stroke and heart disease and excessive daytime sleepiness and is also linked to car and workplace accidents (Gupta & Knapp, 2014).

Obstructive sleep apnea is one of the most common sleep disorders that affects 2 - 4% of the adult population (Miljuš, Tihaček-Šojić, Milić-Lemić, & Andjelković, 2014). In OSA, the airway collapses or becomes blocked during sleep and thus, loud snoring is heard due to shallow breathing. In CSA, the breathing is paused for brief periods because the brain is unable to send

correct signals to breathing muscles (National Heart, Lung and Blood Institute, 2012). Snoring is usually not observed in CSA. Although, the effects of CSA on the body are similar to OSA such as shortness of breath, drop in blood oxygen level and increased blood pressure, CSA is less common and often occurs in people who have had a heart failure (Leung & Bradly, 2001).

OSA has been linked as an independent risk factor for hypertension, stroke, and abnormal glucose metabolism and may contribute to cardiovascular morbidity (Gupta & Knapp, 2014). If left untreated, sleep apnea can also increase the risk for diabetes and obesity. Existing literature indicates that racial differences in sleep related problems such as insufficient sleep, sleep apnea, and disordered sleep might be related to the differences in outcomes of cardiovascular disease, hypertension and stroke (Kingsbury, Buxton, Emmons, & Redline, 2013).

OSA often goes undiagnosed because patients are often unaware of the symptoms and it cannot be detected through regular doctor visits. The person experiences excessive daytime sleepiness, morning headaches and fatigue or the symptoms are observed by the bed partner of the patient, such as loud snoring, snorting, gasping or episodes of apneas. The most commonly used treatment for sleep apnea is continuous positive airway pressure (CPAP) which includes a device that consists of a mask worn on the face which is connected with a plastic tube to a flow generator.

CPAP ensures a continuous flow of air during sleep and thus improves the sleep quality. Sleep apnea is strongly associated with increased blood pressure and risk of stroke. The relationship between obstructive sleep apnea and cardiovascular disease is synergistic and is highly correlated. A high prevalence of OSA was found among patients with coronary heart disease, arrhythmia and myocardial infarction (Shahar, Whitney & Redline, 2001). Some of the strongest risk factors for OSA are obesity and age older than 65 years (Collazo, 2014). Obesity

could increase the likelihood of airway collapse by directly affecting the upper airway tract, as fat is deposited in the surrounding structures. Being male is also one of the risk factors of OSA. Since men gain more weight centrally than women, the deposited fat pressurizes the upper airway tract, thus causing difficulty in breathing while sleeping. Males also have a higher prevalence of OSA and require higher continuous positive airway pressure (CPAP) for the treatment (Jordan, McSharry, & Malhotra, 2014).

Age is also another major risk factor for sleep apnea. The efficiency of the upper airway muscles decreases with age and thus older population may experience more apnea episodes and disordered sleep. Women of all ages have less severe apnea than men. There are racial/ethnic differences in prevalence of sleep apnea, but socioeconomic factors, living in disadvantaged neighborhoods, obesity and other existing health conditions may contribute to variations in sleep apnea prevalence (Ralls & Grigg-Damberger, 2012). A strong racial disparity exists in the prevalence and treatment of hypertension and its relationship to obstructive sleep apnea. African-Americans have shown to have severe sleep disordered breathing with a relative risk twofold as great as that for Caucasians independent of age, sex, and body mass index (Ancoli-Israel, 1995). Latino/ Hispanics also showed a higher prevalence of cardiovascular disease and increased risk of sleep disordered breathing as compared to Caucasians (Redline et al, 2014).

The purpose of this paper is to study the prevalence of obstructive sleep apnea, existing disparities in the prevalence of OSA among various racial groups, study the relevance of OSA in people who already have cardiovascular disease or are at risk of having cardiovascular disease and to understand the interactions between OSA, race, cardiovascular disease and other confounding variables such as socioeconomic status, age, obesity and education. There are several considerations in addressing the issues related to OSA and cardiovascular disease. The

complexity of the relationship between sleep apnea and comorbidities such as obesity and other metabolic disorders poses a serious challenge in addressing the problem. Obesity has shown to have a close synergistic relationship with sleep apnea. Other confounding factors that affect the prevalence of sleep apnea are diabetes and cardiovascular disease which are often present in patients with OSA and conversely, OSA has shown to exacerbate obesity and diabetes. Racial differences in prevalence rates and mortality rates due to CVD in patients with sleep apnea have also been reported in various studies. Patients with OSA place a significant burden on the healthcare system, especially because it often goes undiagnosed and has many associated health implications that increases morbidity. This paper is focused on presenting evidence from the literature to understand the possible interactions between obstructive sleep apnea, cardiovascular disease and race along with the role of confounding factors such as socioeconomic factors, diet & lifestyle factors and how identifying these risk factors could potentially reduce morbidity due to cardiovascular disease.

Review of Literature

Economic burden of OSA

The health care burden of morbidity due to sleep apnea and related health conditions is huge. It is estimated that sleep apnea is responsible for over 38,000 cardiovascular deaths yearly, with an associated 42 million dollar health care expenditure related to hospitalizations (William et al, 2014). Race, low socioeconomic status, low education, cost of OSA treatment and cost of sleep apnea comorbidity affects the healthcare costs. It was reported that the costs of untreated obstructive sleep apnea may double the medical and healthcare expenses primarily because of associated risks of CVD (Tarasiuk & Reuveni, 2013). OSA contributes to health care costs not only due to direct costs associated with management and treatment of OSA and the associated

medical conditions but also due to indirect expenses from low productivity at work linked with excessive daytime sleepiness which is one of the main symptoms of OSA, motor vehicle accidents, work place injuries and costs from poor life quality due to morbidity. A study by Sassani et al. indicated that vehicle collisions and fatalities in collisions due to sleep apnea alone contributed to 810,000 collisions and 1400 fatalities with an estimated 15.9 billion dollars of expenditure (Sassani et al., 2004).

Race and OSA

Racial disparities in various health issues and disease outcomes have been a challenge to public health. Health disparities exist among various ethnic/racial groups and disproportionately affects certain groups than another. African-Americans and other ethnic/racial minority groups are more likely to have unhealthy sleeping pattern that may contribute to disparities in health outcomes. Sleep apnea occurs more frequently among African-Americans and Asians than Caucasians and has been significantly associated with hypertension, obesity and diabetes mellitus (Leung & Bradly, 2001). Lauderdale et al. found that African-Americans have lower mean sleep duration, lower sleep efficiency, and higher sleep latency as compared to their white counterparts, even after controlling for various socioeconomic and demographic factors (Lauderdale et al, 2006).

Black people younger than 25 years and older than 65 years have a higher prevalence of OSA than people from other racial groups (Olafiranye, Akinboboye, Mitchell, Ogedegbe, & Jean-Louis, 2013). A study done by the Chicago section of the Coronary Artery Risk Development in Young Adults project reported that Black men slept 82 minutes less per night on average as compared to the group with the best overall sleep characteristics (White women)

even after controlling for social status, various comorbidities, body mass index, and sleep-disordered breathing (Bryson & Edwards,2013).

A population-based survey conducted by Kripke et al. estimated that 16.3% of the US Hispanics and racial minorities have Obstructive Sleep Apnea Syndrome (OSAS) or OSA as compared with 4.9% of non-Hispanic whites aged 40 to 64 years. The findings from the study revealed that the subgroup of non-Hispanic, non- black minorities, who were mostly Asians, might have a higher prevalence of OSA as compared with Hispanics and blacks (Kripke et al, 1997). Another study has also suggested that Asians with OSA have a greater severity of illness compared with whites. Craniofacial anatomy is a well-known risk factor for the development of OSA and the variations in craniofacial anatomy are attributed to race. A prospective study was done among Far-East Asian men (Chinese, Japanese and Korean) and white men to study the difference in OSA prevalence. The study suggested that despite low BMI and after controlling for age, the Far-East Asian men had severe OSA syndrome than whites. Therefore, obesity or high BMI may be a less important risk factor for OSA in Asians as opposed to other racial/ethnic groups such as African-Americans where BMI is a significant indicator of OSA risk (Leung & Bradly, 2001).

A study by Friedman et al. was done to study the relative incidence of obstructive sleep apnea-hypopnea syndrome (OSAHS) in the African-Americans as compared to Caucasian-Americans. It was found that OSAHS and loud snoring was more common in African Americans than Caucasian Americans. Since loud snoring is one of the signs of sleep apnea that could help to diagnose sleep apnea timely, it was reported that African Americans accepted snoring as normal and that might have contributed to late detection of sleep apnea among this racial group (Friedman et al, 2006).

Existing literature also indicates that racial differences in sleep related problems such as insufficient sleep, sleep apnea, and disordered sleep might be related to the racial differences in outcomes of cardiovascular disease, hypertension and stroke (Kingsbury, Buxton, Emmons, & Redline, 2013).

Cardiovascular disease and OSA

Sleep-related breathing disorders are highly prevalent in people with a history of cardiovascular disease (Shamsuzzaman, Gersh & Somers, 2003). Of all the sleep-related disorders, Obstructive sleep apnea (OSA) is most common and affects approximately 15 million adult Americans, the majority of them having an established history of hypertension, stroke and atrial fibrillation. OSA affects approximately 50% of the patients with cardiovascular disease. Several studies have indicated that patients with stroke have a higher incidence of obstructive sleep apnea as compared to people without stroke independent of sex and age (Dyken, Somers, Yamada, Ren & Zimmerman, 1996). For several years, the link between cardiovascular disease and sleep apnea was thought to be a result of various factors such as age, sex and BMI (Body Mass Index). Until recently, various epidemiological studies showed sleep-related breathing disorders to be an independent risk factor for hypertension and cardiac arrhythmia. A causal role of OSA in the development of cardiovascular disease is supported by the evidence that any form of sleep apnea contributes to increased blood pressure, intermittent hypoxia, or oxygen deprivation and sleep fragmentation (Kendzerska, Gershon, Hawker, Leung & Tomlinson, 2014).

Several studies have shown a disproportionately high prevalence of hypertension and more severe sleep apnea in African-Americans than Caucasians, associating OSA to be a major risk factor in causing possible differences in morbidity and mortality due to hypertension (Sands,

Botros, Lichtman, & Yaggi, 2008). Despite recent decline, cardiovascular disease still remains the leading cause of death in African-American and Caucasians in the United States. The decline is less accountable for African-Americans because of a disproportionately high burden of mortality due to heart disease and low life expectancy rates (Roger et al., 2012). A population-based study was carried out to study sleep apnea as a risk factor for hypertension and it was found that the difference in blood pressure while sleeping varied significantly from the blood pressure during other times of the day among people with obstructive sleep apnea (Young et al, 1997).

The prevalence rate of hypertension among African-Americans is twice that in Caucasians (Go et al, 2013). Several studies have documented a high prevalence of OSA in patients with heart failure. Conversely, a causal role of OSA in the progression of heart failure is also suggested and the treatment of OSA significantly improved the cardiac function in patients with OSA (Gottlieb et al, 2010). The findings were consistent with another study that showed that a greater prevalence of severe sleep apnea among African-Americans and similarly high levels of blood pressure was also observed and treating sleep apnea reduced the incidence of hypertension (Sands, Botros, Lichtman, & Yaggi, 2008).

CPAP therapy for OSA

The increased risk of hypertension associated with untreated sleep apnea was linked to long-term incidence of stroke and coronary heart disease and the use of CPAP may reduce the risk of hypertension and stroke (Campos-Rodriguez et al, 2014). Despite the evidence that continuous positive airway pressure (CPAP) is an effective method for treatment of OSA and can help to improve the quality of life, compliance with the use of CPAP therapy among certain racial groups, especially blacks, is low. CPAP treatment allows a continuous flow of air through

the airway passage which helps to control blood pressure spikes. CPAP method includes a device that consists of a mask worn on the face by the patient and the mask is connected to a plastic tube to a flow generator that ensures a continuous flow of air for proper breathing during sleep. Although a direct association between CPAP and reduced risk of stroke has not been established, regular use of CPAP to treat sleep apnea have shown to reduce daytime and nighttime hypertension thereby indirectly reducing the risk of stroke.

Becker et al concluded in their study that the use of CPAP showed a significant improvement in arterial blood pressure. After 9 weeks of CPAP treatment, there was a drop of 10 mm Hg in mean blood pressure, which could potentially reduce the risk of coronary heart disease by 37% and stroke risk by 56% (Becker et al, 2003). Also, CPAP helps to provide stable sleep and thus reduces the risk of daytime sleepiness and fatigue, which in turn has shown to reduce the risk of cardio metabolic disorders such as obesity and diabetes. People experience improved energy levels after the use of CPAP, are physically active and have improved productivity at work as compared to people with untreated sleep apnea who battle with excessive fatigue, headache and sleepiness (Montserrat, 2001).

Workplace accidents and OSA

Sleep-disordered breathing poses health risks, risks of occupational accidents and low work performance. People who have sleep apnea have a three- to seven fold increased risk of motor vehicle accidents (Tarasiuk & Reuveni, 2013). A study was done to compare the rates of occupational injuries among patients suffering from sleep-disordered breathing with an employed, age-matched random sample of the general population. It was found that the risk of being involved in occupational accidents was twofold for males and threefold for females as compared to the general population (Ulfberg, Carter & Edling, 2000). Similar findings were

reported in another study that showed that drivers who had large neck size, which is used to measure total score in the sleep apnea questionnaire and had a history of sleep apnea or disordered sleep were at greater risks of car accidents due to troubled sleep and daytime sleepiness (Amra et.al, 2012).

OSA and confounding factors

The association between disadvantaged neighborhood, residential environment and poor health outcomes is well established. Several biological and psychosocial factors such as age, socioeconomic status, diet and mental health could potentially be mediating the differences in prevalence of hypertension among various racial groups and the difference in health outcomes among various racial groups.

The sleep duration is affected by socioeconomic factors, segregation, neighborhood environment and lifestyle differences (Hale & Phuong Do, 2007). These confounding factors may result in inadequate sleep due to the presence of psychosocial stressors among racial minority groups and residents of urban environments. Low income and low educational level of people from ethnic/ racial minority groups could probably be contributing to the stress due to night work shifts and working more than one job and thus reduced sleep duration. Racial, economic and social segregation affects the health of the residents and disproportionately exposes them to health risks. Residence in an inner city was associated with increased risk of disordered sleeping as compared to non-urban areas. Among the four racial/ethnic groups, White, Black, Mexican American, other Hispanics and other Non-Hispanics, blacks and other Hispanics showed a high prevalence of living in the inner city which was linked to the increased risks of sleep related disorders and thus poor health outcomes (Hale & Phuong Do, 2007). Apart from demographic, socioeconomic and environment factors that contribute to poor health

outcomes, existing health conditions among different racial groups and disparities in access and utilization of health care plays a significant role in the prevalence of OSA.

Barriers to OSA identification and treatment

Low education and awareness levels about obstructive sleep apnea among people, especially among blacks, was considered to be one of the major factors that results in under diagnosis, late diagnosis and lack of timely treatment for OSA (Rosen, Zozula, Jahn & Carsond, 2001). Apart from lack of awareness about the symptoms of OSA and about treatments available for OSA, low compliance with the OSA treatment methods among the patients was another barrier contributes to the increased prevalence of OSA. Several studies have reported a significant role of beliefs and knowledge on understanding and reporting of sleep-related disorders among the blacks. It was found that misconceptions about sleep apnea and lack of knowledge about sleep apnea symptoms were significantly related to poor diagnosis and treatment of sleep apnea (Rosen, Zozula, Jahn & Carsond, 2001).

A study conducted by Friedman et al., showed that 33% of the black participants considered snoring to be normal as compared with 20% of the white participants. Bed partners of the participants of black race/ethnicity were also more likely to accept loud snoring as normal. Overall awareness about possible risk factors or signs of sleep apnea was lower among participants from the black racial group (Friedman et al, 2006). Moreover, lower acceptance rates for the CPAP treatment of sleep apnea was demonstrated due to the inconvenience and misconceptions about the device. Participants were more likely to refuse the treatment for sleep apnea due to insufficient knowledge about the CPAP machine, discomfort in wearing the mask while sleeping and concerns about their partners' acceptance of the mask while sleeping with them. Thus, low rates of adherence to the treatment were shown to be a contributing factor to the

high prevalence and morbidity due to sleep apnea (Shaw et al., 2012). The use of this therapy has shown a significant improvement in sleep and breathing during sleep, thus reducing daytime sleepiness. CPAP has also shown to reduce the risks of stroke and hypertension among the patients (Salepci et al., 2013). Sleep apnea treatment requires long-term management and adherence. The challenges faced in administering CPAP include the cost-effectiveness, time availability because the patient has to spend the night at the sleep clinic for the treatment and most importantly adherence to CPAP treatment.

Despite of clinical and medical advancements, existing data suggest that 82% of men and 93% of women with sleep apnea in the United States remain undiagnosed (William et al, 2014). The inability to diagnose OSA timely and high rates of undiagnosed cases are attributed to the inability of people to identify their symptoms and report disordered sleep to the doctor. The symptoms are often identified by the family members or bed partners of the patients, but are misdiagnosed as insomnia or regular snoring. Thus, patient awareness and knowledge of symptoms plays a crucial role in reducing the morbidity due to OSA through timely treatment. Since morbidity and mortality due to OSA are largely due to late detection, it calls for interventions targeted towards increasing awareness about signs and symptoms of sleep apnea to help in the timely and accurate identification of sleep-related disorders. Such interventions will not only ensure a timely treatment of sleep apnea, but will also help in detecting risks for comorbidities such as hypertension, stroke and cardiovascular disease. Race, socioeconomic factors, education, neighborhood environments, obesity and age have shown to be the major risk factors for sleep apnea prevalence and controlling for one may potentially control the risk of sleep apnea. Polysomnography is one of the best methods to test for OSA but it is expensive, cumbersome and time-consuming (Jordan, McSharry & Malhotra, 2014). There is a need for

more efficient and cost effective diagnosis and management techniques for sleep apnea. Home diagnosis has been hypothesized to be helpful in managing sleep apnea, but lack of evidence suggests that it is being investigated or no conclusive studies have been reported. On the other hand, CPAP is a cost-effective treatment, but requires long-term adherence. People should be made aware about the CPAP treatment therapy and be given information about the treatment to make them more receptive and overcome any misconceptions associated with using the device and adhering to the treatment. Therefore, it is imperative to focus more research studies on identifying risks of sleep related disorders such as sleep apnea among certain racial groups, which may help in developing interventions to reduce the risk factors of sleep apnea and thus potentially reduce cardiovascular disease risk and morbidity among high risk racial groups.

Gaps and Issues in the Literature

Obstructive sleep apnea (OSA) is a common disorder that affects people of all ages, but is more prevalent among older adults (Miljuš, Tihaček-Šojić, Milić-Lemić, & Andjelković, 2014). Poor sleep quality, excessive daytime sleepiness and fatigue are the most common symptoms of sleep apnea, although many patients may be asymptomatic. Although a vast majority of studies has shown that OSA and cardiovascular disease are intertwined, little is known about the exact mechanics of the relationship. The data on long term treatment of sleep apnea and its outcome is also scarce and does not provide conclusive evidence. The studies done on racial differences in sleep apnea prevalence have provided data mainly among two racial groups; Blacks and Caucasians. Very limited data were available on sleep apnea risks among other racial groups. It is important to understand the existing gaps in sleep apnea research and how addressing those gaps can improve sleep apnea identification and treatment and the quality of life by reducing the

risk of comorbidities associated with sleep apnea. Below are some of the gaps in research that needs to be studied and provide conclusive evidence for OSA prevalence and treatments.

Sleep apnea and Race

The majority of the available data on sleep apnea and racial disparities has shown a difference in the prevalence of sleep apnea among blacks and Caucasians. A strong racial disparity exists in the prevalence and treatment of hypertension and its relationship to sleep apnea. African-Americans are two times more likely to have severe sleep disordered breathing than Caucasians (Ancoli-Israel, 1995). Latino/Hispanics also showed a higher prevalence of cardiovascular disease and increased risk of sleep disordered breathing as compared to Caucasians (Redline et al, 2014). Although studies suggest a strong link between race and sleep apnea, very limited research has been done in other racial/ethnic groups to study the prevalence and severity of sleep apnea. Since socioeconomic status, neighborhood environment, education level and lifestyle factors play a confounding role in the health and health-related outcomes of minority groups, research on other racial and minority groups would help to study the underlying factors that brings about differences in sleep apnea prevalence and have a comparative evidence to study if there is a direct link between race and sleep apnea.

Patient adherence to treatments

The most commonly used treatment for moderate to severe sleep apnea is continuous positive airway pressure (CPAP). Other treatment options include surgical correction of upper airway and mouth pieces (also known as oral appliances). The commonly used methods for diagnosing and treating OSA are cumbersome, resource intensive, and often inconvenient for the patient. Low acceptance rates for the CPAP treatment of sleep apnea has been reported as a

major factor in the undiagnosed and untreated cases of sleep apnea. The low acceptance of CPAP method is due to the inconvenience, discomfort and misconceptions associated with the device. Studies have shown that patients are more likely to refuse the treatment for sleep apnea due to insufficient knowledge about the CPAP machine, discomfort in wearing the mask while sleeping, excessive salivation, nasal and oral dryness and concerns about their partners' acceptance of the mask while sleeping with them (Eisenberg, 2007). Thus, low rates of adherence to the treatment were shown to be a contributing factor to the high prevalence and morbidity due to sleep apnea (Shaw et al., 2012). The limited evidence of comparative research between CPAP and other available options for effective treatment and management of sleep apnea indicates an existing gap in research. Compliance remains a barrier to CPAP treatment, but there is insufficient evidence to evaluate compliance with other treatment options.

Long term clinical outcomes

Treatment of sleep apnea requires long term management and adherence to the treatment methods along with lifestyle changes such as weight reduction. The existing literature provides inadequate data on the long-term clinical outcomes of using CPAP and other methods for treatment of sleep apnea and how it helps to reduce morbidities related to heart disease, hypertension and metabolic disorders such as diabetes and obesity. The studies done in the past have focused on intermediate measures based on sleep testing scores, Apnea-Hypopnea Index (AHI) and not on the evaluation of long term clinical outcomes. Research focused on studying the impact of long-term clinical outcomes of treatment methods would help to determine the effectiveness of treatments and how those treatments can eventually help in reducing mortality and morbidity due to cardiovascular disease (including stroke, coronary artery disease, congestive heart failure, and atrial fibrillation), and diabetes.

Cost-effectiveness

Studies about cost-effectiveness of different treatment methods and management strategies for sleep apnea are very limited. Most data is available on CPAP method and how it is used more often than other methods, but not how cost-effective CPAP is when compared to other available treatments. The cost of treatment plays an important role in patient's adherence to sleep apnea therapy and effective outcomes. A comparative cost analysis, among different methods based on the scale of cost per treatment, utilization, benefits, clinical outcomes, and effectiveness of the methods would help to distinguish between the cost-effectiveness of the treatments and thus help in planning and targeting interventions towards low-income and minority groups and in the community in general.

Interventions that can improve compliance with CPAP, oral device, and other treatments

It is important to find ways to improve compliance with sleep apnea treatment. Lack of awareness about the available treatment methods, knowledge of CPAP device and misconceptions were reported to be responsible for low compliance. There is little evidence that suggests that the measures to address low compliance with CPAP treatment and other treatment options are undertaken or if there are any specific adjunct interventions which may improve CPAP compliance. Interventions aimed at providing intensive patient education, training, creating awareness in the community, support groups and behavioral therapy can help to improve compliance (Patel et al, 2013).

Discussion

Sleep apnea is a serious condition that greatly affects the quality of life and if left untreated, can result in mortality and morbidity due to associated cardiovascular risks. It is important to study

why certain racial groups are more affected than other groups and why communities are burdened disproportionately from sleep apnea. It is crucial to study what role does race/ethnicity of an individual play in predisposing people to sleep apnea. Although sociodemographic, environmental, economic, educational and cultural factors contribute to the prevalence of this disease, it would be helpful to study how race alone is a significant factor in the sleep apnea prevalence and morbidity.

The availability of various treatment options for sleep apnea, yet low treatment rates among points towards gaps in the health care system and low awareness levels among the community members. An increased awareness about screening methods, home-testing, identifying risk factors such as excessive snoring and improving adherence to treatment can result in better health outcomes for people with sleep apnea.

Effective behavioral interventions are needed to increase the number of high-risk population receiving adequate OSA assessment and treatment. There is a need for interventions aimed at improving behaviors of the people that includes reducing behaviors that predisposes them to be at risk of sleep apnea and encouraging healthy behaviors that helps them identify symptoms and risks of sleep apnea timely, thus reducing morbidity due to sleep apnea through early detection and alternatively reduce cardiovascular morbidity. Risk-reducing behaviors could include healthy diet and lifestyle changes to reduce obesity, diabetes mellitus and hypertension that are directly associated with sleep apnea.

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APPENDIX A

Racial Disparities in Obstructive Sleep Apnea (OSA) and Cardiovascular Disease Severity:

Research Proposal to National Institutes of Health (R03 Mechanism)

Racial Disparities in Obstructive Sleep Apnea (OSA) and Cardiovascular Disease Severity: Research Proposal to National Institutes of Health (R03 Mechanism)

ABSTRACT

The purpose of this R03 proposal is to understand the correlation between Obstructive Sleep Apnea (OSA) risk and cardiovascular disease (CVD) severity among various racial/ethnic groups in New York City. This study will also help to identify the relationship between race, education level and other sociodemograpic factors and the risk of OSA among the sample.

OSA is a common but often undiagnosed disorder, which, if left untreated can increase the risk of hypertension, stroke, and other cardiovascular disease (CVD). An estimated 15 million adult Americans are affected by OSA and is largely present in patients with hypertension and other cardiovascular disease. Untreated OSA also causes a huge burden on the economic and health care system due to increased health care utilization and associated comorbidities. OSA also increases the risk of workplace and car accidents due to excessive daytime sleepiness, fatigue and headaches.

Studies have shown that racial differences in sleep related problems such as insufficient sleep, sleep apnea, and disordered sleep might be related to the differences in outcomes of cardiovascular disease, hypertension and stroke. African-Americans and other ethnic/racial minority groups are more likely to have unhealthy sleeping pattern that may contribute to disparities in health outcomes. Existing literature also suggests that sleep apnea occurs more frequently among African-Americans than Caucasians and has been significantly associated with hypertension, obesity and diabetes mellitus. Although, the majority of literature suggests that racial/ethnic minority groups are more severely affected by OSA, very limited data are presented for racial groups such as Asians and Hispanics. The proposed research will focus on studying low-risk and high-risk groups for OSA, identify the rate of OSA in various racial/ethnic groups which have not been studied, and analyze its correlation to CVD severity.

I. SPECIFIC AIMS

Obstructive Sleep Apnea (OSA) is one of the most common sleep disorder affecting 2-4% of the adult population in the United States (Miljuš, Tihaček-Šojić, Milić-Lemić, & Andjelković, 2014). OSA is a chronic disorder which is characterized by one or more pauses in breathing while sleeping and causes disordered sleep (Qureshi, Ballard, & Nelson, 2003). OSA has been linked as an independent risk factor for hypertension (Kapa, Kuniyoshi, & Somers, 2008), stroke (Dyken, & Im, 2009), abnormal glucose metabolism (Parish, Adam, & Facchiano, 2007) and may contribute to cardiovascular morbidity (Gupta & Knapp, 2014). People with OSA have also been shown to have a three- to seven- fold increased risk of motor vehicle accidents (Tarasiuk & Reuveni, 2013). The health care burden of morbidity due to sleep apnea and related health conditions is huge. It is estimated that OSA is responsible for over 38,000 cardiovascular deaths yearly (Öğretmenoğlu et al., 2005), with an associated 42 million dollar health care expenditure related to hospitalizations (William et al., 2014). Over 40% of patients with mild OSA and 69% of patients with severe OSA have shown to have hypertension (Young et al., 2008). OSA treatment has shown to reduce the risk of cardiovascular disease (CVD) by 64% (Buchner, Sanner, Borgel, & Rump, 2007) that suggests a correlation between OSA risk and CVD.

Existing literature indicates that racial differences in sleep related problems such as insufficient sleep, sleep apnea, and disordered sleep might be related to the differences in outcomes of cardiovascular disease, hypertension and stroke (Kingsbury, Buxton, Emmons, & Redline, 2013). African-Americans have shown to have lower mean sleep duration, lower sleep efficiency, and higher sleep latency as compared to their white counterparts, even after controlling for various socioeconomic and demographic factors (Lauderdale et al., 2006). Although the majority of the data suggests that blacks are disproportionately affected by OSA, very limited data are available for other racial groups such as Asians and Hispanics that can provide any conclusive evidence about the role of race in OSA risk and CVD outcomes. Thus, this study will help to identify the rate of OSA in various racial/ethnic groups which have not been studied, and analyze its correlation to CVD severity.

In the proposed cross-sectional study, we will identify the correlation between OSA and cardiac disease severity among individuals from various racial/ethnic groups in New York City. The participants, will be aged $\geq$ 18 years, with a cardiovascular disease diagnosis, and will be selected from different primary care centers located in racially diverse neighborhoods in New York City. Each neighborhood will be selected based on the data from the US Census. A sample size of 240 participants will be recruited for the study from the following racial/ethnic groups: Whites, non-Hispanics; Black/African American, non-Hispanic; Asian, Hispanic. Surveys will be used to collect data and questionnaires such as the ARES Watermark Questionnaire and Berlin Questionnaire will be used to study sleep variables. Neck size measurement will be done using a measuring tape as large neck size is a risk factor for sleep apnea (Dixon, Schachter & O'Brien, 2003). The Epworth sleepiness scale will be used to measure the general level of daytime sleepiness which is the most common symptom of obstructive sleep apnea and questions about health, physical activity and history of heart disease will also be included in the survey about sociodemographic factors.

Aim 1: To study the correlation between OSA and cardiovascular disease severity in a sample of patients with CVD from various racial/ethnic groups living in New York City.

Aim 2: To describe the role of race, socioeconomic status and education level on OSA risk among the sample.

Impact: This study would help to determine the correlation between OSA risk and CVD severity in racial groups that are not previously well studied. It would also help to identify the role of race alone in the presence of OSA risk in CVD patients and how it adds to the burden of health disparities among various racial/ethnic groups. The findings from the study can help to postulate possible interventions and programs for the racially diverse communities and possibly reduce the risk and burden of morbidity and mortality due to CVD.

II. RESEARCH STRATEGY

1. Significance

1.1 Sleep health is one of the goals of Healthy People 2020: Sleep is an important determinant of health and well-being of an individual. The burden of sleep disorders and related comorbidities is huge. It is well established that if left untreated, sleep disorders increases the risk of heart disease, obesity, diabetes and high blood pressure. One of the goals of Healthy People 2020 concerning sleep health aims at encouraging people with excessive daytime sleepiness and other symptoms of OSA to seek medical assessment and care (U.S. Department of Health & Human Services [HHS], 2011). This study will help to identify the rate of risk of OSA among various racial groups and to contribute to the evidence base for interventions specific to different groups. The objectives of this study are consistent with the nation's goal to reduce health disparities among various racial groups and to improve population sleep health. The research is focused on studying the correlation between OSA and CVD and the findings from this study can form the basis for future interventions targeted at racial minority groups to improve identification of sleep disorders and help reduce the overall burden of heart diseases.

1.2. Rationale for focusing on people with CVD as the study population: The rationale for focusing on individuals with CVD as the target population for assessing the risk of OSA among them is twofold. Firstly, the existing literature has provided a strong synergistic link between OSA and heart diseases. Studies have shown that OSA affects approximately 50% of the patients with cardiovascular disease (Dyken, Somers, Yamada, Ren & Zimmerman, 1996). But it is not clear if OSA is a risk factor for CVD risk or presence of heart problems is a risk factor for OSA. Therefore, selecting the participants as those with established CVD history would help to determine the direction of the relationship between OSA and CVD. Secondly, certain races have shown to be at higher risk of heart disease such as blacks as compared to whites (Olafiranye, Akinboboye, Mitchell, Ogedegbe, & Jean-Louis, 2013) and other races (Leung & Bradly, 2001). Cardiovascular disease still remains the leading cause of death in African-American and Caucasians in the United States (Roger et al., 2012). Selecting participants with CVD will rule out the possibility of having an unequal number of participants representing different racial/ethnic groups and thus will help provide a better estimate of the rate of OSA risk in various racial groups.

1.3. OSA is largely under-diagnosed among Asians and Hispanics: Although race has shown to be a factor in causing disparities in sleep health, it is not certain if race alone plays a significant role in causing differences in prevalence of obstructive sleep apnea. Studies have shown a disproportionately high prevalence of hypertension and more severe sleep apnea in African-Americans than Caucasians (Sands, Botros, Lichtman, & Yaggi, 2008). Very limited data about OSA prevalence are available for Asians and Hispanics. Of the few studies done, the majority of them suggested a higher prevalence rate of OSA among Asians and Hispanics as compared to Caucasians (Redline et al., 2014), even after controlling for factors such as obesity (Leung & Bradly, 2001; Kripke et al., 1997). Selective sampling of the racial groups of interest will provide a better understanding about OSA severity for understudied populations. The symptoms of OSA are usually not identified or diagnosed correctly or in a timely manner by the patients. This increases the severity of the condition and thus poses added risks to health due to associated conditions such as heart diseases and diabetes. This research will provide data about the possible reasons for under-diagnosis of OSA in some racial groups, which can be used to design culturally and linguistically tailored programs for those groups or communities.

2. Innovation

Despite the identification of race/ethnicity as a risk factor for OSA, there is a paucity of data for various racial groups other than whites and blacks. This proposal will address this gap in the literature. This proposal is innovative for the following reasons.

2.1 Recruiting participants from multiple under-represented racial/ethnic groups: This study is one of the few that would focus on studying OSA among different racial groups, as the majority of existing data are with whites and blacks. A population-based survey estimated that, among those aged 40 to 64 years old, 16.3% of the Hispanics and racial minorities have OSA as compared with 4.9% of non-Hispanic whites (Kripke et al., 1997). Recruiting participants from multiple under-represented racial groups will help in analyzing the OSA risk specific to each group and role of confounding factors such as income, and education, and allow for between-group comparisons.

2.2 Patients with CVD as the study population: The study is innovative in its approach as it will recruit patients with CVD as the target population. The lack of conclusive data about the relationship between OSA and CVD from the past studies, possibly due to different sampling schemes and different techniques used for assessing risk for sleep disorders, may provide an altered picture about the true direction of the correlation between OSA and CVD. This study will assess the high-risk and low-risk groups for OSA in the community who has an established history of CVD.

3. Approach

3.1. Overview of Project

Obstructive sleep apnea (OSA) has shown to affect an estimated 20 million adult Americans and is a risk factor for hypertension and cardiovascular disorders (Aggarwal, Jan, Agarwal, & Tajik, 2015). Studies have shown that the incidence of OSA in patients with cardiovascular disease (CVD) is 30 to 50 percent (Tiengo, Fadini, & Avogaro, 2008; Torres-Alba et al., 2013).

The proposed project will study the correlation between Obstructive Sleep Apnea (OSA) risk and CVD severity among a sample of 240 people living in New York City. The participants for the study will be selected from 4 primary care centers in 4 different and racially diverse neighborhoods in New York City. The sample population will be individuals aged 18 years or older who have cardiovascular disease and self-identify as one or more of the following racial/ethnic groups: Whites, non-Hispanics; Black/ African Americans, non-Hispanics; Hispanic and Asian. OSA risk will be measured with the ARES (Apnea Risk Evaluation System) Watermark questionnaire (which includes the Epworth Sleepiness Scale) and the Berlin Questionnaire. These questionnaires will provide information on daytime sleepiness, hypertension, snoring and BMI, all of which are independent risk factors of OSA. Other surveys will be used to collect socioeconomic and demographic data. In addition to examining the relationship between OSA risk and CVD severity by racial/ethnic group, we will study if factors such as low awareness of OSA, lack of access to care, and low socioeconomic status play a role in the risk of sleep apnea among the sample, including how these factors vary by race/ ethnicity.

3.2. Recruitment of Participants

The participants for the study will be recruited from 4 different primary care centers in New York City. Based on the power analysis using G*Power calculation tool, we plan to collect data for 240 patients for an alpha of 0.05 and a power of 95%. Each primary care center will be selected from a racially diverse neighborhood based on the data from US Census 2010. 60 participants from each racial group will be recruited. Borough Park was shown to have a higher percentage of White, non-Hispanic population; Bedford–Stuyvesant has a high percentage of Black, non-Hispanic population; West Queens has a high Hispanic population and Flushing has high Asian, non-Hispanic population. One primary care center from each of these neighborhoods will be the recruitment sites for the participants. Each primary care center will recruit 80 participants. The inclusion criteria for the sample will be: age 18 years or older, self-identify as one or more of the racial/ethnic groups listed above, residents of that area, with no diagnosis of sleep apnea or any other sleep disorder, having CVD (such as hypertension, stroke, arrhythmia, heart attack etc.), be the only member of the family participating in the study and consent to participate. The exclusion criteria for the study are: having a history or diagnosis of sleep apnea or other sleep related disorder, being pregnant and impaired cognitive or functional ability.

3.3. Study procedures

3.3. a. Recruitment and sampling procedure

The participants for the study will be recruited at primary care centers. Teams of study recruiters will be assigned to various data collection sites. Based on the patient data from the physician, patients having a history or currently diagnosed as having CVD such as hypertension, stroke, heart failure, arrhythmia etc. will be selected to fill an eligibility form. The eligibility form will have questions related to the inclusion criteria such as age, race, CVD diagnosis and that would decide if the patient qualifies to be enrolled into the study. Surveys will be used to collect data and each participant will be paid $20 for their participation. All the surveys will have two copies of the consent form, one copy for the participant and other to be attached with the completed survey. Both copies of the consent form will be signed by the participants before filling the survey. A total of 60 participants will be recruited from each racial group and each primary care center.

3.3. b. Informed Consent

Participation in the proposed study will be completely voluntary. An IRB approved consent form will be attached to the survey. The participants will be required to read and sign the consent form before filling the survey. The consent form will include information about the study, the principal investigator, the goal of conducting the research study and criteria to be in the study as per the IRB rules for writing a consent form. The recruitment approach and data collection procedure will comply with the Health Insurance Portability and Accountability Act (HIPAA) laws that protect the privacy of patient's medical data and health information.

3.3. c. Quantitative Data Collection Procedures

The method used for data collection will be surveys. Along with surveys, neck measurement will be taken from each participant using a measuring tape which is required to complete scoring for OSA risk in the ARES Watermark Questionnaire.

3.3. d. Incentives

All the participants will be paid $20 for their participation. After completion of the survey, participants will be given an information packet containing information about sleep apnea, how to identify symptoms of sleep apnea and some information on resources available in their community (such as nearest sleep centers etc.).

3.4. Measures

The measures used for data collection are: The ARES Watermark Questionnaire which includes the Epworth Sleepiness Scale, the Berlin Questionnaire and survey questions about demographics and socioeconomic status. To study the severity of CVD among the patients, having a history or current diagnosis of two or more CVD will be studied among the sample.

The Apnea Risk Evaluation System (ARES™) Questionnaire will be used to identify people at risk of OSA. The questionnaire includes demographic and anthropometric data, diseases associated with OSA risk (i.e. History of stroke, hypertension, diabetes or any heart disease) or history of sleep apnea, the Epworth Sleepiness Scale, and frequency rating for snoring, waking up choking and witnessed apneas. The Epworth Sleepiness Scale included in the ARES questionnaire is an eight-item questionnaire that measures daytime sleepiness which is one of the most common symptoms of sleep apnea. The ARES Questionnaire provides a score that decides the level of OSA risk among the patient. A score of 4 or 5 is considered "low-risk", a score of 6 to 10 is "high risk" and a score of 11 or more shows a "very high risk" for OSA. A study validating the ARES questionnaire has shown that ARES has a sensitivity of 0.94, specificity of 0.79, positive predictive value of 0.91 and negative predictive value of 0.86 (Levendowski et al., 2007).

The Berlin questionnaire is an 11-item questionnaire that includes questions about risk factors for sleep apnea, including snoring behavior, fatigue, and obesity or hypertension. The Berlin questionnaire is a validated instrument that is used to identify individuals who are at risk for OSA in primary and some non-primary care settings. Based on scoring for each question in each of the three categories, the patient is considered to be at high risk if two or more categories are positive (i.e. A score of 2 or more) and low risk if only one or no category is positive. The questionnaire was validated by Chung et al. in 2008 (Chung et. al, 2008).

The dependent variable for the study is an OSA risk among people with CVD and the independent variables are demographics, race and socioeconomic factors (education, marital status, income, and employment).

3.5. Data analysis.

We will use measures of central tendencies and dispersion for continuous data and frequency distributions for categorical data. Chi square tests will be used to compare categorical data, and ANOVA will be used for continuous data.

3.5. a. Data storage and cleaning, Quality Assurance

The collected data will be entered into SPSS Version 22 (IBM Corporation, 2013) and will be stored in a separate computer designed for use by the OSA study coordinator and data manager. The data manager will be responsible for data entry, coding, verification, resolving or minimizing problems of missing data and clean the data for analysis.

All the participants will be given a study Id or an alphanumeric identifier to ensure the safety of the participant and the validity and integrity of the data. Such identifiers linking personal data to subjects will be maintained in a separate and secure file. The principal investigator, study coordinator and data manager will have access to the file containing personal information of the participants such as name, age, sex, address and contact information. The data will be coded and then entered into SPSS. Statistical analysis will be done using SPSS and data manager will assist the principal investigator in analyzing the data.

3.5. b. Data analysis to Achieve Aim 1

Hypothesis 1: Among CVD patients, CVD severity increases the risk of OSA.

The quantitative distribution of the variables will be expressed as descriptive statistics (frequencies, means and standard deviations, and range). The independent t - test will be used to analyze the relationship between CVD and OSA in the sample and to understand the degree to which presence of CVD is related to being at-risk for OSA.

3.5. c. Data analysis to Achieve Aim 2

Hypothesis 2: Among CVD patients, racial/ethnic minorities are at increased risk of OSA than white non-Hispanic patients.

To understand the correlation of race and risk of OSA, differences between groups in terms of level of OSA risk, age, neck size, etc., will be analyzed using Chi-square and ANOVA. The correlation will be studied among 4 groups: Patients with CVD who are White, non-Hispanic; Patients with CVD who are Black, non-Hispanic; Patients with CVD who are Asian and Patients with CVD who are Hispanic. These groups will be studied against three groups: “Low OSA risk”, “High OSA risk” and “Very-High OSA risk” among the sample. Apart from race, other sociodemographic factors such as income, education level and age will be correlated for each category of racial/ethnic group and the level of OSA risk in each category.

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BUDGET

The expected budget for the study is $45,120 for the 2-year term. The majority of the budget expenses will be allocated towards collecting data for the study and paying the staff to carry out project related activities. This includes salaries for the Principal Investigator (PI), project coordinator, data manager, participant recruiter/ data collection team, and incentives of $20 for each enrolled participant. The Principal Investigator (PI) will insure that the research goals are met within the compliance regulations and will be responsible for successful implementation of the program. The PI will hire the project staff, prepare the required applications, supervise the team, write reports and disseminate the information and the total expected time devoted to those activities will be 52 weeks (13 months). The PI will be paid $15 per hour for at least 10 hours a week.

The project coordinator will be responsible for providing administration and coordination support for the study and will also insure proper communication with the partner recruitment sites. The expected time devoted to the project to carry out assigned activities for the project will be about 36 weeks (9 months) and the project coordinator will be paid $15 per hour for at least 10 hours a week. The data manager will be responsible for data entry, data coding and data analysis for the project. The expected time devoted to the project will be 48 weeks (12 months) and the data manager will be paid $15 per hour for at least 10 hours a week. Each data collection site will be allotted 2 study recruiters making a total of 8 study recruiters for the project. We plan to pay $10 per hour for 10 hours a week to each recruiter for an estimated 9 months of data collection. Therefore, the total direct expenses for the project are estimated to be $28,800.

The total indirect costs are estimated to be $16,320. The indirect costs include the travel costs, office supplies, computer and software for data management and analysis. The cost of statistical package software to carry out data analysis is $6000. The total cost associated with materials and supplies includes printing of questionnaires, stationary, printer ink, data backup and other office supplies. Projected travel expenses include trips to the recruitment sites by the recruitment staff and trips by the PI and project coordinator for meetings with the recruitment sites. In addition, we also request 10% overhead expenses to cover additional costs.

BUDGET ITEM	**AMOUNT**	**SUB-TOTAL**
1. **Direct Costs**		
a. Personnel		
Principal Investigator	$ 7800	
Project Coordinator	$ 5400	
Data Manager	$ 7200	
Study Recruiters (8)	$ 3600	
b. Incentives for participants (240 participants)	$ 4800	
Total Direct Expenses		**$28,800**
3. **Indirect Costs**		
Office Supplies	$ 3000	
Travel expenses	$ 3000	
Statistics Software	$ 6000	
Overhead expenses	$ 4320	
Total Indirect Expenses		**$ 16,320**
TOTAL EXPENSES		**$45,120**

TIMELINE

The project timeline is presented in the Table 1 below. The study is compatible with a 2-year time frame. During the first 5 months, project staff (study recruiters, data manager, and project coordinator) will be hired and IRB consent will be approved. An estimated 2 months for selecting the data collection sites, i.e. the primary care centers from selected neighborhoods and 2 months for training of the team members will be needed. The expected time for data collection is about 9 months and 6 months of data analysis, report writing, and dissemination of information and study findings to the community member, Community-Based Organizations, primary care centers and health agencies.

Table1. Project Timeline

Project Activity	Year 1	Year 2	Key person responsible
Hiring project staff	**X**		Principal Investigator (PI)
IRB application	**X**		PI
Selecting data collection sites	**X**		PI, Project Coordinator
Team orientation and training	**X**		PI, Project Coordinator
DATA COLLECTION:			Study recruiters
Database setup	**X**		Data manager
Participant enrollment	**X**	**X**	Study recruiters
DATA MANAGEMENT	**X**	**X**	Data manager
Data entry, coding and cleaning	**X**	**X**	Data Manager
DATA ANALYSIS		**X**	PI, Data Manager
Report writing		**X**	PI, Project Coordinator
Focus groups/ Information dissemination		**X**	PI, Project Coordinator

A review of types of safer sex practices among adolescent and young adult females in the United States

A Paper Presented to the Faculty of the Department of Health and Nutrition Sciences

Brooklyn College

In Partial Fulfillment of the Requirements for the Degree of Master in Public Health

By:

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Abstract

Background: Sexually transmitted diseases (STDs) and unplanned pregnancy continue to disproportionately affect female adolescents and young adults in the U.S. **Problem:** There are numerous available safe sex methods available for adolescent and young adult females, though there is no singular method that provides adequate protection against both STDs and pregnancy. With no one method providing complete protection, the practice of dual use methods (i.e., both condoms and hormonal/IUD protection) should be encouraged. **Methodology:** A systematic literature review was conducted using peer-reviewed articles gathered from online databases published between 1997-2014. The search was performed using key words such as "condoms," "adolescent condom use," "predictors of condom use," "risky sexual behavior and adolescents," " parental views on condom use," " rates of STDs," "oral contraceptives and adolescents," "dual use and adolescents," and "sexual education". Eighteen articles were reviewed. **Findings:** Race/ethnicity, age, level of education, age of sexual debut, type of health insurance, and perceived risk are all important factors in determining a female's choice behind safer sex practices. Rates of dual use, the most complete method of safe sex, remain low across all groups within the studied population. **Implications**: Adolescents and young adults need to be educated in the importance of using both condoms and hormonal/IUD protection to mitigate the risks of STDs and pregnancy. This population should be educated in the importance of continuing condom use even after the initiation of hormonal/IUD methods.

Introduction

Sexually transmitted diseases (STDs) and unplanned teen pregnancy remain a problem that disproportionally affects the adolescent and young adult population of the United States (East, Jackson, O'Brien, & Peters, 2007). Adolescence is defined as the years between 15 and 19 years old. According to World Health Organization (WHO), young adult refers to those aged 15-24, an overlap between adolescence and post adolescence (East, Jackson, O'Brien, & Peters, 2007). Sexually transmitted diseases are infections that can be acquired through sexual activity with an infected partner (Centers for Disease Control [CDC], 2011a; National Institute for Health [NIH], 2014). There are over twenty types of STDs (NIH, 2014). Herpes simplex virus type 2 (HSV-2), or genital herpes, hepatitis B (HBV), and human immunodeficiency virus (HIV) are all lifelong infections that make up about a quarter of STDs, but others can be treated and cured if detected and diagnosed (CDCa, 2013). Teen pregnancy has also been associated with a lifelong negative impact. An increase of safer sex practices among female adolescents and young adults may help to mitigate the risks of STDs and unplanned pregnancy among the female adolescent and young adult population of the United States.

Background and statistical overview

STDs represent a serious public health problem, with an estimated prevalence of 110 million cases in the United States and an estimated 20 million new cases each year (CDC, 2014). In addition to the health consequences of STDs, there are also serious financial implications. The CDC (2014) estimates that STDs cost the United States about $16 million per year in healthcare costs. Moreover, the actual prevalence rates of some STD cases likely surpass the numbers reported by the CDC due to undiagnosed cases and infections such as human papillomavirus (HPV) and genital herpes that are not reported to the CDC (CDC, 2013a). In the

United States, almost half of the new cases of STDs occur among adolescents and young adults aged 15-24 years old (CDC, 2013a). Every year approximately one in four sexually active 15-24 year olds will contract some type of STD (Kaiser Family Foundation [KFF], 2013a). Young adults and adolescents aged 15-24 years old account for 26% of newly reported cases of HIV, which is mostly acquired through sexual contact (KFF, 2013b).

Female adolescents and young adults are an important population to consider because women may be less likely than men to have symptoms of STDs, or their symptoms may be less noticeable, making it more difficult to diagnose. For example, men may develop sores on their penises from STDs that are more visible than a genital ulcer would be inside the vagina (CDC, 2011a). When compared to older women, young women are more vulnerable to sexually transmitted diseases because of higher rates of cervical ectopy in young women, a common biological process that can occur during adolescence and, "is thought to increase risk … by exposing columnar epithelium to a potential infectious inoculum" (Chambers & Rew, 2003; Lee, Foley, & Tobin, 2006, pp.104). Moreover, many adolescent females have little knowledge of the symptoms of STDs allowing the disease to go undetected and thus undiagnosed (East et al., 2007). Health complications can affect men and women, but young women face the most serious long-term effects, including infertility (CDC, 2014). Other risks associated with untreated STDs include pain, cervical cancer, and pelvic inflammatory disease (Paterno & Jordan, 2012).

Aside from their high risk for STDs, female adolescents in the United States are also at a high risk for unintended pregnancy. In 2009, the birth rate among U.S. teens decreased to 39.1 births per 1,000 females, a 37% decrease from the birth rate of 61.8 per 1,000 females in 1991. Despite this decline, the United States still has some of the highest rates of adolescent pregnancy

in the developed world (Chambers & Rew, 2003). In fact, the teen birth rate in the United States is as much as nine times higher than other developed countries (CDC, 2011b). Teen pregnancies account for roughly 10% of births in the United States, as well as one in four of non-marital births (Basch, 2011; Patel & Sen, 2012).

Teen pregnancies in the United States are associated with high economic and social costs. The total U.S. government expenditure of teen pregnancy was $11.3 billion in 2006 (Patel & Sen, 2012). Babies born to adolescents are more likely to have lower birth weight and higher rates of death in infancy than seen in pregnancy from adults (CDC, 2011c). Teen mothers themselves also experience adverse effects. Studies indicate strong associations between teen pregnancy and low employment, low levels of education, and low socioeconomic status (Patel & Sen, 2012). Teens that become pregnant are also less likely to finish high school and college. Unfortunately, children born to teenage mothers are also more likely to become teen moms themselves (Basch, 2011).

Racial and ethnic differences in sexual behavior. According to the 2011 Youth Risk Behavior Survey (YRBS), about half of (46%) of American female high school students have engaged in sexual intercourse (CDC, 2011c). Among females, black students are more likely to engage in sexual intercourse (58%) than white (45%) and Hispanic (45%) adolescents. For male students, black adolescents (72%) reported the highest rates of sexual intercourse when compared to Hispanic (53%) and white (40%) students (CDC, 2011c). Among white teens, the birth rate was reported as 25.6 per 1,000 females (CDC, 2011c). In 2009, the birth rate among black teens was 59 per 1,000 females and 70.1 per 1,000 females among Hispanic adolescents (CDC, 2011c). While there has been an overall decrease in sexual intercourse among male and

female students, there has been no decline of sexual intercourse among white female students, Hispanic female students, or Hispanic male students (CDC, 2011c).

Little research exists on the sexual practices of Asian/Pacific Island adolescents, but adolescents of other races and ethnicities tend to have higher rates of STDs and pregnancy than Asian and Pacific Island adolescents. It is important for researchers to further assess the sexual behavior of Asian and Pacific Island adolescents, as Asian and Pacific Islanders are one of the fastest growing populations in the United States (Schuster, Bell, Nakajima, & Kanouse, 1998). The research that does exist indicates that white adolescents are 2.3 times more likely to communicate about STDs than Asian adolescents. This finding may signal that Asian adolescents may be a more vulnerable and harder to reach population than white adolescents (Hou & Basen-Engquist, 1997).

Use of protection. According to the 2011 YRBS, 15.1% of American female high school students did not use any sort of protection in their last sexual encounter (CDC, 2011c). Research shows a decrease in condom use as students progress through high school. Basch's study reveals condom use decreased from 69.3% amongst 9th grades to 54.2% amongst 12th graders (Basch, 2011). These statistics indicate the continued public health problem affecting this population and further emphasizes the importance of understanding the predictors of safer sex practices.

Much of the previous research has been focused on condom use as an indicator of safer sex practices, but Healthy People 2020 encourages dual use protection among adolescents since condoms provide only modest protection against pregnancy. Condoms have a 2% pregnancy rate when used ideally and up to a 17.4% pregnancy rate when used typically (Brown, Hennessy, Sales, DiClemente, & Salazar, 2011; CDC, 2013b; Ott, Adler, Millstein, Tschann, & Ell, 2002; O'Leary, 2011). Dual use is defined as combining the use of a condom with a form of hormonal

contraception such as oral contraceptives (Morroni, Heartwell, Edwards, Zieman, & Westhoff, 2014). Since female adolescents in the United States report low rates of dual use, it is important to understand the factors behind the choice for each method of protection including no protection, condom use only, non-barrier protection only, and dual use methods to properly address the issues that may affect dual use.

Dual use barriers

Adolescents in general associate condom use with pregnancy prevention only. Holding true to that belief, once female adolescents switch to contraceptives, condom use tends to decrease. Only one in six female adolescents use condoms partnered with another form of contraception (Chambers and Rew, 2003). A problem among the general adolescent population is the ambiguity of the terminology "safer sex" and "contraception". Safer sex applies to preventing the transmission of diseases as well as preventing unplanned pregnancy. Contraception only applies to avoiding pregnancy (East et al., 2007). The ambiguity leads to the misconception that even non-barrier contraceptives are a safer sex practice protecting against both STDs and pregnancy. In fact, one in five adolescents believe that an oral contraceptive pill is effective against the risk of STDs (KFF, 2013b). Unfortunately there is no one form of protection that defends against both STDs and pregnancy. Male condoms only provide modest protection against pregnancy when compared to other forms of protection (Tyler et al., 2014). Conversely, non-barrier forms of protection such as oral contraceptives provide high protection against pregnancy, but do not protect against STDs (East et al., 2007; Tyler et al., 2014).

Since each form of protection carries its own benefits and risks, Healthy People 2020 encourages dual use protection among female adolescents and young adults to create a more complete safer sex practice (HHS, Healthy People 2020, 2013). In order to achieve the highest

rates of protection against both STDs and pregnancy, it would be prudent to encourage the dual use of condoms and non-barrier pregnancy protection.

Table 1. Classification of types of safe sex practices

Category	Description
Condoms only	• Male or female condom
Non-barrier only	• Hormonal methods (oral contraceptives, patches, injections, vaginal rings, emergency contraceptive pills) • Implantable rods • Intrauterine devices
Dual Use	• Male or female condom plus a non-barrier form of contraception (see above)
No protection	• Includes withdrawal and fertility awareness based methods (ovulation tracking)

Methodology

A literature search was conducted using peer-reviewed articles gathered from online databases and statistical reports collected from government and foundation websites for my research. I performed my search using key words such as "condoms," "adolescent condom use," "predictors of condom use," "risky sexual behavior and adolescents," "parental views on condom use," " rates of STDs," "oral contraceptives and adolescents," "dual use and adolescents," and "sexual education." The search was limited to English language only publications published primarily between 1997 and 2014. The search was not limited to studies in the United States. Studies that focused primarily on males and adults over the age of 24 years were excluded. Overall 18 studies were reviewed.

Findings

This paper explores the differences amongst female adolescents and young adults, 15 to 24 years of age, and their choices behind various forms of safer sex practices. In a review of 18 research articles, I examine the attributes of female adolescents and young adults who use methods of protection within the following four categories: no protection, condoms only (e.g. male and female condoms), non-barrier protection only (e.g. oral contraceptives, intrauterine devices, and shots), and dual use, i.e., condom and non-barrier protection together. Social and demographic factors emerged as consistent themes in understanding the use of safer sex practices among female adolescents and young adults. These factors are further explained in Table 2.

Condom use only

Eleven studies focused on condom use among female adolescents and young adults. Most research showed condom-only practices were the most common form of protection among female adolescents and young adolescents.

Demographic factors. Certain demographic factors can have an effect on the likelihood of condom use among female adolescents and young adults. These factors include race/ethnicity, age, and education (Manlove, Ikramullah, & Terry-Humen, 2008; Paterno & Jordan, 2012). For example, according to the 2011 YRBS, 34.7% of African American adolescents reported not using a condom in their last sexual encounter, where as 41.6% of Hispanic adolescents reported not using a condom. The YRBS also stated that 40.5% of white adolescents and 33.8% of American Indian/Alaskan adolescents reported not using a condom. The percentage of Asian adolescents not using a condom was reported as N/A, since the YRBS only reported percentages for races and ethnicities for which statistical significance was found (CDC, 2011c). While none of the previously stated percentages are desirable, it is clear that

there are discrepancies in condom use among various populations. According to Manlove, Ikramullah, and Terry-Humen (2008) African Americans adolescents report higher condom use than other races and ethnicities. This finding is further exemplified by the YRBS findings stated above. According to YRBS, African Americans had the lowest rates of no condom use (34.7%) compared to other races and ethnicities (CDC, 2011c). First generation Hispanic adolescents are only half as likely as white adolescents to report consistent condom use (Manlove et al., 2008). Adolescents and young adults who are either African American or Hispanic were more likely to use condoms alone over dual use if compared to white adolescents (Tyler et al., 2014; Cavazos-Rehg, 2010).

Age and education. Females with less than a 12th grade education were also more likely to report condom-only use over dual use. Younger adolescents may be more likely to use condoms only than any other method of protection. Some studies indicated that those aged between 15-19 were more likely to use condoms only when compared to older adolescents. Other studies showed that those less than 17 years old were more likely to use condoms only (Tyler et al., 2014; Ott et al., 2002). Generally, those towards the younger end of the 15-24 year old age range are more likely to use condoms only.

Social factors. An important factor of condom use among adolescents and young adults was the perceived risk of STDs. Those who reported a high self-perceived risk of STDs continued to report consistent rates of condom use (Ott, Adler, Millstein, Tschann, & Ellen, 2002). When a female felt there was a high risk of STD, she was more likely to use a condom during sex. Health insurance was also a significant variable among females who use condoms only. Those with no health insurance were more likely to use condoms only when compared to those with health insurance. This may be due to a lack of access to prescriptions for other

methods (Tyler et al., 2014). Adolescents who are looking for low cost measures of protection also report condom-only use (Cavazos-Rehg, 2010). Another interesting factor associated with condom-only use was found among females without previous pregnancies. Females who were never pregnant were more likely to use the condom-only method over the dual use method (Tyler et al., 2014).

Relationship type. Partner type is also a significant factor in condom use among female adolescents. Research indicates that female adolescents and young adults are more likely to use condom-only protection with casual partners (Tyler et al., 2014). Females entering into new relationships were likely to use only condoms during sexual intercourse. Females who did not yet trust their new partners used condoms more than those in steady relationships. Overall, trust is an important issue in female adolescents deciding to use a condom. Those who reported high levels of trust felt that they no longer needed to use a condom (Roye, 2001).

Age of sexual debut. Age of sexual debut played a role in females using only condoms for safer sex protection. Those who initiated sexual intercourse at a later age seemed the most likely to use the condom-only method of protection. Tyler et al. (2014) found that those who were 18 or over at sexual debut tended to use condoms alone as their regular form of protection. Additionally, adolescents who used a condom at their sexual debut were more likely to consistently use condoms during later encounters than those who did not use a condom at sexual debut (Shafli, Stovel, & Holmes, 2007).

No protection

No protection is unprotected sex, but can include the use of methods that do not provide effective protection against STDs and pregnancy. Withdrawal, also known as the pull out method is included in the no protection category. Five studies focused specifically on no

protection as a category for safer sex. Despite the high levels of risk faced by adolescents, many still forgo protective measures. According to the CDC YRBS, while 35.2% of female adolescents were sexually active, 15.7% did not use any form of protection (CDC, 2013c).

Demographic factors. Higher rates of unprotected sex were seen in Hispanic adolescents and young adult females when compared to females of the same age of other races and ethnicities (American Academy of Pediatrics, 2013; Cavazos-Rehg, 2010). According to 2013 YRBS, 23.7% of Hispanics, 21.2% of blacks, 11.9% of whites, and 13.7% of those with multiple races participated in unprotected sex. The survey did not provide statistics for Asians, Native Americans, or Native Hawaiian/other Pacific Islanders because the subgroup sizes were too small to produce significant findings (CDC, 2013c). Lower socioeconomic status may be associated with higher rates of risky sexual behavior among adolescents, which includes not using protection during sex (Manlove et al., 2008). Rates of unprotected sex were lowest among those with some college education (Tyler et al., 2014).

Social factors. Female adolescents and young adults were most likely to use no form of protection with main partners (27.4%) when compared to casual partners (18.9%). Main partners were defined as someone the female was serious about (Ott et al., 2002). Females were also less likely to use protection if she felt that there was a low risk of getting pregnant and acquiring STDs (Ott et al., 2002). Sexual debut was an important factor in predicting safe sex protection among female adolescents and young adults. Rates of practicing safe sex increased as the age of sexual debut increased (Cavazos-Rehg et al., 2010). Research by Manlove and associates found that the lack of any type of sexual education may lead to lower rates of safe sex practices among adolescents. Statistically, adolescents who did not receive formal sex education were two times less likely to use protection at sexual debut (Manlove et al., 2008; American Academy of

Pediatrics, 2013). Poor timing of parental sex discussions has been associated with lower rates of safer sex protection. Maternal discussions about safe sex prior to an adolescent's first sexual encounter may lead to a higher likelihood of prolonged safe sex practices, but sex discussions that occur after sexual debut did not prove to be significant (Millier, Levin, Whitaker, & Xu, 1998). The research on education was limited to the umbrella of safer sex practices and did not provide information specific to the type of method used.

Non-barrier methods only

The non-barrier only category refers to the use of a type of intrauterine device or hormonal method without the added protection of a condom. This category encompasses the use of hormonal methods such as oral contraceptives, contraceptive patches, injectable birth control, vaginal rings, and copper and hormonal intrauterine devices. Six studies focused on the non-barrier method of protection. Hormonal contraceptives and intrauterine devices provide high levels of protection against pregnancy, reporting annual failure rates of 9% and between .2%-.8% respectively (CDC, 2014). Both percentages reflect typical use of these methods rather than perfect use. Most of the studies reviewed focused on hormonal methods of contraception, specifically oral birth control pills over intrauterine devices. This may be due to the low rates of IUD use among adolescents. According to YRBS, only 1.6% of those surveyed used an IUD (CDC, 2104). Intrauterine devices and hormonal methods of contraception are reported to be the most successful approaches to prevent pregnancy, but neither strategy offers protection against STDs (Morroni et al., 2014; Tyler et al., 2014).

Demographic factors. Oral contraception has been reported among the most commonly used methods of hormonal contraceptives (Morroni et al., 2014). Some studies even found that "the pill" was more common than condom use among adolescents and young adults. "The pill"

typically refers to the oral contraceptive hormonal method. Bearinger and Resnick (2003) found that 43.8% of those interviewed used an oral contraceptive, compared to 36.7% who used a condom (2003). The tendency to use only a non-barrier method over other methods may be associated with demographic factors including race, age, and level of education. Non-barrier use was found to be highest among non-Hispanic whites and least common among Hispanics (CDC, 2014; Tyler et al., 2014). According to YRBS, the use of hormonal methods alone was found to be lowest among 9th grade females (14.7%) when compared with 10th grade (19.2%), 11th grade (23.2%), and 12th grade (27.6%) females (CDC, 2014). Females over 17 and those that reported high school as the highest level of education were most likely to report using a non-barrier method as the only form of protection (Tyler et al., 2014).

Relationship status. Three studies also found that relationship status was strongly associated with a female deciding to use only a non-barrier method of protection. The majority of adolescents using only a non-barrier contraceptive were in long term relationships. These adolescents also reported sexual activity with only one male partner (Roye, 1997; Tyler et al., 2014). One study found that female adolescents were more likely to use only a non-barrier method with a main partner (23%) when compared to the 5.4% who only use the same method with a casual partner (Ott et al., 2002). Roye and Seals (2001) found that female adolescents reported using only a non-barrier method if there was a significant amount of trust in the relationships. Age of sexual debut was also associated with using only a non-barrier method of protection. The research found females younger than 16 at age of sexual debut to be most likely to use only a non-barrier method of protection (Tyler et al., 2014).

Perceived risk. Perceived risk and views on pregnancy were also indicators of using only a non-barrier method. Those who had a high-perceived risk of pregnancy but a low-

perceived risk of STDs were likely to use only a non-barrier method (Ott et al., 2002). The females using only a non-barrier method were also less likely to have been recently tested for an STD (Tyler et al., 2014). Adolescents and young adults who reported using only a non-barrier method of protection tended to view pregnancy with their main partner as highly negative (Ott et al., 2002).

Dual use methods

Dual use refers to the combination of a non-barrier method coupled with either a male or female condom. As previously stated, aside from abstinence, there is no single safer sex practice that promises complete protection against both STDs and pregnancy (Bearinger & Resnick, 2003). To provide full protection, it is now recommended for adolescent and young adult females to practice dual use. Condoms can provide protection against STDs and pregnancy, but the failure rate of condoms among this population can be as high as 18% (CDC, 2014). Since correct and consistent condom use was found to be low among adolescents and young adults, dual use is the preferred method of protection (Tyler et al., 2014). Eleven studies focused on the dual use method of protection. Many of the studies reviewed were cross sectional. While statistics of dual use among adolescents and young adults ranged from as low as 3%-5% among some populations to as high as 14%-20% among other populations, overall dual use among female adolescents and young adults in the United States remains quite low (Morroni et al., 2014). In fact, according to YRBS, national dual use is reported at only 8.8% (CDC, 2014).

Many studies have expressed an inverse relationship between condom use and initiation of hormonal methods. As oral contraceptives, or other hormonal methods are initiated, condom use was found to decrease (Ott et al., 2002; Morroni et al., 2014; Tyler et al., 2014). Studies have indicated that adolescent and young adult females who use non-barrier protection were less

likely to use condoms than other sexually active females (Roye, 1997). Upon initiation of hormonal methods/IUDs, adolescent and young adult females decrease condom use stating that there is adequate pregnancy protection from the hormonal or intrauterine device (Roye, 1997). One study even found that 48% of participants discontinued condom use within six months of beginning oral contraceptives (Morroni et al., 2014). While interviewing adolescent girls about condom use, one young female stated that she did not use a condom because she was on the pill and could not get pregnant (Roye & Seals, 2001).

Demographic factors. According to the results of the last YRBS, dual use rates differ by race/ethnicity. White females were more likely to report dual use than black and Hispanic females. Hispanic females were the least likely to practices dual use, with only 3% of those surveyed reporting this practice (CDC, 2014). As stated previously, there was not enough data on other ethnicities for the YRBS report to derive reliable statistics. As with non-barrier methods, age and education were associated with rates of dual use. Dual use was highest among adolescent and young adult females with some college, as well as among females over the age of 17 or 18 (Ott et al., 2002; Tyler et al., 2014). The studies could not definitively determine if age and education were singularly associated with dual use since age and level of education may be a proxy for one another.

Social factors. A female's age of sexual debut was also associated with the tendency to practice dual use. Females 18 and older at sexual debut were more likely to utilize dual methods than those who were younger than 18 at sexual debut (Tyler et al., 2014). Health insurance was also associated with rates of dual use among this population. Tyler and associates (2014) found that dual use rates were highest among females with access to private health insurance and lowest among those with no health insurance. Those with public health, i.e. Medicaid, reported

higher rates of dual use than those with no health insurance (Tyler et al., 2014). Adolescents and young adults who reported receiving welfare within the last 12 months were less likely to practice dual use methods when compared with those not receiving welfare (Tyler et al., 2014).

Perceived risk. Adolescents and young adults tend to view any measure of protection as a way to prevent pregnancy only. An important barrier to dual use is the desire to avoid pregnancy over disease among this population (O'Leary, 2011). Adolescents may be more familiar with the concept of pregnancy and can more easily visualize the associated risks (Roye, 1997). One study found that there were similarities between those who used a condom for protection against both STDs and pregnancy and the likelihood of dual use rates (Tyler et al., 2014). When a female had a high-perceived risk of STDs and previously used condoms to prevent against them, she was less likely to forgo condom use once a non-barrier method, such as oral contraception, was initiated (Ott et al., 2002; Tyler et al., 2014). Females who practiced dual use were concerned with protecting against both disease and pregnancy. Females who had been previously diagnosed with an STD were also likely to practice dual use (Tyler et al., 2014).

Relationship type. Relationship status was associated with dual use rates among this population. Females in monogamous relationships reported decreased rates of condom use among those who were using a non-barrier method of protection. Using non-barrier methods did not affect condom use among adolescents and young adults in casual relationships. This finding reflects higher rates of dual use among casual relationships than main partner relationships. (Ott et al., 2002; O'Leary, 2011; Tyler et al., 2014). In one study, only 13.9% of females reported dual use with a main partner, compared to 23.4% of females who reported dual use with a casual partner (Ott et al., 2002). Females who reported not trusting their partners were more likely to

report higher rates of dual use since these females were less likely to forgo condom use once initiating non-barrier protection (Roye & Seals, 2001).

Table 2. Findings based on review of 18 articles

	Demographic Factors			Social Factors				
Method of protection	**Race/ Ethnicity**	**Education**	**Age**	**Perceived risk of pregnancy**	**Perceived risk of STD**	**Partner type**	**Age of sexual debut**	**Health insurance**
No protection	African Americans and Hispanics most likely	≤ 12th grade	9th grade	Low	Low	Main	< 15 years old	Public
Condoms only	African Americans most likely	≤ 12th grade	< 17 years old	Not significant	High	Casual	≥ 18 years old	None
Non-barrier only	White non-Hispanics and Hispanics most likely	HS graduate or equiv.	> 17 years old	High	Low	Main	≤ 15 years old	Private
Dual method	White non-Hispanic most likely	College degree or some college	≥ 18 years old	High	High	Casual	≥ 18 years old	Private

Note. Three of the studies reviewed discussed sexual education and its relation to safer sex practices among adolescent and young adult females. The research found that those who receive sexual education are more likely to practice safe sex. The research did not specify which forms of protection increased as a result of receiving sexual education.

Discussion

This paper reviewed the factors behind the safer sex choices among adolescent and young adult females in the U.S. The studies reviewed support the importance of increasing the occurrence of dual use for safer sex among U.S. adolescent and young adult females. All of the studies reported low rates of dual use practices when compared with other methods including, no protection, condom use only, and non-barrier methods. Age, education, race/ethnicity, perceived risk, partner type, age of sexual debut, and type of health insurance were all factors which affected safer sex choices among this population. Continuing to understand these factors will help to promote and increase the rates of dual use among adolescent and young adult females.

Strengths and weaknesses of literature

A major strength of the existing literature was that the studies focused on adolescents and young adults who did not intend to get pregnant in the near future. Removing these females from the data pool helped to ensure that those forgoing specific methods were not doing so in order to achieve a certain result. Another strength was the type of study design used in two of the studies. Bearinger and Resnick (2003) used a longitudinal study and Morroni and associates (2014) used a cohort study. This allowed both studies to include the effects of time as a factor of choices.

Conversely, the existing research also has many limits. Firstly, there are still many studies conducted that do not compare rates of dual use with other methods. The YRBS only began collecting data on dual use in 2011. With no previous data, the most recent YRBS was unable to provide trends and analysis for dual use rates. Another limitation is that most of the studies are cross-sectional. There were very few prospective studies. Cross-sectional studies force researchers to draw upon inferences to determine what occurs after the initiation of non-barrier methods. Studies also often questioned participants about the method used “at last sex.”

Using this method may not portray an accurate picture of a female's typical safe sex method of choice. The study performed by Ott and associates may have been biased since participants were recruited from HMO clinics. This study may have investigated a specific population that was not representative of the whole population. Lastly, the studies all used self-reported data. Adolescents and young adults may not be truthful when reporting preferred and typical safer sex methods. Participants may exhibit social desirability bias and try to provide the responses they deem to be socially acceptable.

Issues examined in literature

Sexual Education. As stated in the findings, females who did not receive sex education were twice as likely to forgo protection during their first sexual encounter (American Academy of Pediatrics, 2013). Despite the benefits associated with sex education, many states still choose to encourage abstinence focused sexual education programs. A national level data analysis found that abstinence-only education does not reduce teen pregnancy. In fact, the same study found that abstinence-only education might actually increase rates of teen pregnancy (Stranger-Hall & Hall, 2011). The United State has two types of federal funding for sexual education: abstinence-only education funding and funding for research and evidence based prevention programs. States can now determine the best education option to prevent teen pregnancy. Of the 48 states analyzed, 21 states opted for abstinence-based education in their state laws and policies on sexual education. Eleven states covered abstinence simply as a measure of safe sex and nine states did not mention abstinence at all. The level of abstinence education was positively associated with teen pregnancy rates. The states that promoted abstinence-only had higher rates of teen pregnancy. States with less emphasis on abstinence saw lower teen pregnancy rates (Stranger-Hall& Hall, 2011).

As demonstrated above, research implies the importance of adolescents receiving comprehensive sex education. Comprehensive sex education discusses abstinence, but also educates students about condoms and contraceptives (Kirby, 2007). Regardless of which form of sexual education is taught, it seems that the information does not necessarily have to be factual. According to the National Conference of State Legislatures, only 19 states require that when provided, sex education must be medically factual or technically accurate. Additionally, 35 states and the District of Columbia give parents the choice to opt-out of sexual education for their children (National Conference of State Legislatures [NCSL], 2014). This implies that even if adolescents could potentially receive sexual education, they can be either getting the wrong information or be denied the education as requested by their parents. Most of the research reviewed only discusses the effects of sexual education on teen pregnancy but not on STDs. It would be prudent for research to observe the effects of education about STDs in order to understand how to best promote dual use practices among adolescents and young adults. As stated above, adolescents and young adults themselves are also more concerned with pregnancy than disease. The lack of research on the effects of sex education on the rates of STDs displays an important limitation. Adolescents and young adults need to be educated about the continued risks of STDs.

Health insurance. Research found that health insurance was associated with the choice of safer sex practices among adolescent and young adult females. One study found that those with private health insurance were more likely to practice dual use than those with government health insurance or no health insurance (Tyler et al., 2014). Those without health insurance may have less access to prescription contraceptives. Without access to prescriptions, these females may not have been able to attain oral contraceptives, one of the most popular non-barrier

methods of protection (Morroni et al., 2014). It will be interesting to see if these statistics change in future studies after the full implementation of the Patient Protection and Affordable Care Act. Since the PPACA mandates health coverage for most Americans, more people should have access to prescription use. Furthermore, some insurance plans will not charge a co-pay for certain brands of contraceptive options under the PPACA (KFF, 2014). By removing the financial cost, females may be more likely to opt for use of non-barrier methods as an added component of safer sex practices.

High-risk groups. Some studies reviewed high-risk groups of adolescents and young adults. High-risk groups are made up of adolescent and young adult females at greater risk for unintended pregnancy and STDs because of their risky sexual behavior such as a high number of sexual partners and early sexual debut (Tyler et al., 2014). Unfortunately, high-risk groups are even less likely to practice dual use methods of protection. One study found that females who reported six or more partners were less likely to report dual use (O'Leary, 2011). This finding may conflict with other studies that found higher rates of dual use among those with multiple casual partners, but it is important to understand that there may be females within the high-risk pool who are not practicing the best methods of safer sex practices. Those who are at a higher risk of pregnancy and disease because of riskier behaviors may be continually putting themselves in high-risk situations.

Perceived risk. Perceived risk was a common factor of dual use across many of the studies. Most females in this population were less concerned with the risk of disease than the risk of pregnancy (Roye, 1997). Viewing contraceptives only as a way to decrease the risk of pregnancy may be related to adolescents and young adults forgoing condom use after the initiation of oral contraceptives or other non-barrier methods. As discussed above, condom use

tends to decrease after a female begins to use a hormonal/IUD method of contraception, which may create a new risk pool of adolescents. One study reported relatively new concerns about a possible risk of an increase of HIV among oral contraceptive users since users are unlikely to continue condom use (Morroni et al., 2014). Two studies interviewed adolescents and young adults about past condom use, and both studies reported females stating that condoms were not used at last sex because there was no longer a risk of pregnancy after beginning oral contraceptives (Ott et al., 2002; Roye & Seals, 2001).

Parental discussion. Discussing sex is considered a private matter in the United States, and adolescents report that sex is the topic most avoided with their parents. Mothers who are not confident in their knowledge of sexuality and STDs tend to communicate less effectively about condom use (American Academy of Pediatrics, 2013). Some parents feel that they do not have the skill set to discuss such issues with their children and tend to shy away from this type of conversation (Afifi, Joseph, & Aldeis, 2008). When parents communicate openly with their children about sexual issues, these children are more likely to delay sexual initiation, have fewer partners, and practice safer sex (O'Sullivan, Meyer-Bahlburg, & Watkins, 2001). Interestingly, many parents discuss the risks of sexual behavior such as HIV, STDs, and pregnancy, yet only one quarter of parents advise their children on where contraceptives can be obtained to prevent against said risks (Afifi, Joseph, & Aldeis, 2008). Research in this area is often inconsistent due to a lack of standard to measure communication between children and their parents (O'Sullivan et al., 2007).

Summary and Recommendations

The findings from the 18 articles reviewed support the need for action in order to increase the rates of dual use among adolescents and young adults. Since Healthy People 2020 added

increasing dual use rates as a goal for adolescents, this is an excellent opportunity to identify action points to achieve this goal. There are teaching opportunities that need to be addressed in order to achieve higher rates of the safer sex recommendations as set by the CDC and Healthy People 2020 (CDC, 2104; HHS, 2013). Longitudinal studies and cohort studies may best reflect the effectiveness of implemented interventions.

Recommendation #1: Educate about dual use when prescribing contraceptives

The reviewed studies showed a decrease in condom use after the initiation of hormonal contraceptives. Prescribing these contraceptives may provide a unique teaching opportunity. Physicians should take the opportunity to promote the importance of continued condom use even after beginning a non-barrier form of contraceptive. Young adults and adolescents should be reminded at this juncture that non-barrier methods do not provide protection against disease. This recommendation is directed at the professionals prescribing non-barrier methods of protection. One study analyzed a group of adolescent and young adult females at initiation of oral contraceptives and found that only 28% of participants were advised to always use a condom after beginning the use of oral contraceptives (Morroni et al., 2014). This is a strikingly low number. This is a missed opportunity for physicians to provide pertinent information to adolescent and young adult females. Physicians themselves also must be educated about hormonal contraceptives. One study found that some physicians did not prescribe hormonal contraceptives to younger adolescents because of misconceptions associated with future infertility (Swanson et al., 2103). It is important for physicians to take this learning opportunity to educate young women and raise their perceived risk of STDs.

As stated above, the implementation of the ACA may lead to higher rates of health insurance across the population. If more adolescents and young adults have access to care, there

may be an increase in the amount of females visiting physicians for hormonal contraceptives. As a result of the ACA, even more females could be educated about the importance of dual use methods at the initiation of hormonal contraceptives.

Recommendation #2: Raise Awareness of STD risks

Since findings from this review found that female adolescents and young adults are more concerned with preventing pregnancy than with protecting against STDs, it would be beneficial to raise the perceived risk of STDs among this group. Programs that focus on STDs and encourage condom use need to be implemented. These types of interventions tend to increase condom use even among female adolescents already using hormonal contraceptives (O'Leary, 2011). In addition to the lack of concern among adolescents, education programs also seem to be more focused on mitigating teen pregnancy than in reducing rates of STDs. If educators do not emphasize the risks of STDs, then young women will have a difficult time in realizing the importance of continuing to protect against STDs even after initiating a hormonal method. This recommendation is directed at the state level since states have the power to determine the type of sexual education that will be taught. With only 22 states and the District of Columbia requiring some form of sex education, many students are not receiving any sort of information about safe sex practices. Also, only 39% of high schools taught students how to correctly use a condom in their health education courses (NCSL, 2014). More states need to begin to require sex education in schools in order to emphasize the importance of protecting against not only pregnancy but also against STDs. The programs that already exist in schools should be re-focused to emphasize the risks of STDs in order to achieve higher rates of dual use.

According to the literature, those with a low-perceived risk of STDs were less likely to use condoms (Ott et al., 2002). One study performed an intervention based on an HIV

prevention program called Project RESPECT. This study provided black and Latina adolescent girls who were already on oral contraceptives with either a video, Project RESPECT counseling, both video and counseling, or usual care. Usual care consisted of no intervention. The study found that within the first three months, those receiving both interventions were more likely to have used a condom at last sex than those who received no intervention or only one form of intervention. This study found that as a result of a condom-focused intervention many of the participants became dual users (O'Leary, 2011). This study shows the importance of condom-focused interventions to increase the perceived risk of STDs.

Recommendation #3: Develop condom negotiation skills

As mentioned above, hormonal/IUD methods do not provide protection against STDs. Despite this drawback, female adolescents and young adults may be attracted to this method of protection because it does not require male participation. This is highly important because it is a method that allows the females to take greater control of their sexual experiences (Morroni et al., 2014). It is beneficial for females to be in control of these situations, but using non-barrier methods alone still leaves this population vulnerable to STDs. Female adolescents and young adults may benefit from increasing condom negotiation skills to ensure confidence in providing themselves with complete protection. This recommendation is directed at both education systems and parents as explained below.

Condom negotiation is a particularly important skill for females since males and females tend to have different beliefs regarding advantages of condoms (Calsyn et al., 2013). Female adolescents have reported lower condom use because they expect their partners to have negative attitudes towards condoms (Staras et al., 2013). Men are more likely to portray condoms negatively and often state that condoms reduce their sexual pleasure, do not fit properly, and

interrupt the mood (Calsyn et al., 2013; De Visser, 2004). Unfortunately, many males and females still consider that it is the male's role to decide whether to use a condom. This attitude affirms older cultural beliefs that females should be passive in sexual matters (French & Holland, 2013). Schools that teach sex education should incorporate condom negotiation skills to build confidence among females to effectively negotiate with male partners who have negative views on condom use. Condom negotiation can be accomplished through direct, indirect, verbal, and non-verbal strategies (French & Holland, 2013). Negotiation can include withholding sex or directly requesting a partner to use a condom, both of which have proven effective in increasing condom use. Communication is a key part of condom negotiation (French & Holland, 2013).

Parents can also teach effective communication to promote condom negotiation skills. As stated above, when parents discuss sex openly, adolescents are more likely to delay sexual initiation, have less sexual partners, and practice safer sex (O'Sullivan et al., 2001). Some research shows that sexual education programs that increase parental involvement may have a more positive impact than programs that do not increase parental involvement (Kirby, 2007). States that require sexual education need to work to incorporate communication-building skills into the curriculum. Even though some states promote abstinence-only programs, schools can still take the opportunity to develop communication skills. Even if the skill building is not explicitly directed at condom negotiation, building communication may help to increase the confidence needed for female adolescents and young adults to take control of their sexual experiences.

Conclusion

The United States reports high rates of STDs and pregnancy among female adolescents and young adults. While there are a variety of safer sex methods available to female adolescents

and young adults, no one method provides full protection against both STDs and pregnancy. To ensure complete protection, dual use methods are now being encouraged for this population. This review found that dual use rates remain quite low among female adolescents and young adults. This review also explored the various factors affecting a female's choice of protection. This information can be helpful in successfully targeting the intended population with the goal of increasing dual use rates among female adolescents and young adults in the United States.

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14 Years after *To Err is Human*: Is Surgery Safer?

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Abstract

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Abstract:

Fourteen years ago the Institute of Medicine published *To Err Is Human* which brought to light a problem that was hidden from ~~masked to~~ the public. It stated that 44,000 to 98,000 people died from preventable medical errors annually in the United States. Surgery was found to be the cause of 48 percent of these errors. Thus, surgical safety is a serious public health concern that needs to be addressed. It is important for ~~pertinent to~~ researchers and the public to better understand the data surrounding surgical safety, what interventions have been attempted to alleviate the problem of surgical errors and adverse events, and what action can be taken to make surgery safer in ~~for~~ the future.

Introduction:

The extent to which medical errors occurred wasere unknown to both the public and medical practitioners until 1999 when the Institute of Medicine (IOM) published its landmark report titled *"To Err Is Human".* The groundbreaking report galvanized the public, threw the media into a frenzy, disturbed practitioners, led to congressional hearings and formed millions of angry patients (Wachter, 2004). Understandably, much of the concern revolved around the 44,000 – 98,000 people who die from medical errors annually in the United States, comparable to a jumbo jet crashing every other day. The debate of whether their calculations are correct or exaggerated rages on (Leape, 2000; McDonald et al, 2000). Nevertheless, given their size, it should not matter whether the numbers are exaggerated or not; and the fact that a once ignored danger must now be acknowledged, researched and repaired.

Only hospitals superseded the rush of practitioners trying to understand and change the harsh reality of the report. Hospitals began scrambling to reduce their rates of adverse events. An adverse event is defined as "an unexpected occurrence involving either death, physical, physiological trauma or risk of that occurrence" (Joint Commission, 2013). The reason for this scramble was two-fold. Patient safety is obviously the major concern for all hospitals. Additionally, the monetary aspect plays an important role. Malpractice insurance and settlements totaled in the billions due to adverse events across the nation (Makary, 2012).

Expectedly, national and international organizations stepped into the mix as well. World Health Organization (WHO), National Institute of Health (NIH), Joint Commission, Agency for Healthcare Quality and Research (AHRQ) and the Institute of Medicine (IOM), as well as many others, began researching what can be done to not only reduce the risk of surgical errors but also make surgery safer

overall. Changes began straightaway. Operating room protocols have been amended, checklists have been implemented, and programs such as SCIP (surgical care improvement project) are nearing 100% compliance in nearly all United States hospitals (HHS, 2011). Despite all this, every patient safety organization will say that we are not any closer to surgical patient safety than we should be based on the known findings. Fortunately, the amount of progress made is undeniable (Wachter, 2004). In a survey by Wachter (2004), four hundred physicians were asked whether they believe patient safety was better: forty-five percent thought it had improved; thirty-eight felt it was the same and seventeen felt it was worse. The future looked even more hopeful with nearly seventy percent saying it will be better in five years compared to eleven that thought it would be worse (Wachter, 2004).

Modern surgery as we know it today is just a bit over two centuries old (Bishop, 1995). It is a miracle that a field, which is so dangerous and so embryonic, has evolved from the simplest techniques being deadly to successfully saving someone's life with a heart transplant in such a short period of time. Currently, surgery is a constantly evolving field. New research regarding the most effective, least intrusive and safest techniques is being published constantly. It was just one hundred seventy years ago that Sir John Erikson stated: "The abdomen, the chest and the brain will forever be shut from the intrusion of the wise and humane surgeon." However, today surgeons perform approximately 80,000 procedures of that nature daily (Riskin, 2006).

Thankfully, surgery is an ever-evolving field. Although progress has been made in medicine, practitioners and providers still have a long way to go. Debates continue about why the alarming rates of errors, infections, and adverse events continue. Even though a plethora of interventions have been attempted to mitigate the risk of adverse events, many experts argue that we are no closer to surgery

being safer than we were before the IOM report. This comprehensive literature review will discuss surgical adverse events, what interventional attempts have been made to mitigate those adverse events, and whether or not they have worked. Limitations of this paper are to be mentioned. Literature outside of the United States has only been included on a comparison basis. Thus, this paper focuses on surgical safety in the United States. Additionally, only studies in English have been included in this paper, which might pose data limitations on international research based in the United States. Finally, literature prior to 1991 has been excluded, although data used in some literature goes back to 1984, which might reduce applicability of this paper.

Literature Review:

Although the field of surgery is thousands of years old, modern surgery is less than two centuries old. Pioneer surgeons had three limiting factors that inhibited surgery from progressing into science: hemostasis, pain and infection (Gawande, 2012). Hemostasis, a risk of bleeding was a considerable threat when performing any invasive procedure. It was not until ligatures were invented ~~,~~ that this risk was minimized. However, when introducing a foreign object into the body a risk of infection remained a threat, and thus, ligatures only solved part of the problem. It was not until the mid-19th century that the technique of antisepsis received recognition. Throughout all this, pain to the patient remained a formidable threat~~d~~ until the administration of anesthesia became the norm when performing invasive procedures.

With the three limiting factors of surgery under partial control, modern surgery began ~~its inception~~. Surgery is a field with a history of many ups and downs. Some of that history includes innovative and successful techniques performed in the mid-19th century such as abdominal cyst drainage. However, the low points existed as well such as an amputation surgery with a three hundred percent mortality rate, in which the patient and assistant died of gangrene due to an error by the surgeon and a spectator died of shock (Gordon, 2001).

Surgical errors have been around since surgery was first performed. Doctor Robert Liston, a professor of surgery at University College Hospital in London, was the first surgeon to perform a procedure under anesthesia in Europe. Dr. Liston was a world-renowned practitioner who was able to

amputate a leg in less than two and a half minutes. However, with all the skills he possessed, his three most erroneous surgeries are the ones that forever made him famous. Mistaking an aneurysm for an abscess Dr. Liston slashed open the carotid artery of a young boy. His second most famous case involved the amputation of a leg in less than three minutes; however, due to his enthusiasm he removed the patient's testicles as well. Finally, Dr. Liston was the surgeon who performed the only surgery with a 300 percent mortality rate. During a leg amputation, the lightning quick surgeon amputated several fingers of a young surgical assistant as well. Both the patient and assistant later died of gangrene. Finally he slashed through the coat of a spectator who was terrified that the knife pierced his vitals and he died from fright (Gordon, 1995). Although Dr. Listen's cases are extreme examples, a plethora of errors still happen in the operating room every day.

It is understandable that a field that is so incredibly invasive is extremely dangerous. However, a large discrepancy must be made between medical risk and medical error (Clarke et al, 2007). Medical risk is defined as: the risk of an adverse outcome occurring when performing a procedure. Conversely, medical error is defined as: a preventable adverse event regardless of whether or not it is harmful to the patient (Hofer et al, 2000). Every surgery performed carries with it significant medical risk but surgeries should not carry a possibility of medical error in addition to that risk, or at the least work to mitigate the risk of an error occurring.

After the publication of "*To Err is Human,"* nearly every health organization became a strong advocate of increasing safety in the operating room (and health care in general). A major push occurred in 2008 from the World Health Organization (WHO). Data from fifty-six countries in 2004 showed that the annual volume of surgeries ranged somewhere from 187-281 million.

Although exact numbers of surgical errors are difficult to estimate, based on reporting from industrialized nations, the WHO derived that surgical errors occurred in 3 to 22 percent of inpatient surgical procedures, leading to a death rate of 0.4 to 0.8 percent. The large range in data is indicative of its probable imprecision and of great variances between countries. A skew exists because studies in developing countries indicate a mortality rate of 5-10 percent with major surgery. Nearly half of these adverse events were deemed to be preventable (WHO, 2008). Although the data presented was extrapolated, nonetheless it is clear that based on the evidence, avoidable surgical mortality is a significant public health concern. Although this paper focuses on surgical safety in the United States, it is important to understand international comparisons. Internationally surgical errors have been estimated at approximately seven million, leading to approximately one million preventable deaths according to the WHO. Unfortunately, the United States fares no better than the rest of the industrialized world in adverse event occurrences in the perioperative setting.

Prior to examining adverse events in surgery in the United States, it is important to discuss what exactly surgical errors are, how they differ from adverse events, where they occur, and how they are reported. According to the Joint Commission, a surgical error is an "error or mistake that is committed by health professionals that results in additional harm to the patient". Within this definition there are several subcategories**.** Most common surgical errors result from a wrong-site, wrong-procedure, wrong-patient procedure, occurring approximately in 1 out of every 50,000 to 100,000 procedures or equivalent to 1,500 to 2,000 times per year in the United States. When broken down by data from 2005 the WHO found that in the 126 cases reviewed, wrong-site surgery occurred in 76

percent of cases, 13% occurred on the wrong-patient and 11% occurred as a wrong procedure (WHO, 2008). Another type of error is referred to a retained foreign body, occurring in approximately 1 out of 5,000 to 1 out of 19,000 procedures. However, the likelihood has been estimated to be around 1 out of 1,000 procedures (WHO, 2008).

Conversely, according to the Joint Commission, "an adverse event is an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof". Serious injury specifically includes loss of limb or function. The phrase "or the risk thereof" includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome" (Joint Commission, 2011). It is important to note that the terms surgical error and adverse event are not synonymous. Not all surgical errors result in adverse events and not all adverse events transpire due to errors. For example, although a wrong-site aneurysm resection would be considered a surgical error it would not be considered an adverse event, since no death or physical injury occurred to the patient. This distinction is important since this paper focuses on surgical errors; thus, even neutral errors that cause no harm to the patient will be examined. As discussed above, surgical errors resulting in death or serious injury are considered adverse events and will be addressed as such.

Surgical errors can occur in any of the stages of the perioperative setting; preoperative, intraoperative, and the postoperative settings can all be hosts to surgical errors. Identified surgical errors have also been categorized into five types. The first type of error is known as a judgment error. These errors are caused by inadequate knowledge or failure to properly use knowledge, this includes a failure to obtain a consult or to order proper test and are the cause of approximately twenty percent of surgical errors. The most obvious way to minimize the occurrence of this type of error is proper

education of the surgical staff. The second type is a technical error; these do occur and are acknowledged as being part of the residency training process. However, defective or inappropriate equipment can result in a technical error as well. Technical errors comprise approximately ten percent of adverse events in surgery. The third type of errors is an expectations errors caused by an unskilled clinician such as a resident. It is unknown what percent of cases suffer due to this error since it is often ignored. Surgical residency programs often do not have established guidelines or milestones that are to be achieved. Thus, it is common for residents to perform tasks that they are not competent enough to do. The fourth is a systems error, which is not caused by an individual but rather by the entire process and is the cause of nearly sixty percent of all errors. The only intervention to combat this error would be an introduction of scrupulous protocols at every step of the medical and surgical process. Additionally, since no person is at fault during this type of error the traditional system of discipline is not useful to combat it. The final type of error is a mechanical error; it occurs most infrequently and is caused by mechanical equipment failure such an unsharpened scalpel (Krizek, 2000).

Currently, reporting of most adverse events – and by association most surgical errors - remains voluntary for medical providers. Thus, hospitals, outpatient clinics, and other establishments where these events occur can elect not to report an event if it does not meet the criteria described by the National Quality Forum (NQF) (Kizer and Stegun, 2005; Classen et al., 2011). The NQF is a nonprofit, public benefit corporation that was established in 1999 and became operational in 2000. The main purpose of the NQF was to improve United States health care with national standards and public reporting of health care performance data (Kizer and Stegun, 2005). Keeping to that goal, the NQF identified a list of 27 reportable adverse events. This list was not designed to be exhaustive and capture all errors. Rather, it includes errors that are 1) identifiable and measureable, 2) their nature is

influenced by the policies of the facility and 3) they are of concern to both providers and the public. To qualify for this list an event had to be unambiguous, preventable, serious and one or more of the following: 1) adverse, 2) indicative of a problem in the facility's safety systems and/or 3) important for public credibility (Kizer and Stegun, 2005). Examples of some of the 27 events are: wrong site surgery, wrong patient surgery, wrong procedure, retained foreign object, and immediate intra or post-operative death of a healthy individual. Since there is no national reporting system in the United States, only some States require reporting at least some of the types of adverse events as described by the NQF. Additional ways of adverse event exposure can result from communication of a patient, family member, an employee of the organization, or through research and the media. Is it due to this that some researchers believe that the rates of errors are grossly underestimated.

Published studies on medical errors and surgical complications depend mostly on comparable retrospective analyses or self-reporting such as incident reports. According to Krizek (2000), these are the methods of data collection that should be amended. Some problems can be caught before they occur if prospective methods were used. If constant non-punitive prospective surgical patient data is collected, errors can be caught before they occur, akin to automobile makers recalling defective vehicles before they are sent out into the market. For example, if patient records are consistently reviewed for errors while not blaming any particular clinician for possible errors Retrospective error reporting, many believe, understates the incidence of adverse events that is reported in the literature (Mulloy & Hughes, 2007). An additional reason for questionable data is due to medical record review. Traditionally, adverse event data has been collected by medical review; due to the fact that there is also a reluctance to document errors in official medical records for fear of litigation many adverse events could have never been

documented, and thus, never assessed (Krizek, 2000). The difficulty of prospective data collection has led to most analyses of current surgical error data being retrospective medical chart review and possibly flawed. Although some researchers admit the potentiality of retrospective studies being flawed, they provide us with an approximate view of the incidence of surgical error occurrences.

A highly regarded, accepted, and quoted retrospective study of New York State hospitals was done in 1991 by Harvard Medical School utilizing 30,195 medical records. The authors used fairly stringent criteria to determine the risk of adverse events that occurred during hospital stays of surgical patients. The researchers found that adverse events occurred in ten percent of patients; of these 3.7 (1133) percent were deemed critical, using their criteria. The study found that operative events accounted for 48 percent of all adverse events. Negligence was the cause of 27.6 percent of these errors. Out of this, 70.5 percent led to disabilities lasting less than six months, 2.6 percent gave rise to a permanent disability, and 13.6 percent led to death (Brennan et al, 1991). Regrettably, the study was not able to delve in deeper details and further events of surgical adverse events have been missing.

One year later, Dr. Atul Gawande used data from 1992 to follow up with a more in-depth look at surgical adverse events in Colorado and Utah. A review of nearly 15,000 randomly selected non-psychiatric discharged patients ensued; four hundred and two adverse events were identified, with an adverse event rate of three percent. Although the study found that the rate surgical adverse event occurrences were no more likely to occur than non-surgical adverse events, 66 percent of the adverse events were attributed to surgery since more patients received surgeries than other types of intervention. The incidence of such events found by Gawande et al. was three percent, slightly lower than the 3.7 percent found by Brennam et al. (1999). Of the three percent, fifty-four percent were

determined to be preventable. It was also found that 5.6 percent of surgical errors led to death. When extrapolated from the data reviewed for all surgeries in Utah and Colorado, it was determined to have led to 755 preventable deaths in the two states.

Although the variation that leads to the slight change in incidence rate in subsequent studies is unknown, the possibility of a downward trend from previous studies on error incidence rates cannot be disregarded either. The drop in identified errors from 1972, 1984, and 1992 was 4.6, 3.7, and 3 percent, respectively, suggested a downward trend (Gawande et al., 1999). Consistent with previous findings, more than half of adverse surgical events were preventable and nearly fifteen percent led to permanent injury or death (Gawande et al, 1999). The study found that most of the errors that were reviewed were intraoperative and occurred during the procedure, as opposed to postoperatively. Thus, it is clear that the preoperative setting needs improvement. Better coordination of care, as well as a preoperative evaluation of the patient, and an understanding of the procedure being performed can all reduce the possibility of an error occurring (WHO, 2008). Of course, due to the study above being retrospective, the reliability and validity of physicians' judgment and recall should be scrutinized.

Additionally, retrospective studies raise problems of the reviewer's assessment of the physicians' judgment. Some researchers believe that these numbers are underestimated, since medical practitioners are reluctant to document anything that can be interpreted as negligence (Krizek, 2000). It is due to this that retrospective studies discussing medical errors have come under scrutiny and have even been deemed inadequate due to lack of documentation. Data collected after the fact is doomed for the aforementioned reasons (Bosma, Veen & Roukema, 2011; Krizek, 2000). It is thus not all encompassing to attempt to discuss surgical safety while omitting prospective data studies.

In a prospective study done by Krizek in 2000, a total of 1047 patients were used who were admitted to three surgical units in Tampa Bay, Florida. Errors occurred in 480 patients, a remarkable 45.8% of the cohort. In this, 2183 errors or adverse events were identified, of which 462 (21.2 percent) were deemed critical (life-threatening or limb threatening). One hundred seventy-five of the patients in the cohort had at least one serious adverse event. Errors were categorized into nine areas; management complications and surgical errors comprised a large portion of the adverse events identified, 38.1 percent and 19.7, respectively. The study found that not only do adverse events harm the patients, but also providers. Average length of stay for a patient with no adverse event was 8.8 days, compared to those who did experience adverse events who had an average length of stay of 23.8 days, while those with serious adverse events had a 32 day long average length of stay. Nationally, the average length of stay postoperatively is 4.6 days, which costs about 2,000 dollars (AHRQ, 2011). Based on this data, it is clear that adverse events led to a significant increase in not only average length of stay, but costs accrued by the hospital system studied.

However, the limitations of this study should not go unmentioned. Compared to an average length of stay of 4.6 days nationally, the 8.8 day stay presented in this study showed that either the sickest patients from surgical units were chosen or that the hospital selected admitted the sickest types of patients. However, this should have no effect on the incidence of errors. The reporting of this prospective study showed substantially higher rates of errors reported by other retrospective studies, 45.8 percent and 10 percent, respectively.

Additional prospective studies have obtained results that were similar to what Krizek (2000) achieved. Bosma, Veen and Roukema (2011) analyzed the incidence of surgical errors. As with the

study conducted by Krizek, a prospective design was used and provided an opportunity for quality improvement in patient care. They aimed to analyze the incidence, nature, severity and consequences of medical errors.

Bosma, Veen and Roukema defined an error as "a condition or event, unfavorable to the patient's health, causing irreversible damage or requiring a change in therapeutic policy." Furthermore, they classified the severity of complications on a validated four point grading system. The most severe complication resulted in death, then lasting disability, then need for pharmacological or additional medical treatment, and finally minimal harm incurred, grades IV, III, II, and I, respectively.

During the study period of two and a half years, 12,121 patients were admitted to surgical units, with 66 percent being elective and 34 percent being acute. A total of 15,058 surgical procedures were performed on 8384 patients (some patients had multiple procedures). One thousand six hundred thirty-nine patients (19.5 percent) had one or more adverse event occurrence, whereas, 394 of the 3737 patients who were not operated on had adverse events (10.5 percent). Incidence of error was highest in thoracic, vascular and trauma surgery, 9.9, 9.2, and 8.7 percent, respectively. Of all the errors, 94.7 percent had no lasting effect on the patient, although additional intervention, follow-up procedures, and average length of stay all suffered significant increases. These resulted in an increased average length of stay for the patient and of cost to the provider (Bosma, Veen, & Roukema, 2011).

Bosma, Veen, & Roukema showed that errors in surgery are a common problem and – according to their study – accounted for six percent of all admissions. Although most events occurred without long-term harm to the patient, one of every twenty patients had significant consequences resulting in their death or permanent injury. Although prospective data reporting might be of great

importance to patient safety, it is rarely undertaken (2011).

Limitations exist in all studies and the two mentioned above are no different. The biggest problem when analyzing surgical errors is the potentiality of underreporting and missing incidents of surgical errors. Consequently, the figures presented in both studies may be grossly underestimated. Underreporting is especially true when residents are the ones to register complications, which occurred in both studies (Bosma, Veen & Roukema, 2011; Krizek, 2000). Additionally, the Hawthorne effect can tend to improve outcomes since the surgeons knew they were being evaluated. Finally, when compared to retrospective data of the same nature, prospective data studies presented a much smaller sample size. However, Bosma, Veen & Roukema (2011) and Krizek (2000) laud the prospective data collection, which can provide an outstanding opportunity for prevention and quality improvement by actively reviewing charts and records, which can potentially reduce the incidence of errors with any identified consequences to the patient.

Patient safety is not all that is at risk with surgical errors. Although providers should always have patient safety goals in mind, monetary incentives should not go unmentioned. The attributed cost of the 44,000 – 98,000 people that die from medical errors each year is $17 – $29 billion. These costs are mostly attributed to increases in average length of stay, follow-up visits and surgeries and lawsuits. Of this, according to a study funded by the AHRQ, surgical adverse events accrued an annual cost of nearly 1.5 billion dollars when generalized to the nation. Costs of errors continue to accrue even after the patient has been discharged (Encinosa & Hellinger, 2008); these numbers can again be underestimated due to underreporting of the adverse events that occur.

Surgical errors are also connected with social cost prompted by the damage produced.

Goodman et al., reports that the value of lives lost and disabilities prompted by surgical errors in 2006 ranged from 393 to 958 billion dollars, which is equivalent to 18-45 percent of the total United States health care spending (2011). Thus, lowering costs of errors can potentially reduce United States health care costs. Additionally, the study attests that the chance of a patient dying from a cause other than the one he or she was hospitalized for is one in two hundred and that adverse events occur in every one of twenty admissions that lead to surgery (Goodman et al., 2011).

Now we have established that adverse events in the perioperative setting are a serious public health concern. These errors not only cause adverse events in patients, but are also related to health care cost and increased length of stay. Although billions of health care dollars have been invested in improving quality, surgery continues to include not only risk but also possibility of an adverse event occurring. It is important to understand the impediments and challenges that have prevented the rates of surgical errors dropping since the IOM published "*To Err Is Human*".

The World Health Organization (2008) and Krizek (2000) identified six clinical barriers in surgery that might have inhibited improvement in quality as was expected: Inadequate data about incidence of adverse events, inadequate practice guidelines, a culture of blame, difficulty in truth telling, a need to compensate injured patients, and the complexity of the surgical setting.

Inadequate data reporting has led physicians to believe that the problem is not as prevalent as portrayed. Due to data extrapolations - as with To Err is Human where data from two states were extrapolated nationwide-, inaccurate audits and medical records occasionally being incomplete, physicians often disregard data on surgical errors. Additionally, a provider will on average only be responsible for one preventable death every twelve years – hardly a cause for alarm in a field where

death is common. Thus, physicians will often be unaware of the potential harm they have caused in the grand scene of their practice (Mechanic et al., 2005).

A surgeon's training and the hospital's culture can often cause inadequate practice guidelines. Oftentimes a providers training in residency will not be updated frequently enough to keep up with evidence-based practice, and even more shockingly, occasionally hospitals will take too long to disseminate and upgrade order sets to reflect the newest best practices. It is inexcusable to disregard evidence-based medicine. A provider's job is to remain up to date on current practice guidelines. A surgeon not adhering to current accepted practice guidelines is doomed to cause adverse events (Krizek, 2000).

The field of medicine is famous for its culture of finger pointing. For example, if an error occurs intraoperatively the surgeon will blame anesthesiologist who will blame the medical doctor will who blame the surgeon. It is due to this culture that providers will sometimes hide minor adverse events to protect themselves from blame. This often leads to worse outcomes for the patient and costly investigations. Although many hospitals are encouraging a non-punitive environment for reporting errors, most clinicians will still opt out (Mechanic et al., 2005). This culture of blame is directly related to the two other barriers, truth telling and compensation to an injured patient. Surgeons will sometimes not disclose errors to patients and their families if they are not life threatening for fear of litigation (Mavroudis 2005; Krizek, 2000).

The sixth barrier in improving surgical safety is its complexity. Even the most seemingly simple and straightforward procedures require dozens of steps and checklists. Each of these steps allows an opportunity for failure and the possibility of an error occurring. From identifying the correct site on the

correct patient to sterilizing surgical equipment, each step is infinitely important and must be completed flawlessly to prevent an adverse event from occurring (Gawande, 2012). Ultimately, a surgical team that works effectively will produce the best outcomes. Unfortunately, surgical teams often have little understanding of how to better promote efficient collaboration, a skill that reflects on improved patient outcomes (WHO, 2008).

In additional to the clinical barriers, progress in reducing surgical errors has been slow for political reasons. Given the enormity of the problem – thousands of preventable deaths and millions of preventable injuries – and the evidence-based knowledge of how to lessen them, it is anticipated that this would have to be a large national effort. Due to the fact that the United States lacks a health care governing organization, the campaign is being spearheaded by organizations such as The Joint Commission. Unfortunately, AHRQ funding is often scarce and action plans seldom get fully carried out (Leape, 2000). Furthermore, the edginess that was association with the publishing of *"To Err Is Human"* has subsided. In fact, when the public was polled just three years after the report was published, sixty percent thought that the number of preventable deaths was less than five thousand (Mechanic et al., 2005). Loss of public demand, lack of funding and little public support for expanding governmental regulations have all contributed to the decelerated progress of surgical patient safety.

An often overlooked barrier when trying to bring about policy change is monetary insufficiency. Due to the fact that no governmental health care organization exists in the United States, funds are lacking in our health care system. Without governmental funding, hospitals and practitioners are unlikely to adopt any system or policy that leads to a net cost. Regrettably, federal funding does not guarantee results either (Mechanic et al., 2005).

Shojania and Thomas offer two opinions on why progress in the surgical safety arena has been so slow. First, investments into patient safety pale in comparison to the billions invested in biomedical research. The National Institutes of Health (NIH) has an annual budget of nearly 30 billion dollars, roughly sixty times that of the AHRQ (AHRQ, 2013). The "war on cancer" announced in 1971 by Richard Nixon has consumed hundreds of billions of dollars. The United States National Cancer Institute alone spent 105 billion dollars. while other funding and philanthropic agencies have spent countless billions more. While the United States can boast of some amazing outcomes, over all the mortality rate of cancer has only dropped five percent since 1950 (Shojania & Thomas, 2013). This miniscule impact has occurred over a significantly longer time period than the patient safety initiatives have even existed. Additionally, cancer and biomedical research had a significant clinical head start as well. Existing clinical and biological research was used as a springboard to launch new research and clinical trials, something that is sorely lacking in patient safety research (Shojania and Thomas, 2013).

Secondly, for progress in patient safety to occur, Shojania andThomas believe that three achievements need to occur: Identification of interventions that reduce common adverse events, effective dissemination of effective interventions, and development of a tool to measure improvements in patient safety problems. Sadly, none have transpired. Very few effective and evidence based interventions exist and those that exist have not been widely adopted. Additionally, they believe that even if we were to make progress in surgical safety, the current "gold standard" instrument for measuring progress – as used in the Harvard Medical Practice Study of New York Hospitals and Atul Gawande's study of hospitals in Utah and Colorado (Brennam et al, 1991; Gawande et al., 1999) – are too blunt to measure slow progress over time.

Unfortunately, even if the former barriers were not present and patient safety was a top national priority, progress would still be sluggish. Unlike establishing new clinical guidelines, such as best practices of care, patient safety reform needs to begin with the provider and the executive leadership of the health care organization and then disseminate through all levels of the field. It requires innovation in all aspects of medicine: professional, personal, organizational and societal (Leape, 2005). Safety should not just be an organizational priority; it should be the only priority interwoven in all aspects of practice and understanding (Mechanic et al, 2005). Health care organizations should not simply respond to accidents, but should be proactive against hazards. High Reliability Organizations (HROs) such as those in the aviation and nuclear power industry have successfully implemented this culture into their daily routines. These organizations actively seek out weak links in the chain and repair them before any adverse events occur. They work in highly regulated, functional and supportive teams. Modern health care organizations – unlike HROs – are highly complex and highly dysfunctional. Hospitals tend to approach the problem of error with the intent of saving their reputations rather than dealing with the issue. They would prefer to fix the immediate problem, instead of fixing the underlying issues that caused it. Finally, since most physicians consider themselves per-diem contractors, it is difficult for instill in them a sense of responsibility and overall logistic consistency Mechanic et al, 2005).

It comes as no surprise that a field as highly complex and intricate as medicine and –even more so – surgery is the host to many barriers preventing improvement. Fortunately, organizations and individuals stood up to the challenge to attempt to reduce errors in the perioperative setting. The two spearheads of this campaign have been The Joint Commission (TJC), which established The Universal Protocol and the WHO, which created the Surgical Safety Checklist and launched educational

campaigns to meet the global need to make surgery safer (The Joint Commission, 2006; WHO, 2006).

The Joint Commission led the campaign to reduce surgical errors, beginning in 1998 when the organization disseminated the first Sentinel Event Alert newsletter on the topic. A follow-up alert was issued in 2001. Finally, on May 9th, 2003 TJC hosted the Wrong Site Surgery Summit. The meeting's specific goal was to develop and obtain consensus for preventing surgical errors, specifically wrong-side, wrong-procedure and wrong-person operations The summit was hosted by TJC in collaboration with the American Medical Association, American College of Physicians, American College of Surgeons, American Dental Association and a plethora of other governing and regulatory professional organizations (The Joint Commission, 2005). Summit participants agreed that a universal protocol would help to alleviate the incidence of surgical errors and adverse events. The participants agreed that the protocol should be specific to eliminate confusion, yet flexible to accommodate unique surgical situations (The Joint Commission, 2005).

In addition to the summit, TJC pursued broad consensus on the initial drafts of the Universal Protocol to make it more valuable and useful to the majority of surgical situations and surgeons (The Joint Commission, 2005). Their work elicited nearly 3,000 responses from surgeons, nurses and other healthcare professionals. The public comments led to refinements in the original protocol. Shortly after publication in 2005, over 50 professional organizations and associations endorsed the Universal Protocol (The Joint Commission, 2005). Finally, in July 2003 The Joint Commission Board of Commissioners approved the Universal Protocol for Preventing Wrong-Site, Wrong-Procedure and Wrong-Person Surgery. On July 1st, 2004 it became effective for all accredited hospitals, ambulatory care facilities and office-based surgery facilities. Before discussing what the Universal Protocol

mandates, it is imperative to note that Joint Commission participation is voluntary for hospitals and clinics. Due to this, TJC cannot mandate compliance from non-participating hospitals and clinics.

The three crucial components of the Universal Protocol mandate that the operating room team must: complete a preoperative verification process, mark the operating site, and perform a "time out" immediately prior to incision. This process confirms that the appropriate patient has consented and is present for the procedure. Either nursing or anesthesia can perform the patient identification process; however, one stakeholder must be with the patient until he or she enters the operating room. Also, the surgeon must mark and initial the site of incision before the patient enters the operating room. Once the patient is inside, the marked site must remain visible during draping and must be indicated during the "time out". The "time out" is then preformed; it is a team process lead by the surgeon and monitored by the other stakeholders. It is performed just before incision and all activity must be stopped until the time out is completed. It must consist of three questions: Who is this patient? What procedure is being performed? And is this the correct site of mark to perform incision? Most facilities go beyond the essential three questions and have even established hard-stops to prevent early incision (Gibbs, 2012). A hard-stop is an essential protocol which does not allow the patient to be moved from his bed unless the nurse confirms that all protocol has been followed.

While the Universal Protocol is comprehensive and mandated only in all Joint Commission accredited institutions, its effectiveness and implementation varied across facilities (Michaels et al., 2007). This became clear when results of a project within 8 hospitals determined that even after full compliance with the Universal Protocol, wrong-site surgeries occurred as many as 40

times per week (Crane, 2011; Joint Commission Center for Transforming Healthcare, 2011). Even more

frighteningly, these numbers only account for TJC accredited hospitals, meaning that they are grossly underestimated. It is clear that healthcare organizations need more than just policies and processes to implement; they also require guidance on how to successfully make these processes and policies work (Gibbs, 2012).

Utilizing the basic concepts of TJC, the WHO created their own list of criteria intended to increase safety and reduce errors in the perioperative setting. At the initial consultation in 2007, complications of improving surgical safety were recognized and reviewed. The WHO recognized the complexity of the modern operating room and formulated 10 essential, but basic, objectives that are flexible enough to accommodate all surgical cases. The WHO identified four areas of possible improvement: 1) safer surgical teams by improving communication between team members, 2) safer anesthesia by improving patient monitoring, 3) surgical site infection prevention with antisepsis and contamination control, and 4) measurement of surgical services to measure basic outcomes of surgical care. Furthermore, it was guided by three principles: 1) simplicity since exhaustive lists will lead to protocol fatigue, 2) wide applicability since the field of surgery is infinitely diverse, and 3) measurability since the measurement of impact is key. The WHO believed that if these three principles are followed the goal of safer surgery would be feasible.

From 2007-2008, the WHOs Safe Surgery Saves Lives Challenge went into effect in 8 hospitals across the globe as a pilot study. Baseline data was collected from 3733 consecutive patients over the age of 16 who underwent non-cardiac surgery; subsequently, data from 3955 patients was collected consecutively after the implementation of the WHOs Safe Surgery Saves Lives program. Patients were monitored for any complications that occurred within 30 days postoperatively. Complications were

defined as they are by the American College of Surgeons, ranging from acute renal failure, to bleeding requiring 4 or more units of blood within 72 hours postoperatively, to cardiac arrest. The results obtained were quite remarkable. All complication rates dropped from 11.0% at baseline to 7.0% after the WHO Surgical Checklist was introduced ($P<0.001$); the hospital death-rate dropped from 1.5% to 0.8% ($P=0.003$), and the overall surgical site infection ($P<0.001$) and unplanned reoperation rates ($P=0.047$) dropped significantly as well (Haynes et al., 2009).

Although implementation of the WHO's Surgical Safety Checklist had led to statistically significant improvements in surgical patient outcomes, the mechanism of this type of dramatic improvement is unclear (Haynes et al., 2009). Implementation of the checklist and its related interventions required systematic changes at several medical centers and these changes could have easily resulted in the same outcomes. For example, improvements in airway evaluation could have been the result of improved anesthesia care. Additionally, the Hawthorne effect could have played a role during the time of study. Haynes et al., admit that it is difficult to disentangle the Hawthorne effect from this study since peers orally perform the checklist. However, their analysis shows that the presence of study staff in the operating room did not change frequency of complications (Haynes et al., 2009).

The significant improvements in patient outcomes found by Haynes et al. can be attributed to proper implementation, understanding and enthusiasm. Although subsequent studies showed improvements in patient outcomes with the implementation of the checklist, none were as notable as the original study. For example, Van Klei et al., (2012) retrospectively looked at 25,513 patient records at a single institution after the implementation of the WHO surgical checklist, thus removing observer

bias. Crude mortality dropped from 3.13% to 2.85%. This effect was strongly correlated with checklist compliance (Van Klei et a., 2012).

Regrettably, not all studies of surgical safety obtained the same positive outcomes as Haynes et al. (2009) and Van Klei et al., (2012) did. A study of the implementation of WHO's Surgical Safety Checklist in Norway lead to little change in hospital safety culture. Although patient outcomes were not studied, Haugen et al. looked at pre- and post-intervention surveys that were distributed to clinicians and ancillary staff; the outcome studied was the effects of the WHO checklist on surgical safety culture perceptions by the clinical staff. Response rate to the survey was 61% at baseline and 51% post-intervention. Unfortunately, the authors determined that the WHO surgical safety checklist had limited impact on safety culture ($P < 0.05$) (Haugen et al., 2013). Conversely, Low et al. (2012) received a 71% response rate and found that surgical teams valued the WHO's Checklist and thought that it contributed to patient safety. In fact, staff even insisted that the Checklist be completed in its entirety (Low et al., 2012).

The large spectrum in the effectiveness of WHOs Surgical Safety Checklist can most readily be attributed to large discrepancies in implementation. Implementing and mandating compliance without proper enthusiasm will simply lead providers to reject it. Oftentimes, safety process measures appear so duplicative to surgeons that they merely "go through the motions" without a vested interest or belief in what they are doing, hoping that someone will catch an error somewhere down the line. Thus, it takes more than a simple mandate to go beyond "passing a test". The goal all healthcare organizations should be striving for is patient safety. So, active leadership, deliberate enrollment, extensive discussion, training, piloting and ongoing feedback should all be part of checklist

implementation (Conley et al., 2011).

Despite demonstrating such improved outcomes in the pilot study, realistically, the WHO Surgical Safety Checklist's real world impact will vary greatly based on implementation (Conley et al., 2011). Health care organizations should make systematic efforts to explain why the checklist is being implemented and how it works. Additionally, proper extensive education regarding its proper use will result in better buy-in from the surgical staff. This will, ultimately, lead to improved compliance and improved outcomes as portrayed by the Haynes et al. (2009) surgical checklist pilot study (Conley et al., 2011; Lyons, 2013).

Due to the fact that a lot of surgical safety revolves around proper communication of the surgical staff, it is valuable to discuss a project to improve communication in the health care setting. The AHRQ and the Department of Defense (DoD) embarked on a patient safety initiative that revolves around communication in the medical setting. TeamSTEPPS is a systematic approach to integrating teamwork into practice. Using catchy jargon and real world situations TeamSTEPPS – when effectively implemented - demonstrates improvements in communication and interactions (Clancy, 2007). It is estimated that 70 percent of all medical errors are the result of miscommunication or improper interaction (Studdert et al., 2002). Optimistically, studies have shown that TeamSTEPPS helps to instill the confidence to speak out if a team member realizes something has gone awry. Additionally, TeamSTEPPS trained groups demonstrated significant increases in the quantity and quality of pre-surgical procedure briefings and the use of quality teamwork behaviors during case (Weaver et al., 2010)

When properly disseminated within a surgical setting, TeamSTEPPS helps to alleviate some of

the silos that plague surgical personnel. Fortunately, implementation across an organization is fairly simple to accomplish. The issue lies in sustainability. The ultimate goal of this program is to lead to cultural change. However, culture change is difficult to accomplish. It is due to this that the DOD and AHRQ recommend that a powerful group must lead the change, and members of that group must work together as a team – setting the example – to bring about change within the organization (Ferguson, 2008).

The final intervention strategy that was – and still is – being implemented is the EMR (electronic medical records). Although it is widely believed that the adoption of EMR systems will lead to reduced costs long-term, reduced medical errors and improved quality, only about 35% of acute care hospitals had adopted the EMR systems by 2008 (Hillestad et al., 2005; Radley et al., 2013). The main reason for late adoption of the EMR system in hospitals across the nation is cost. Between implementation, maintenance and education, cost of the EMR system can be well over a million dollars for individual hospitals and thousands for private clinics (Kazley, 2007). As with any investment, the cost of implementation needs to be weighed against the benefit of having the product. The main reason for adopting EMR system is to improve quality, efficiency and cost of medical care (Chaudhry et al., 2006). For the purpose of this paper, focus will be prioritized on quality.

Given the fragmented nature of health care in the United States, the immense size of transactions within the system, the need to integrate new evidence based practices and the complex style of information being exchanged, the limitations of paper-based medical records is quickly apparently (Chaudhry et al., 2006). It is theorized that hospital EMR use may reduce errors by reducing poorly handwritten patient charts, physician orders, diagnoses, and provider notes. Additionally,

medical records can be programmed to act as a safety net capturing adverse drug interactions and overdoses, which can reduce unnecessary testing and treatment. Although not all EMR systems are programmed to capture all these variables, most offer some possibility of reducing harm to the patient (Chaudhry et al., 2006). In fact, the IOM called for an "elimination of most hand written clinical data by the end of the decade in their 2001 report *Crossing the Quality Chasm: A New Health System for the 21st Century*.

Although currently there is no literature on the effect of EMR on the rate of surgical errors, a plethora of publications exist on medication errors. These are important in all aspects of surgical care since a medication error can lead to drug interaction during surgery. Medication errors in hospitals are common, expensive and harmful to patients. Errors range from too much vitamin C, which is benign, to too much acetaminophen, which can lead to liver failure and death (Radley et al., 2013). Radley et al. conducted a literature review to estimate the effects of EMR on medication errors (2013). The results obtained were significant. Processing a drug order through en EMR system reduced the likelihood of an error by 48% ($P < 0.05$). Given the rate of EMR adoption and implementation in 2008, their findings suggest that medication errors – and in turn, medical and surgical errors – were reduced by 12.5%, which equates to roughly 17.4 million fewer medication errors over a one-year period. They attest that if all US hospitals adopted EMR systems, as many as 51 million medication errors per year could be avoided (Radley et al., 2013). On the fiscal end of the spectrum, Hillestad et al. believes that with 90 percent adoption inpatient and outpatient savings can total more than 77 billion dollar annually.

The projected reduction in errors found by Radley et al. represents an important indicator of the potential rewards of hospitals using electronic medical record systems. Even though the rate of

medication errors had significantly dropped, it was unclear – according to Radley et al – if this reduction led to improved patient outcomes (2013). Although it is unclear whether or not this would translate into the complex field of surgery, it is important to note that an improvement in process measures does not always lead to an improvement in outcome measures (Finney et al., 2011).

The success of the interventional strategies on surgical safety described above range from insignificant to major in semi-controlled environments, studies and hospitals. However, real world application contains greater variably and is less controlled than studies. Such discrepancies arise because researchers and facilities often ignore the interwoven relationships between process measures and outcomes measures (Finney et al., 2011). For example, policy makers and health organizations might assume that if an intervention for a particular problem results in improvement in a particular study or hospital, this improvement can translate to improvement at any facility.

A field as complex and multifaceted as surgery requires interventional policies to be succinct, evidence-based, and useful. Bureaucratic policies with no evidence will receive poor compliance from physicians and hospitals. Surgeons, when confronted by a constant barrage of new protocols, policies and regulations will comply poorly out of protocol fatigue. The reality is that nearly a decade and a half after the IOM report "*To Err is Human,*" the system has failed to make medicine safer (Safe Patient Project, 2009). This means that in the past fourteen years, nearly 1.4 million lives were unnecessarily lost and billions of research dollars wasted. New research is paving the way for new interventions (Bates and Gawade, 2000). The next painfully difficult task will be to measure the effects and implement effective evidence-based policies that will appeal to both providers and patients. With the

Patient Protection and Affordable Care Act on the near it is the perfect time to act, change, and bring medicine and surgery into the 21st century, as neither patients nor providers can wait another decade and be met with failure (Patient Safety Project, 2009; Bates and Gawande, 2000).

Discussion:

The 1999 report by the Institute of Medicine (IOM). titled *"To Err is Human: Building a Safer Health Care System."* placed the issue of patient safety high on the national health care agenda. The findings that 44,000 to 98,000 people die from preventable medical errors each year incited considerable clinical, political and national concern. Independent of the fact that these preventable errors result in $17 to $29 billion health care dollars spend, the main point of interest was that – even at the most modest level – medical errors are a leading cause of the death in the United States. Regardless of claims of whether the data used by the IOM is overestimated (Sox and Woloshin, 2001) or underestimated (Krizek, 2000), the reality is that a large number of people die from preventable medical and surgical errors. Although the accuracy of the IOM report is highly debated, there is widespread agreement that errors pose a serious risk to the health of patients.

Information regarding surgical errors and complications depends mostly on retrospective analyses or self-reporting by hospitals. Although this is a debated method of analysis, it represents the best information available in the field today (Krizek, 2000; Sox Woloshin, 2001). One of the most highly quoted and regarded studies was conducted by Harvard Medical School in 1991. Brennan et al. used stringent criteria to retrospectively review over thirty thousand medical records(1991). They found that adverse events occurred in 3.7 percent of patients (1133) and 48% (544) of these adverse events were surgical (1991). This study was used by the IOM to estimate that surgically adverse events due to medical management can potentially range from 21,120 to 47,040 when extrapolated for the United States. One year later, Atul Gawande of Harvard followed up with a more in-depth study of surgical adverse events. A review of nearly 15,000 discharged patient charts identified an adverse event rate of

three percent –consistent with the findings of Brennan et al.

Since retrospective studies pose limitations on reporting, studies have been conducted in a prospective manner as well. Krizek (2000) and Bosma, Veen and Roukema (2011) analyzed the incidence of errors prospectively, 21.2 percent and 19.5 of adverse events or errors were identified and surgery was the cause of 7.5 percent and 6 percent, respectively.

To combat the effects of lapses in surgical patient safety in the United States health care system, the Joint Commission (TJC), The WHO, National Quality Forum (NQF) and Agency for Health Care Research and Quality (AHRQ) decided it was time to intervene. Three interventions have been identified in this paper: The Universal Protocol, The Surgical Safety Checklist and EMR implementation.

Leading the campaign against surgical errors the Joint Commission convened and approved a groundbreaking protocol in 2004. The Universal Protocol mandated that the operating room team must: 1) complete a preoperative verification process, 2) mark the operating site, and 3) perform a "time out" immediately prior to incision (The Joint Commission, 2005). Although TJC mandated compliance in all their hospitals, individual success of implementation varied. This lack of success became clear when even with 100% Universal Protocol compliance, wrong-site, wrong-procedure, wrong-patient surgeries occurred as many as 40 times per week in the United States (Crane, 2011; Joint Commission Center for Transforming Healthcare, 2011).

Following TJC, The WHO created basic objectives that were flexible enough to meet all surgical cases. These objectives were focused on simplicity, applicability, and measurability. The WHO believed that if these three principles are followed, the goal of safer surgery could be attained. From 2007-2008, the WHO's Safe Surgery Saves Lives Challenge went into effect in 8 hospitals across the globe as a pilot

study. The results obtained were remarkable; complication rates dropped from 11.0% at baseline to 7.0% after the WHO Surgical Checklist was introduced and mortality dropped from 1.5% to 0.8% in the 8 hospitals (Haynes et al., 2009). Although subsequent studies showed improvements after implementation, none were as notable as the original study by Haynes et al (2009).

The final intervention was electronic medical record (EMR) implementation. Even though it is believed that EMR adoption will lead to reduced costs long-term, reduced medical errors and improved quality, only about 35% of acute care hospitals had adopted the EMR systems by 2008 (Hillestad et al., 2005; Radley et al., 2013). The biggest reason for this lack of universal adoption is cost-, as EMR systems can cost well over 1 million dollars for hospitals and tens of thousands for private clinics (Kazley, 2007). Unfortunately, even with full implementation that led to a reduction in errors, it is unclear if EMR implementation led to improved outcomes in patients (Radley et al., 2013).

Because widely disseminated public knowledge regarding surgical errors is only fourteen years old it is limited when compared to other fields of research. Thus, the literature presented has many weaknesses but also certain strengths. Beyond that fact that many providers believe that the data provided by the IOM is overestimated due to extrapolation of a study to the nation, other issues exist in the current literature as well.

Since no universal error reporting system exists in the United States, there is little incentive for hospitals to report errors unless mandated. This lack of reporting leads potential case studies and learning opportunities to be missed. Furthermore, root cause analyses within hospitals might not occur if they are not mandated by agencies such as TJC or Center for Medicare and Medicaid (CMS).

Another weakness is the fact that most information regarding errors comes from retrospective

chart review. Traditionally, there has been reluctance to document errors in official medical records for fear of litigation. This leads to missing pertinent data for research purposes and to an underestimation of the actual problem. Prospective study review is not without faults as well. As with retrospective studies, documentation by residents in prospective studies can lead to omissions of events since residents are not always competent enough to document properly. Additionally, the Hawthorne effect comes into play. Staff might work better under observation, which can lead to less errors and improved outcomes. Finally, prospective studies offer much smaller sample sizes than retrospective ones, which might not lead to statistically significant results. These issues are the reason why there is such a wide discrepancy between the results of retrospective and prospective studies regarding surgical errors and adverse events – 3 percent to 7.5 percent at the largest points.

The final weakness is the relevance of the results that are currently available. The most quoted study presents chart reviews from 1984, which might not be applicable to the current health care and hospital situation in the United States. The field of medicine and surgery evolves swiftly and providers often disregard results from 1984 published in 1991. This, in turn, leads to a lack of knowledge regarding interventions attempted to reduce surgical errors. It is impossible to fully comprehend the effects of interventions by the WHO and TJC without large-scale studies, which the literature currently lacks.

Even though there are significant limitations to the literature, it does present several strengths. First, the massive sample size found in retrospective reviews provides a strong starting point to dictate further research. The problem of errors and adverse events in the perioperative setting is clearly understood and the reliability is fairly stable throughout the various studies performed. Both

retrospective studies obtained results in the 3% range and both prospective studies obtained results within the 20% range.

Nearly all health care organizations – hospitals, policy makers and leadership – have all become aware of the problem of surgical errors and adverse events. The support of these organizations has helped to form a plethora of agencies such as TJC, AHRQ, NQF and various others whose main purpose is to alleviate this problem of surgical errors. Thus far, success has been minimal but measurable. Checklists, protocols and safety nets have been able to capture a multitude of problems that arise in the complex operating room. Although studies conducted do show improvements in surgical patient safety, it is not possible to quantify the number of errors today and therefore it is impossible to conclude if the goals of the IOM have been met since the literature does not exist.

The demand for more literature should begin now. Retrospective data from thirty years ago cannot be applicable in today's modern operating room. Additionally, even if the operating room culture and complexity has not changed it behooves researchers to better understand the effects that the Universal Protocol and the Surgical Safety Checklist has had on errors and adverse events. Policies are only effective if they are proven to be effective. Since process measures do not always translate to outcomes measure it is important to know if funding and investments need to continue or be halted for the current programs in place. The only way to accomplish this is with more research. Both retrospective and prospective studies should be conducted. Retrospective studies should use the criteria utilized by Brennan et al. (1991) to be able to compare the results of the current incidence after the implementation of the various interventions attempted. Prospective studies should begin immediately and utilize large enough sample sizes to obtain statistically significant results. Additionally,

a distinction needs to be made between surgical errors and medical errors. Although a large body of literature exists on medical errors, literature on surgical errors and adverse events is lacking. Since 48% of all errors occur in the perioperative setting, it behooves researchers to separate the two drastically different fields of medicine.

As with any field, in order for significant changes to occur in the field of surgical patient safety, certain policies need to be adopted. Adverse events and errors are often based on poor adoption, implementation and research of current policies and regulations. These policies should focus on providers, organizations and patients alike, as a multidirectional approach might prove to be more effective. The following 5 policy recommendations are a few ideas that might accomplish the goal of improved surgical patient safety: 1) develop a national entity to track progress 2) universally mandate error reporting and disclosure 3) improve error reducing technology 4) train providers in teams 5) improve patient responsibility.

First, fourteen years after *To Err is Human*, the United States still has no national entity to track progress. The closest the United States has come is the development of the AHRQ. Unfortunately, the AHRQ is a comprehensive organization that is not able to collect data nationally. It merely approximates national progress on surgical safety through claims data provided on patients in the Medicare and Medicaid systems, hospital billing data and other resources like vital statistics and census data (Safe Patient Project, 2009). An additional limitation of the AHRQ is that it does not disclose provider or facility specific information. The data is provided on a national or state aggregate. Thus, prospective patients, policy analysts and researchers cannot differentiate between high error and low error hospitals. Furthermore,

the data is not current. The ever evolving area of surgery requires information to be as current as possible; the AHRQ is often three to four years behind in its~~their~~ reports (Safe Patient Project, 2009). These delays are a chronic problem in health care data and often results in a reduction of relevance of the report as a learning mechanism. Stale data might not be applicable to current practices inside the modern complex operating room. The AHRQ is aware of the problem and in a 2008 report states that "data remain incomplete for a comprehensive national assessment of patient safety." (AHRQ, 2008). This claim is an unfortunate indicator of how little advancement in data collection of surgery safety has occurred.

In 1999, the Institute of Medicine recommended tracking national progress with quarterly surveys such as the ones conducted for the IOM's *To Err is Human* estimate. It behooves researchers to use medical technological ~~advanced~~ to make this task simpler. Electronic medical records can be accessed remotely and provide researchers and policy makers with applicable and up-to-date data on surgical patient safety. Unfortunately – nearly a decade and a half after the IOM report – a comprehensive national tracking system does not exist and it is difficult to tell if significant progress towards patient safety has occurred.

Second, the surgical error reporting system in the United States is cumbersome and confusing. The different requirements for reporting errors and adverse events by CMS and TJC can lead events to fall through the cracks. In addition, patients cannot know which health care organizations provide subpar data on errors. No single nationally mandated reporting system exists. Since 1999 error reporting has primarily consisted of voluntary, confidential and aggregate systems mandated by CMS. In fact, laws in seventeen states prohibit release of

medical harm data to protect hospitals (Patient Safety Project, 2009). Other organizations such as TJC and NQF only mandate reporting from private membership hospitals and their required list of adverse events is not exhaustive.

Mandated error and adverse event reporting will signify a huge change in a system known for opting to hide errors. While the current error reporting systems fail to create an atmosphere of pressure for change, a m~~. M~~andated reporting system can hold all of the United States health care organizations to the same level of accountability. Discrepancies should not exist between states, just as lapses in patient safety should not. A national entity should exist that will require all health care organization to publically report adverse events that occur in their facilities.

Third, the current medical technology is ever-improving; ~~,~~ funding should be provided for better equipment. Improvements in electronic medical records, diagnostic tests and safety net technology can have a two-fold effect on error reduction. First, improvements in EMRs can provide up-to-date data for research. As recommended above, it is much easier to remotely review patient data for errors. Current literature is several years behind and this lag reduces its relevance. EMR systems can allow researchers to quarterly review data on national progress and provide policy makers and health care organizations with the latest data available. Second, improvements in diagnostic tests and safety net technology can catch errors before they occur. Providers are human and will make errors; however, improved software and technology can trigger alerts that will advise providers of errors before they occur. For example, software can advise anesthesiologists of possible drug interaction as the time of intubation and safety net

technology can prevent wrong patient surgery by using thumb print confirmation of the patient.

Fourth, as described above, many errors and adverse events occur because of~~y~~ breakdowns in communication. Discrepancies often occur between different teams of clinicians. Oftentimes physicians, physician assistants, nurses and patient care techs will fail to communicate or understand each other sufficiently. ~~often experience breakdowns in understanding~~ (Leape and Berwick, 2005). Team training can better prepare teams for adverse events that can occur. Simulation training has continuously shown breakdowns in communication between physicians and nurses (Leape and Berwick, 2005). Training future physicians, nurses and ancillary clinical staff from school to residency can help to alleviate these breakdowns. Better communication has been shown to reduce errors and improve employee satisfaction as shown by the TeamSTEPPS project described above.

Finally, the patient must be proactive. Patients should be proactively involved in their care. They should ask pertinent questions of their providers, such as inquiring about his infection rates, surgeries completed this year, and his outcomes. Since the patient is the only individual present throughout every aspect of his or her~~their~~ care, he or she is ~~they are~~ the most valuable resource available to providers. The patient is~~y are~~ the final safety net that can prevent wrong-site, wrong-patient and wrong-procedure adverse events. Patients should not just be able to speak up, but take an active role in their care. This can reduce their risk of harm and improve their chances of positive outcomes from their hospitalization. Additionally, many errors and adverse events occur in the operating room before anesthesia induction. For example, allergic reactions to medications or hand hygiene have a high chance of being observed by the patients. Thus, it is pertinent that funding and research becomes available to educate the patient. Providing complete information and education to

the patient will not only result in reduced errors and better outcomes but also reduction in lawsuits that can be caused by adverse events.

Conclusion:

It has been nearly a decade and a half after the Institute of Medicine described that anywhere between 44,000 and 98,000 people die from preventable medical errors annually in the United States. Despite millions of dollars invested, an abundance of interventions attempted and fourteen years of continuous work, researchers are still unsure whether there have been significant improvements in surgical patient safety. There is nearly no reliable evidence that surgery is any safer than it was a decade and a half ago. Whether due to better reporting, outdated reports, or better surgical error reporting it is unknown whether medical and surgical errors are the 6th leading cause of death of Americans.

The uproar of To Err is Human has subsided and although countless editorials, organizations, policies and task forces have been organized and written, key recommendations for the future remain sluggish. Patients, health care leaders, providers, policymakers and all stakeholders in patient safety need to work together to accomplish this goal of making surgery safety in the United States. Acting now will prevent the same question being asked in another decade and a half: is surgery safer?

Physical Activity of Brooklyn Older Adults: Measuring self-reported daily activity logs using the Compendium of Physical Activity

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ABSTRACT

Intro: Physical activity (PA) is recognized as an important determinant of health. While the older adult population represents the fastest growing age group in the United States, it is the least active, with the majority of the population leading a sedentary lifestyle. Research focused on PA in older adults is sparse. The purpose of this study was to characterize the activities of urban older adults and the associated metabolic expenditures with those activities. **Methods:** PA logs from 100 participants aged 59-99 in the Cardiovascular Health of Brooklyn Seniors and the Built Environment Study completed at baseline were examined. Logs were coded and entered in Excel using the Compendium of Physical Activity to characterize activities and the corresponding metabolic expenditures (METs) of those activities. Descriptive statistics, frequencies, and bivariate tests were performed in SAS to better understand the sample population. **Results:** Younger age, race/ethnicity (Latino), higher levels of education, being married or living with a partner, and higher income levels were associated with higher mean amounts of METs expended per week. Hours spent in home activity, self-care, inactivity, and miscellaneous activity represent the Compendium categories most frequently reported by the sample. The greatest mean amount of hours per week were spent in inactivity, even when eliminating sleeping from that category. **Conclusion:** Results of this study support previous research that older adults live a sedentary lifestyle. Providing preliminary data, this study characterizes activities of older adults that are not revealed by other measures of PA, such as accelerometers. Recommendations for further research are presented.

INTRODUCTION

Physical activity is recognized as a determinant of health and an important part of healthy aging, yet the majority of Americans are unaware of and/or do not meet the national physical activity guidelines developed in 2008, and more than 35% of adults in this country are obese.(1, 2) The older adult population represents the fastest growing age group in the United States and also the least active, with the majority of the population leading a sedentary lifestyle.(3, 4) Presently, less than 20% of older adults engage in physical activity, and fewer engage in strengthening exercises.(5)

Participating in regular physical activity can reduce the risk of obesity and obesity-related conditions such as type 2 diabetes and hypertension, leading risk factors for chronic disease estimated to cause 7 in 10 deaths in the United States.(2, 6) The estimated medical cost of the obesity epidemic is about $147 billion, with medical costs of obese people $1,429 higher than people of normal weight.(7) The 2008 Physical Activity Guidelines for Americans suggests between 500 and 1,000 METs per week for adults of any age to receive health benefits from physical activity.(8) Recommendations for older adults to improve and maintain health include aerobic and muscle-strengthening activities, activities to maintain or increase flexibility, and balance activities to prevent falls.(9) The Centers for Disease Control recommend at least 150 minutes of moderate-intensity aerobic activity weekly in addition to muscle strengthening activities two days per week for older adults to enjoy the health benefits of physical activity.(8) The Centers for Disease Control report that while gardening and walking are the most popular physical activities for this population, the prevalence of inactivity is greater among women, minorities, and those with lower income and education status.(10) Increasing levels of inactivity are causing public health concerns that the benefits of physical activity for older adults are not being utilized.(11)

Physical activity has been shown to reduce functional limitations of older adults and improve measures of fitness.(12, 13) Physical activity has also been shown to positively influence outcomes associated with a higher quality of life for older adults.(9) Though earlier literature suggests results of physical activity improving cognitive function are inconclusive, new findings suggest exercise is beneficial for both younger and older adult cognitive function.(12, 14) Exercise has shown to be associated with improved mood, and even low levels of light-intensity physical activity has been associated with lower levels of depression in older adults.(15-17) In addition to these physical, mental, and emotional benefits for individuals, physical activity could also help reduce medical expenditures in the older adult population. It has been shown that increasing physical activity to three

or more days from an inactive state can reduce total healthcare charges more than $2,000 within two years.(18)

It is well documented that physical activity rates decline with age, and in addition to the natural decline there are many barriers to physical activity participation for older adults. Many older adults report being intimidated by fitness facilities, and though enjoy an exercise class setting, are concerned that they may slow down the rest of the group.(19) Fear of falling is a serious health concern for older adults, and in addition to ill health, is associated with physical activity reduction.(20, 21) Efforts by caregivers and family members to protect older adults from harm, as well as common beliefs and expectations for aging, also appear to restrict physical activity efforts in older adults.(20, 22)

Measuring physical activity and validating self-reported physical activity continues to be difficult, especially for the older adult population.(23) Complicating measurement of physical activity for older adults is the tendency for this population to engage in light or low-level intensity activities and the difficulty to recall activity over long periods of time. In response to this, indirect measurement options such as physical activity surveys have been developed specifically for the older adult population.(24, 25) Activity logs or diaries have also been used to document the types of physical activity engaged in, and when used in conjunction with a tool such as the compendium of physical activity, can categorize and estimate the intensity of metabolic expenditure for many, but not all, activities.(26) Direct measures of physical activity, though generally considered more accurate, can be expensive and burdensome for the participant. Pedometers and accelerometers are the most common direct measures for older adults, but cannot describe the activity the subject is participating in.(27)

Overall, research focused on physical activity (PA) in older adults is sparse. While accelerometers have become the gold standard in PA measurement, they have not been used in a large sample of older adults. It is unclear whether they are sensitive enough to pick up low levels of activity that may be present among the older adult population, and there are few measurement tools tailored to reflect or monitor activities of daily living among urban older adults.

This study uses data collected by the Department of Preventive Medicine at Mount Sinai School of Medicine for the Cardiovascular Health of Brooklyn Seniors and the Built Environment Study (BSBE). This study aimed to examine the effect of the food and physical activity environment, as well as other built environment characteristics, on health behaviors and health outcomes.

Participants were recruited at senior centers throughout Brooklyn, and diet, physical activity, and cardiovascular risk factors were monitored. The study consisted of interviewing 1,453 English and Spanish-speaking seniors. Participants were contacted twice, once at baseline at a senior center and again one and a half to two years later. After agreeing to participate, seniors returned to their center and cycled through a number of research stations: medical screening station, nutrition interview/24 hour diet recall station, built environment review station, thoughts/perceptions/cultural attitudes about food, physical activity, environment and transportation interview station, and the accelerometer instruction and physical activity interview station. Follow-up interviews one and a half to two years later were conducted at the senior center or via telephone. Built environment audits were conducted twice, once at baseline and again two years later, investigating a 300-meter area around each participant's home.

As a student intern on BSBE, I participated in data collection, coding, and data entry at the end of second year follow-up. Though the daily activity logs had been collected in 2009, they had not been used for any data analysis. Working with the principal investigator of BSBE Dr. Kimberly Morland and study coordinator Susan Filomena, we aimed to characterize the activities of urban older adults and the associated metabolic expenditures with those activities by analyzing the self-reported daily activity logs of study participants. We anticipate this will help develop a more comprehensive list of common activities the urban older adult population participates in, as well as detail the amount of time spent and the amount of energy expended in those activities. Additionally, using the Compendium of Physical Activity will provide an alternate estimate of energy expenditure known as METs (metabolic equivalent) that may not be recorded using accelerometers. METs are calculated as the ratio of energy spent in a given activity to the rate of energy at rest. First published in 1993 and updated in 2000 and 2011, the Compendium of Physical Activities was designed to aid epidemiologic studies in assessing and standardizing energy expenditure in physical activities using METs. The Compendium currently has twenty-one activity categories and more than 800 specific codes.(28)

METHODS

Study Population

A total of 870 participants in the Cardiovascular Health of Brooklyn Seniors and the Built Environment Study completed daily activity logs at baseline in 2009 and 2010. Due to time constraints and to pilot the protocol, we generated a random sample of this cohort in SAS based on community districts, totaling 150 people. From this sample we excluded logs that had a significant amount of incomplete data (missing one or more full days), and those that were completed in Spanish due to not having a translator available. This process resulted in 100 physical activity logs suitable for coding. (Appendix 1)

Among the sample of 100 participants, 81% were women and 19% were men (Table 1). White and Latino populations were about equally represented, while blacks were underrepresented in our sample. The majority of the sample completed grade 9-12 and had a yearly income from all sources of under $30,000. The majority of the sample was single, separated, divorced or widowed, followed by married or living with a partner. Almost every Brooklyn community district is represented in the sample, as well as two districts from Queens. There were a number of Cardiovascular Health of Brooklyn Seniors and the Built Environment Study participants that attended senior centers in Brooklyn but lived in Queens, hence their appearance in our random sample.

Study Design

Participants were asked to enter all activities they engaged in for seven days on an activity log sheet for each day. After examining the logs chosen, we realized that entries range from a few activities listed per day to complete entries for each hour of the day for all seven days. Every activity log begins at 5:00 am with a line for each hour of time to record activities for that hour. (Appendix 2) We will code the activity logs using the appropriate Compendium of Physical Activity code and corresponding METs for total amount of time per activity.

We anticipate that many participants' entries will be vague, or less specific than listed in the Compendium, therefore default codes were chosen so that coding will be consistent between coders. In general, our protocol calls for underestimating the number of METs spent for a given activity. Therefore, the chosen default codes are usually described as "general" for the activity and "light

effort". Additionally, any activity where there is a choice between standing, sitting, or lying down, but the position is not specified by the participant, we will default code the activity in the sitting position.

We anticipate that many participants will list more than one activity per hour. In this case, we will split the time evenly between the listed activities in that hour. For example, if a participant wrote that they took a shower and brushed their teeth in one hour, thirty minutes will be coded as taking a shower and thirty minutes will be coded as brushing teeth. Also, if transportation was part of the activity we will treat them as two separate activities. For example, if a participant wrote that they walked to the grocery store from 2:00 pm to 3:00 pm, walking for transportation will be coded for 2:00 pm to 2:30 pm and food shopping will be coded for 2:30pm to 3pm, thirty minutes for each activity. Additionally, if the participant listed "had some lunch" or "made breakfast" for one hour, we will assume that they spent some period of time preparing the meal (as most of our participants report cooking for themselves) and then consuming it. Therefore the hour will be coded as thirty minutes food preparation and thirty minutes eating.

While coding there were alterations to our initial protocol. With walking activities, because many participants did not specify how fast they walked but did specify if they were walking for transportation or walking for pleasure/exercise, we chose one code for walking and added our own code when the participant specified walking for pleasure or exercise. We also wanted to distinguish between visiting with one person or a small group (i.e., 'visited my friend') and participating in larger group social activities (i.e., 'family BBQ party at my daughters house' or 'holiday party at senior center'). Since the Compendium only offers one code for visiting with family and friends, we created a subset code. For unspecified senior center activities we used an amended Compendium code for a group or family gathering, but if the activity at the senior center is listed (i.e. 'knitting class at senior center') we used the code that best fit that activity, and noted the location was at the senior center. For small group or one-on-one visits, we also used an amended Compendium code and for larger gatherings or parties, including parties at the senior center, we used the true Compendium code.

Coded activity logs will be entered into an Excel spreadsheet, one for each participant. The subject ID, the day of the week, and the start time and end time for each activity will be listed. Each day begins at 5am and ends at 5am the following day. The total hours per activity is calculated automatically via the formatted cells. (Appendix 3)

Data Analysis

Each Excel file was imported into SAS to develop a dataset. Age was dichotomized into ten-year intervals in order to accommodate the age range of the sample, and marital status was dichotomized into those participants who appear to be living with a partner and those who appear to be living alone. Because many of the participants are on fixed incomes, income level was dichotomized into greater than $30,000 per year from all sources and less than or equal to $29,999 per year from all sources. Descriptive statistics were performed to better understand the older adult population in our sample. The dataset was analyzed for frequencies of Compendium codes and means of METs and hours per activity category. Mean METs expended by gender, age, race, martial status, education level, and yearly income was also examined.

RESULTS

On average, study participants expended 228.58 METs per week. (Table 2) Though a recommended weekly range of METs is not determined specifically for older adults in the 2008 Physical Activity Guidelines for Americans, participants in our study fell below the recommended range for adults in general. Participants reported sleeping an average of 56.3 hours per week. The Compendium activity category participants reported the most hours spent per week was Inactivity with 21.55 hours. This category includes codes such as sitting quietly and watching television and lying in bed. Participants spent 20.21 hours and 33.63 METs per week on average in activities within the Self-Care category that includes codes for eating, bathing or showering, dressing, and taking medication or attending a medical appointment. Participants spent 19.44 hours and 43.67 METs on average per week in activities categorized Home Activity, which includes codes such as general cleaning, cooking or preparing food, doing laundry, and food or non-food shopping. Participants reported an average of 18.80 hours and 28.33 METs per week in the Miscellaneous category. This category includes codes for sitting and talking in person or on the phone, unspecified senior center activity, playing cards, sitting and reading a book or newspaper, and visiting with friends or family. Participants spent an average of 3.85 hours per week and 10.81 METs per week walking. While the full Compendium of Physical Activity has twenty-one activity categories and more than 800 specific codes, our analysis produced eighteen activity categories and ninety-five corresponding Compendium codes, as well as the four codes we amended and a code for "missing data". (Appendix 4)

When examining average METs expended per week, there was little difference found between females and males. (Table 3) The youngest participants, those aged 59 – 70, expended about ten METs more per week than older participants. The oldest study participants, those aged 81 - 99, averaged about four METs more per week than those aged 71 – 80. Participants who reported being married or living with a partner expended almost twenty more METs per week than participants who appear to be living alone. Participants that completed education levels beyond elementary school or junior high expended about twenty more METs per week than those that did not, and those with higher incomes averaged about ten more METs per week than those with incomes less than or equal to $29,999.

DISCUSSION

Our study supports previous findings that older adults live a more sedentary lifestyle, though we were able to characterize activities they participate in that would not be picked up by an accelerometer, such as self-care and home activities. Our study also supports the Center for Disease Control's findings that walking is one of the most popular physical activities for older adults, a more popular physical activity than dance, conditioning exercise, bicycling, or sports for our participants. We did not find that our study supports that same popularity finding for gardening. Given that the older adults in our study live in an urban environment and may not have the space for lawn and garden activities, this is not surprising.

Our study did not find great variation by study population characteristic with regard to mean amount of METs expended per week. Our finding that younger participants in our sample expended more METs per week on average than older participants is expected. Our study supports previous findings that those with higher levels of education and income are more physically active. Our finding that Latinos expended more METs per week than any other racial/ethnic group was unexpected, as previous research reports minorities have a higher prevalence of inactivity.

There are several limitations to this study. While the NYC Department of Aging reports that almost 25% of Brooklyn older adults have mobility and self-care issues, our study does not control for injuries, illness, chronic conditions or other physical health problems that could affect activity.(29) Having difficulties with self-care activity may account for why this category is one of the most frequent reported by our participants, as it may take more time to complete these activities for older adults with self-care impairments. Future studies of this sort should control for mobility problems as well as other characteristics that have been shown to impact physical activity such as prevalence of disease, mental health status, body mass index, smoking status, neighborhood environment and social support networks. Additionally, this study relies on self-reported activity logs, which are subject to recall bias and may be particularly problematic for older adults with memory issues. Also, instructions to participants when asked to fill out the seven-day physical activity logs may need to be improved, instructing participants very specifically as to how to fill out the log in an attempt to minimize missing data and get a fuller picture of daily activities.

While this study only provides preliminary data, the next set of tests performed may want to explore activity hours and METs by gender, race, education level, or income, with age ranges. Since this study uses data from participants recruited at senior centers, it may be interesting to examine how

much of the participants physical activity takes place at senior centers, in an effort to strengthen the argument for greater funding of these centers and their importance. Because people participating in senior centers may be different than those who don't, future studies should include a broader sample of older adults. Future studies may also want to broaden the diversity of the sample, increasing the amount of blacks participating and including Asian-Americans.

Additional research is needed to document the activities of older adults in order to examine correlates of physical activity in this population. Further research is also needed to continue developing the best ways to measure physical activities, especially tools able to measure lower levels of physical activity and routine daily activities, among older adults. The results of this study support the need for physical activity interventions among the older adult population in order to prevent the increasing prevalence of inactivity and its negative effect on health.

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Table 1. Characteristics of Study Population (n=100)

Variable name		n (%)
Mean age ± SD		72.70 ± 8.44
Age range		59 - 99
Women		81
	Mean age ± SD	73.26 ± 8.58
	Age 59-70	34 (41.98)
	Age 71-80	28 (34.57)
	Age 81-99	19 (23.46)
Men		19
	Mean age ± SD	70.31 ± 7.57
	Age 59-70	9 (47.37)
	Age 71-80	9 (47.37)
	Age 81-99	1 (5.26)
Race/Ethnicity		
	White	45 (45.00)
	Black	11 (11.00)
	Latino	43 (43.00)
	Other	1 (1.00)
Marital status		
	Single, separated, divorced, or widow(er)	65 (65.00)
	Married or living with partner	33 (33.00)
	Don't know or refuse to answer	2 (2.00)
Yearly income from all sources		
	Less than or equal to $29,999	56 (56.00)
	$30,000 or greater	25 (25.00)
	Don't know or refuse to answer	19 (19.00)
Highest grade/level of education		
	Elementary to junior high (includes 1-12 years)	7 (7.00)
	High school/prepatory school (9-12 years)	52 (52.00)
	Trade school/vocational school or university/college	35 (35.00)
	Other	6 (6.00)

Table 2. Mean hours and METs per week for selected activity categories

	Mean	SD*	Min	Max
Total Hours Reported	167.93	0.18	167.00	168.49
Total METs Reported	228.58	36.73	121.60	338.99
Missing Hours	15.03	17.58	0.00	84.00
Inactivity Hours	21.55	10.90	0.50	55.00
Sleep Hours	56.30	10.14	15.00	77.00
Self Care Hours	20.21	6.21	7.00	42.00
Self Care METs	33.63	10.87	8.50	67.21
Home Activity Hours	19.44	10.43	1.00	52.75
Home Activity METs	43.67	24.67	2.00	116.12
Home Repair Hours	0.67	3.60	0.00	29.00
Home Repair METs	1.68	9.03	0.00	72.50
Gardening Hours	0.20	0.91	0.00	7.00
Gardening METs	0.62	2.92	0.00	22.00
Walking Hours	3.85	5.17	0.00	31.00
Walking METs	10.81	14.52	0.00	86.80
Conditioning Exercise Hours	1.71	3.06	0.00	22.00
Conditioning Exercise METs	8.10	15.88	0.00	121.00
Bicycling Hours	0.05	0.50	0.00	5.00
Bicycling METs	0.34	3.40	0.00	34.00
Dance Hours	0.25	0.80	0.00	6.00
Dance METs	1.97	6.15	0.00	46.80
Sports Hours	0.20	0.95	0.00	7.00
Sports METs	0.57	2.82	0.00	22.00
Religious Activity Hours	3.22	6.28	0.00	48.50
Religious Activity METs	5.54	11.51	0.00	95.10
Volunteering Hours	0.84	2.65	0.00	16.00
Volunteering METs	1.92	6.32	0.00	35.25
Misc Hours	18.80	12.20	0.00	63.50
Misc METs	28.33	18.23	0.00	86.95
* SD, standard deviation				

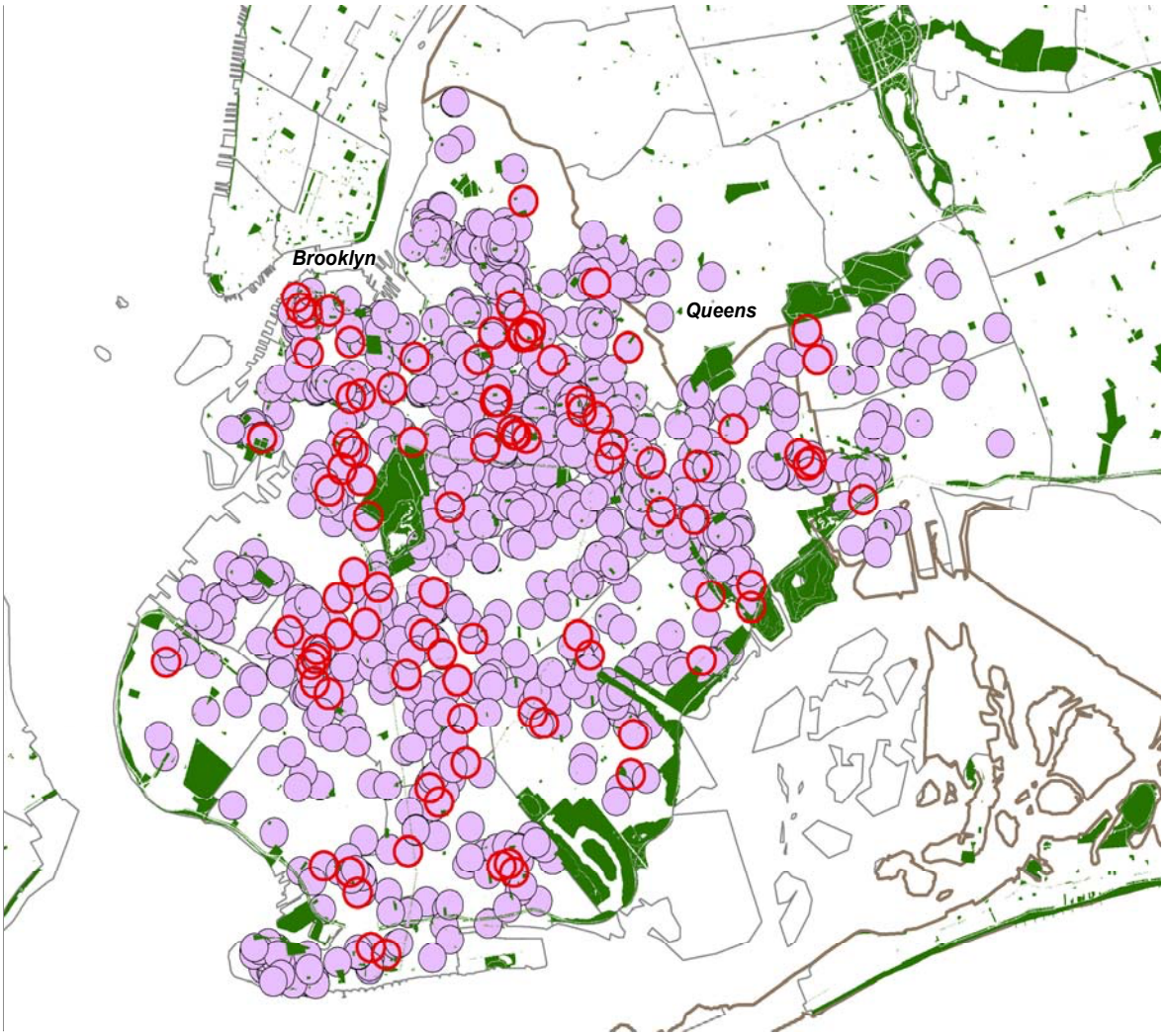
Table 3. Mean METs per week by demographic variable

Characteristic		n =	Mean METs/week	SD*	Low (n=49)**	Moderate (n=26)***	High (n=25)****
					n (%)	n (%)	n (%)
Gender							
	Female	81	228.08	37.55	38 (77.55)	21 (80.77)	22 (88.0)
	Male	19	230.72	33.89	11 (22.45)	5 (19.23)	3 (12.00)
Age							
	Age 59-70	43	236.62	35.5	17 (34.69)	12 (46.15)	14 (56.00)
	Age 71-80	37	221.04	41.87	22 (44.90)	7 (26.92)	8 (32.00)
	Age 81-99	20	225.26	25.55	10 (20.41)	7 (26.92)	3 (12.00)
Race/Ethnicity							
	White	45	221.46	34.79	28 (57.14)	8 (30.77)	9 (36.00)
	Black	11	223.84	53.68	5 (10.20)	3 (11.54)	3 (12.00)
	Latino	43	236.83	32.99	16 (32.65)	14 (53.85)	13 (52.00)
	Other	1	246.59	0	0 (0.00)	1 (3.85)	0 (0.00)
Marital status							
	Single, separated, divorced or widow(er)	65	223.87	36.28	36 (73.47)	13 (50.00)	16 (64.00)
	Married or living with partner	33	241.01	33.59	11(22.45)	13(50.00)	9 (36.00)
	Don't know or refuse to answer	2	176.49	35.42	2 (4.08)	0 (0.00)	0 (0.00)
Highest grade/level of education							
	Elementary to junior high (includes 1-8 years)	7	210.89	31.58	5 (10.20)	1 (3.85)	1 (4.00)
	High school/prepatory school (9-12 years)	52	229.56	41.38	26 (53.06)	12 (46.15)	14 (56.00)
	Trade school/vocational school or university/college	35	233.39	28.62	13 (26.53)	13 (50.00)	9 (36.00)
	Other	6	212.68	39.58	5 (10.20)	0 (0.00)	1 (4.00)
Yearly income from all sources							
	Less than or equal to $29,999	56	223.77	40.57	30 (61.22)	13 (50.00)	13 (52.00)
	$30,000 or greater	25	235.19	26.35	10 (20.41)	9 (34.62)	6 (24.00)
	Don't know or refuse to answer	19	234.05	36.06	9 (18.37)	4 (15.38)	6 (24.00)

* SD, standard deviation ** less than 231.40 METs *** greater than 231.40 and less than 253.05 METs **** greater than 253.05 and less than 338.99 METs

Appendix 1. Distribution of study participants

Brooklyn Community District (n = 97)	n (%)	***Neighborhoods***
1	4 (4.00)	East Williamsburg, Greenpoint, Northside, Southside, Williamsburg
2	8 (8.00)	Boerum Hill, Brooklyn Heights, Clinton Hill, Downtown Brooklyn, DUMBO, Farraqut Houses, Fort Greene, Fulton Ferry, Brooklyn Navy yard, Vinegar Hill
3	14 (14.00)	Bedford-Stuyvesant, Stuyvesant Heights, Tompkins Park North
4	3 (3.00)	Bushwick
5	8 (7.00)	Broadway Junction*, City Line, Cypress Hills, East new York, Highland Park, New Lots, Spring Creek, Starrett City
6	9 (9.00)	Carroll Gardens, Cobble Hill, Gowanus, Park Slope, Red Hook
7	2 (2.00)	Industry City, Sunset Park, Windsor Terrace
8	5 (5.00)	Crown Heights, Propect Heights, Weeksville
9	1 (1.00)	Crown Heights South, Prospect Lefferts Gardens, Wingate
10	2 (2.00)	Bay Ridge, Dyker Heights, Fort Hamilton
11	0 (0.0)	Bath Beach, Bensonhurst, Gravesend*, Mapleton
12	9 (9.00)	Borough Park, Kensington, Ocean Parkway*
13	4 (4.00)	Brighton Beach, Coney Island, Gravesend*, Homecrest*, Sea Gate, West Brighton
14	10 (10.00)	Ditmas Park, Flatbush*, Manhattan Terrace, Midwood, Ocean Parkway*, Prospect Park South
15	7 (7.00)	Gerritsen Beach, Gravesend*, Homecrest*, Kings Highway, Manhattan Beach, Plumb Beach, Sheepshead
16	4 (4.00)	Broadway Junction*, Brownsville, Ocean Hill
17	2 (2.00)	East Flatbush, Farragut, Flatbush*, Northeast Flatbush, Remsen Village, Rugby
18	5 (5.00)	Bergen Beach, Canarsie, Flatlands, Georgetown, Marine Park, Mill Basin, Mill Island, Paerdegat Basin
Queens Community District (n = 3)		
9	2 (2.00)	Kew Gardens, Ozone Park*, Richmond Hill, Woodhaven
10	1 (1.00)	Howard Beach, Lindenwood, Old Howard Beach, Ozone Park, South Ozone Park
		* in more than one community district



Red circles: 300 meter audit zone around our study participants homes
Purple circles: 300 meter audit zone around Cardiovascular Health of Brooklyn Seniors and the Built Environment Study participants homes

Appendix 2. Blank activity log

Monday

Time of day (hours)			Were you inside or outside?		What were you doing?
Morning	5	am	In	Out	
	6	am	In	Out	
	7	am	In	Out	
	8	am	In	Out	
	9	am	In	Out	
	10	am	In	Out	
	11	am	In	Out	
Noon	12	pm	In	Out	
Afternoon	1	pm	In	Out	
	2	pm	In	Out	
	3	pm	In	Out	
	4	pm	In	Out	
Night-time/Evening	5	pm	In	Out	
	6	pm	In	Out	
	7	pm	In	Out	
	8	pm	In	Out	
	9	pm	In	Out	
	10	pm	In	Out	
	11	pm	In	Out	
	12	am	In	Out	
	1	am	In	Out	
	2	am	In	Out	
	3	am	In	Out	
	4	am	In	Out	

Appendix 3. Sample coded activity log in Excel

Subject	Day	Start	End	TotalHrs	Code	Note	Location	
BSBE_0907	Fri	5:00 AM	7:00 AM	2.00	7030			
BSBE_0907	Fri	7:00 AM	7:30 AM	0.50	13050			
BSBE_0907	Fri	7:30 AM	8:00 AM	0.50	13030			
BSBE_0907	Fri	8:00 AM	8:30 AM	0.50	16016			
BSBE_0907	Fri	8:30 AM	9:00 AM	0.50	17152			
BSBE_0907	Fri	9:00 AM	9:30 AM	0.50	9055.1			
BSBE_0907	Fri	9:30 AM	10:00 AM	0.50	13030		Senior Center	
BSBE_0907	Fri	10:00 AM	10:30 AM	0.50	17152			
BSBE_0907	Fri	10:30 AM	11:00 AM	0.50	13036.1			
BSBE_0907	Fri	11:00 AM	11:30 AM	0.50	9055.1			
BSBE_0907	Fri	11:30 AM	12:00 PM	0.50	13030		Senior Center	
BSBE_0907	Fri	12:00 PM	2:00 PM	2.00	11580			
BSBE_0907	Fri	2:00 PM	3:00 PM	1.00	66	on way home		
BSBE_0907	Fri	3:00 PM	4:00 PM	1.00	66	stay at home		
BSBE_0907	Fri	4:00 PM	6:00 PM	2.00	5065			
BSBE_0907	Fri	6:00 PM	6:40 PM	0.67	5050			
BSBE_0907	Fri	6:40 PM	7:20 PM	0.67	13030			
BSBE_0907	Fri	7:20 PM	8:00 PM	0.67	7020			
BSBE_0907	Fri	8:00 PM	10:00 PM	2.00	7070			
BSBE_0907	Fri	10:00 PM	11:00 PM	1.00	13030			
BSBE_0907	Fri	11:00 PM	5:00 AM	6.00	7030			
BSBE_0907	Sat	5:00 AM	6:00 AM	1.00	7030			
BSBE_0907	Sat	6:00 AM	7:00 AM	1.00	13050			
BSBE_0907	Sat	7:00 AM	8:00 AM	1.00	13030			
BSBE_0907	Sat	8:00 AM	9:00 AM	1.00	9040			
BSBE_0907	Sat	9:00 AM	9:30 AM	0.50	5050			
BSBE_0907	Sat	9:30 AM	10:00 AM	0.50	13030			
BSBE_0907	Sat	10:00 AM	12:00 PM	2.00	5040			
BSBE_0907	Sat	12:00 PM	1:00 PM	1.00	5050			
BSBE_0907	Sat	1:00 PM	2:00 PM	1.00	13030			
BSBE_0907	Sat	2:00 PM	4:00 PM	2.00	9030			
BSBE_0907	Sat	4:00 PM	6:00 PM	2.00	5050			
BSBE_0907	Sat	6:00 PM	7:00 PM	1.00	13030			
BSBE_0907	Sat	7:00 PM	10:00 PM	3.00	7020			
BSBE_0907	Sat	10:00 PM	11:00 PM	1.00	7070			
BSBE_0907	Sat	11:00 PM	5:00 AM	6.00	7030			
BSBE_0907	Sun	5:00 AM	7:00 AM	2.00	7030			

Appendix 4. Mean hours per week of activity categories with mean MET's per week and frequency for each code

Activity Category	Mean Hours/Week	SD	Code	Mean METs/Week	SD	Description of Codes	Frequency
Missing Data	15.01	17.58					
			66	0.00	0.00	missing data	800.00
Bicycling	0.05	0.50					
			1011	11.33	7.85	bicycling, to/from work, self-selected pace	3.00
Conditioning Exercise	1.71	3.06					
			2011	4.67	1.81	bicycling, stationary 30-50 watts, very light to light effort	6.00
			2060	8.15	4.71	health club exercise, general	52.00
			2064	3.93	2.02	home exercise, general	42.00
			2065	8.10	5.53	stair-treadmill ergometer, general	10.00
			2101	2.49	1.35	stretching, mild	9.00
			2110	3.40	0.00	teaching exercise class (e.g. aerobic, water)	2.00
			2120	10.60	0.00	water aerobics, water calisthenics, water exercise	4.00
			2150	3.28	1.28	yoga, Hatha	12.00
Dancing	0.26	0.80					
			3025	4.50	.	ethnic or cultural dancing (e.g. Greek, Middle Eastern, hula, salsa, merengue, bamba y plena, flamenco, belly, and swing)	1.00
			3031	11.24	3.87	general dancing (e.g. disco, folk, Irish step, line, polka, contra, country)	17.00
Fishing and Hunting	0.02	0.20					
			4001	7.00	.	fishing, general	1.00
Home Activity	19.44	10.43					
			5011	3.67	1.78	cleaning, sweeping, slow, light effort	13.00
			5023	2.00	0.68	mopping, standing, light effort	5.00
			5032	2.30	0.00	dusting or polishing furniture, general	4.00
			5035	2.45	1.04	kitchen activity, general (e.g. cooking, washing dishes, cleaning up), moderate effort	81.00
			5040	3.70	2.88	cleaning, general (straightening up, changing linen, carrying out trash), light effort	186.00
			5043	2.38	0.87	vacuuming, general, moderate effort	9.00
			5050	1.23	0.85	cooking or food preparation - standing or sitting or in general (not broken into stand/walk components), manual appliances, light effort	1230.00
			5053	1.57	1.36	feeding household animals	25.00
			5055	2.08	0.65	putting away groceries (e.g. carrying groceries, shopping without a grocery cart), carrying packages	6.00
			5060	3.36	2.03	food shopping with or without a grocery cart, standing or walking	78.00
			5065	3.99	2.93	non-food shopping with or without a grocery cart, standing or walking, "errands"	255.00
			5070	1.41	0.48	ironing	7.00
			5080	1.95	0.95	knitting, sewing, light effort, wrapping presents, sitting	18.00
			5090	3.49	2.11	laundry, fold or hang clothes, put clothes in washer or dryer, packing suitcase, washing clothes by hand, implied standing, light effort	75.00
			5100	1.48	0.71	making bed, changing linens	20.00
			5131	1.76	0.42	scrubbing floors, on hands and knees, scrubbing bathroom, bathtub, light effort	7.00
			5146	3.50	.	standing, packing/unpacking boxes, occasional lifting of lightweight household items, loading or unloading items in car, moderate effort	1.00
			5148	1.56	1.33	watering plants	2.00
			5165	8.75	2.47	walking, modertate tasks, non-cleaning (readying to leave, shut/lock doors, close windows, etc.)	2.00
			5170	3.30	1.56	sitting, playing with child(ren), light effort, only active periods	2.00
			5185	4.51	4.31	child care, sitting/kneeling (e.g. dressing, bathing, grooming, feeding, occasional lifting of child), light effort, general	31.00
			5190	1.25	.	sit, play with animals, light effort, only active periods	1.00
			5200	4.33	1.97	elder care, disabled adult, bathing, dressing, moving into and out of bed, only active periods	6.00
			5205	2.30	.	elder care, disabled adult, feeding combing hair, light effort, only active periods	1.00

Home Repair	0.67	3.60					
			6030	8.25	2.33	automobile repair, light or moderate effort	2.00
			6126	8.46	2.71	home repair, general, light effort	17.00
			6225	4.00	2.83	washing and waxing a car	2.00
Inactivity	21.55	10.90					
			7010	2.45	1.25	lying quietly and watching television	11.00
			7011	2.28	1.53	lying queitly, doing nothing, lying in bed awake, listening to music (not talking or reading)	38.00
			7020	2.79	1.77	sitting quietly and watching television	813.00
			7021	2.02	1.33	sitting queitly, general	142.00
			7025	3.09	1.67	sitting, listening to music (not talking or reading) or watching a movie in a theater	26.00
			7070	2.00	1.09	reclining, reading	25.00
			7075	0.75	0.27	meditating	6.00
Sleeping	56.30	10.14					
			7030	3.97	1.93	sleeping	1347.00
Lawn and Garden	0.20	0.91					
			8135	2.00	.	planting, potting, transplanting seedlings or plants, light effort	1.00
			8239	6.65	4.70	weeding, cultivating garden, light-to-moderate effort	5.00
			8260	5.40	2.51	yard work, general, light effort	5.00
Miscellaneous	18.80	12.20					
			9000	2.76	1.46	board game playing, sitting	25.00
			9005	10.83	9.83	casino gambling, standing	6.00
			9010	2.88	1.58	card playing, sitting	101.00
			9030	1.78	1.26	sitting, reading, book, newspaper, etc.	298.00
			9040	1.80	1.31	sitting, writing, desk work, typing	112.00
			9045	1.00	0.00	sitting, playing traditional video game, computer	2.00
			9050	1.80	0.00	standing, talking in person, on the phone, computer, or text messaging, light effort	4.00
			9055	2.00	1.27	sitting, talking in person, on the phone, computer, or text messaging, light effort	151.00
			9055.1	2.22	1.50	at senior center, activity unspecified	252.00
			9055.2	2.65	1.75	visiting friend or relative (small group setting)	99.00
			9065	4.07	1.94	sitting, in class, general, including note-taking or class discussion, "went to meeting"	46.00
			9071	5.65	6.08	standing, miscellaneous, waiting in line, voting, visiting museum	10.00
			9075	2.13	1.10	sitting, arts and crafts, carving wood, weaving, spinning wool, light effort	7.00
			9085	5.00	0.00	standing, arts and crafts, sand painting, carving, weaving, light effort	2.00
			9100	4.40	2.74	retreat/family reunion acivities involving sitting, relaxing, talking, eating, parties at Senior Center or elsewhere	53.00
			9115	5.87	2.21	sitting at a sporting event, spectator	7.00
Occupation	1.51	6.21					
			11580	6.98	4.01	sitting tasks, light effort (e.g. ofiice work, chem lab work, computer work, light assmbly repair, watch repair, reading, desk work)	30.00
			11600	8.44	2.24	standing tasks, light effort (e.g. bartending, store clerk, assembling, filing, duplicating, librarian, putting up Christmas tree)	4.00

Running	0.08	0.85					
			12010	10.20	2.68	jog/walk combination (jogging component of less than 10 minutes)	5.00
Self-Care	20.21	6.21					
			13000	2.06	0.73	getting ready for bed, general, standing	57.00
			13010	0.84	0.34	bathing, sitting	60.00
			13020	1.87	0.86	dressing, undressing, standing or sitting	164.00
			13030	1.07	0.69	eating, sitting	1680.00
			13036	1.16	0.44	taking medication, sitting or standing	73.00
			13036.1	3.02	1.85	medical appointments	65.00
			13040	1.43	0.71	grooming, washing hands, shaving, brushing teeth, putting on make-up, sitting or standing	102.00
			13045	1.25	0.00	hairstyling, standing	4.00
			13046	2.73	2.58	having hair or nails done by someone else, sitting	10.00
			13050	1.35	0.60	showering, toweling off, standing	471.00
Sports	0.20	0.95					
			15080	3.21	1.22	billiards	7.00
			15090	12.00	.	bowling	1.00
			15660	12.00	.	table tennis, ping pong	1.00
			15670	2.63	0.75	tai chi, qi gong, general	4.00
Transportation	3.96	5.61					
			16010	2.50	1.03	automobile or light truck (not semi) driving	111.00
			16015	1.56	0.95	riding in a car or truck	35.00
			16016	1.49	0.82	riding in a bus or train	212.00
Walking	3.85	5.17					
			17133	1.44	0.46	stair climbling, slow pace	6.00
			17152	2.49	1.94	walking, 2.0 mph, level, slow pace, firm surface	238.00
			17152.1	4.66	3.06	walking for pleasure, "went for a walk"	101.00
			17165	3.00	0.00	walking the dog	2.00
			17200	1.25	0.24	walking , 3.5 mph, level, brisk, firm surface, walking for exercise	2.00
Water Activities	0.07	0.41					
			18310	14.00	3.46	swimming, leisurely, not lap swimming, general	3.00
Religious Activities	3.22	6.28					
			20000	3.90	0.00	sitting in church, in service, attending a ceremony, sitting quietly	2.00
			20005	5.50	3.16	sitting in church, talking or singing, attending a ceremony, sitting, active participation	71.00
			20010	1.14	0.73	sitting, reading religious materials at home, prayer at home	68.00
			20039	7.80	3.01	walk/stand combination for religious purposes, usher	10.00
Volunteer Activities	0.84	2.65					
			21005	3.44	2.24	volunteer - sitting, light office work, in general	17.00
			21070	5.57	2.46	walk/stand combination for volunteer purposes	24.00

Health Information Technology and Mental Health:
Developing a Public Health Intervention for New York City

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Abstract

Objective: To customize and launch an internet-based intervention to address the mental health needs of New Yorkers exposed to the disastrous effects of Hurricane Sandy.

Methods: The five-module application Bounce Back, originally created in response to Hurricane Ike in Texas, was selected for use. We customized Bounce Back to make it more appropriate for New York City users, editing content and programming instructions in these areas: urbanization and localization; programmatic messaging; increasing usability and literacy-level appropriateness; copyediting; and branching logic. After customization was complete, the application was beta-tested by program staff and demonstrated for Agency leadership.

Results: The customization process produced scripts and on-screen changes of content for all five modules that was more reflective of the demographics and vernacular of the New York City population; corrected grammar, spelling and formatting; and streamlined text. However, the fundamental problems of the application, including poor navigation and density, proved insurmountable within our resources, and the decision was made to abandon the project prior to launch.

Conclusions: The urgency of choosing and disseminating a product in the aftermath of Hurricane Sandy derailed the integral review, evaluation and selection process; the application that was chosen ultimately could not meet our needs. Future steps should include a thorough selection and preparation process during business-as-usual time, as well as an application that would be appropriate for use in general and in the wake of a disaster.

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Introduction

Mental illnesses, including mood, behavior, and substance-use disorders, present a world-wide public health problem.[1–3] Globally, these disorders are a leading cause of disability, are associated with a significantly diminished quality of life, excess mortality and considerable societal costs.[4] One of the most common disorders, Major Depressive Disorder (MDD), is projected to be the second most disabling medical condition worldwide by 2030, led only by HIV/AIDS.[4]

Despite the universal pervasiveness and the related burden of these illnesses, care and treatment continue to fall short of the need.[4] A significant number of affected people do not seek professional help – it is estimated that only 25 – 50% of those with mild, moderate, and severe disorders seek treatment. There is a robust body of research indicating that individuals exposed to a potentially traumatic event are at increased risk of developing of a range of mental health issues, including post-traumatic stress disorder, depression, drug and alcohol abuse, and increased cigarette use.[5] However, certain of these at-risk groups seek mental health services at strikingly low rates.[6]

Many individuals who might benefit from mental health treatment are reluctant to initiate care because of stigma, discomfort in talking about private issues with an unfamiliar person, and fear about loss of confidentiality.[7] Many go without care at all, or delay seeking it until they are in a crisis state, when treatment is more difficult. Though the gap between prevalence and treatment can be, in part, attributed to consumer preference (low perceived need, cultural beliefs around the unacceptability of mental health treatment), poor access also interferes with the receipt of treatment.[7] This is true regardless of a person's insurance status: individuals with private or public insurance often find it difficult to locate or receive quality services due to limited provider availability or long waiting lists;[7] in most Medicaid and uninsured populations, the need for services far exceeds the capacity of safety-net providers.[7] Moreover, many who seek help often face long waiting periods and do not receive evidence-based treatment.[4] Access to quality mental health care is limited in nearly all populations, but is particularly limited for vulnerable populations such as the oldest and youngest persons, racial/ethnic minorities, and socioeconomically disadvantaged populations.[7]

In light of these barriers, there is growing interest and evidence base for easily accessible, empirically-supported, cost-effective treatments.[4] The rapid expansion of the internet and mobile technology offers great potential in the treatment of mental disorders, in the possibly of providing widespread, inexpensive, standardized evidence-based treatment, particularly for those with limited access to services due to availability and/or stigma.[4] Health Information Technologies (HIT) such as smart phones, apps or desktop software, and the Internet are rapidly becoming a mechanism for delivering mental health care.[8]

Interventions delivered through HIT may lower the threshold for people who do not seek traditional treatment, thus extending the reach of entry-level mental health services.[7] Additionally, most face-to-face mental health care is focused on the treatment of active disorders or conditions; there are few traditional preventative or early-intervention mental health programs available at a population level. Compared to face-to-face interventions, HIT can be more widely distributed at a lower cost per person and thus may facilitate prevention programs more efficiently[7]. While still in early stages, research on the use of HIT interventions for mental health following a disaster has shown promise in fostering post-disaster resilience and recovery.[5,9]

Worldwide, internet usage has more than doubled since 2005; 81% of the American population uses the internet, and 97% of American youth between the ages of 12 and 18 use the internet.[10] Twenty-six percent of adult internet users have searched for information about mental illness, and 25% of young people have used the internet as a source of mental health information, searching for depression, violence, and problems with drugs and alcohol.[9] However, it is necessary to recognize the continued existence of the digital divide, referring to the disparity in internet access and usage between the general population and underserved populations, including minorities and the elderly.[9] Though recent data indicates that the digital divide may be decreasing, the required reading level for most websites is 12thgrade , which may exclude less educated people even though they may be connected to the internet.[9]

Mental health HIT includes all forms of electronic mental health services delivered over the internet, ranging from informational and educational products to direct services offered by professionals.[9] There are four general categories of HIT: Informational, Screening, Clinician-Delivered Care, and Self-Management.

Informational: There are many informational mental health websites, with varying degrees of accuracy and comprehensiveness. Some have accurate information but lack a complete evidence-based overview of the disorder.[9] Of the health sites visited most often among US users, those most accessed are medical journals (45%), commercial health sites (44%), and academic/research institutions (43%).[9]

Screening: The purpose of online screening tools is to help consumers identify personal mental health conditions.[9] There is some evidence that self-assessment may be more accurate than clinician assessment: people with depressive symptomology and suicidal ideation in particular prefer computer-based over personal interviews.[9] Many clinician-administered screening instruments have been adapted for self-use, however not all have been validated for self-administration.

Clinician-delivered care: Clinician-delivered care refers to both individual and group sessions that are conducted by a clinician, and occur either through email or in real-time via messaging or video chat. Though informational, screening, and self-management HIT can be used in tandem with clinician-directed care, this category is specific to the therapeutic time delivered by a clinician. It has been shown to be effective, but predominantly when used as an adjunct to in-person therapy; potentially due to the

loss of nonverbal clues that prohibits communication through body language, voice fluctuations and intonations.[9]

Self-Management: Self-management interventions are primarily used for posttraumatic stress disorder, depression, anxiety and panic disorders, and alcohol misuse. Most interventions have common components – they are developed from a Cognitive-Behavioral Therapy framework and include modules that address psychoeduction, cognitive restructuring, goal setting, and exposure.[6] Existing studies suggest that these Internet-based interventions (IBI) can be efficacious in addressing a range of mental health symptoms; a number of studied IBIs produced effect sizes comparable to clinician-administered interventions for anxiety and depression. [6] The research around the efficacy of IBIs for PTSD is not as conclusive, and IBIs have shown less utility for alcohol misuse, substance use disorders, eating disorders, and tobacco-cessation.[6,11,12]

Though application of technology is evolving and expanding rapidly, there is little consensus in the field on the best use of HIT for promoting mental health on a population-level. Though there is a robust and growing body of literature that indicates that HIT can and does deliver efficacious interventions at a low cost in the privacy of the consumer's home, the challenge of having these tools used population-wide continues. For example, two depression IBIs developed in Australia were found to be highly effective and user-friendly, however, only about 20% of users were spontaneous; the rest were recruited by screening questionnaires sent to randomly selected registered voters, selected students, or groups that were otherwise pre-selected.[13]

Continued research is needed to understand how to promote and utilize mental health HIT population-wide, and to use HIT to the fullest extent to improve the delivery of and access to mental health care.

Agency background

The New York City Department of Health and Mental Hygiene is the governmental agency responsible for public health. The Department's mission is to protect and promote the health of all New Yorkers, and to promote the full realization of those with disabling conditions.[14] The Department achieves this mission through a) ongoing assessment of the health status of the community, b) formulating policies and implementing programs to promote the public's health, and c) ensuring access to services by providing direct public health services or facilitating access to health care and ancillary services.[14] The Department's Division of Mental Hygiene's mission is to partner with consumers, families, advocates, and providers to ensure access to high quality services and to improve the lives of New Yorkers with mental health and substance use disorders and those with developmental disabilities and delays.[14]

The Department's 2013 budget was $38 million; and employs approximately 6000 New Yorkers.[14]

Project description

The Division of Mental Hygiene had begun examining the potential of public-facing HIT to advance its agenda in the early fall of 2012. Hurricane Sandy made landfall in New York City on October 30, 2012, and shortly afterwards, the Division's leadership made the decision to launch an IBI to serve the immediate and short-term mental health needs of New Yorkers affected by Hurricane Sandy. Mental health IBIs interventions had been previously used and evaluated in other disaster-affected populations (e.g., recent rape and assault; 2008 Hurricane Ike; September 11, 2001 terrorist attacks)[5,11]; however, all of these interventions were conducted in a research setting at least six months following the precipitating event[11]. There was no peer-reviewed evidence of any mental health IBI that was used outside of a research setting in a population representative of New York City's, nor one that had launched less than six months after the disaster.

Though the Division had not yet finished its examination and evaluation of all of the potential mental health IBIs, the pressing need to offer easily-accessed mental health support as soon as possible prompted the decision to select an application that had been developed by a team of researchers at the Medical University of South Carolina (MUSC), in response to Hurricane Ike[11]. The application, Bounce Back, was a web-based product with modules to help the user in five different areas: panic, stress, alcohol use, smoking, and depression[15]. Bounce Back had content in three of the four HIT categories: screening, informational, and self-management.

Bounce Back was chosen for a few key reasons. There was peer-reviewed evidence support for its feasibility and efficacy in a research setting[11], and it was "out of the box" – in other words, complete and ready to be used. The development and production teams at MUSC were willing and available to customize the application to better suit New York users. Because the application was developed by a research institutions and not a commercial business, the costs involved with licensing, customization, and support were relatively low. In addition, the content of the application was broad enough to be relevant outside of a disaster-context; most components did not address the disaster specifically, and the application could be used by many people with mental health challenges city-wide – not just those directly affected by the Hurricane.

The purpose of this project was to customize Bounce Back for New Yorkers, and ensure that its usability and presentation was appropriate to be branded and promoted by the Department. The author of this paper was the Project Manager, and coordinated the efforts discussed in the following sections. This paper will describe the customization process and challenges, the ultimate decision to abandon the project prior to launch, and discuss factors involved in the project's failure as well as recommendations for alternate processes in future similar projects.

Methods

Stage 1: Customization

Once Bounce Back was selected as the application to use, the first stage of this process was determining how to customize it for New York City users, as well as make it specific to those who were impacted by Sandy while creating broadness to be applicable to and potentially benefit New Yorkers whose mental health and substance use issues are not linked to the storm.

A team of staff members from different areas of the agency – Mental Health; Alcohol and Drug Use Prevention, Care and Treatment; Children, Youth and Families; and Tobacco Control – initially reviewed the application online, acting as users from one of MUSC's pilot settings. This initial review was not systematic, but provided the team with the opportunity to learn the application's interface and structure in the way an end-user would.

Team members' first impressions were that the application was clunky, not user-friendly, and too text-heavy. However, the application did have promise: it was evidence-supported, it had a substantial amount of information and tools in several different areas of mental health, and perhaps most importantly, it was ready to launch as soon as it had been customized. Because of its promise, and the desire to launch as soon as possible in order to be relevant to Sandy response, the team decided to move forward with the customization process despite concerns about the functionality of the application.

MUSC provided us with word documents that contained the scripts of each module. The programming language was included in the scripts, however the graphics were not. The scripts were written in advance of the modules' original development; they were not updated to correspond to the changes that were made throughout the course of the development process. This proved challenging, in that there were multiple instances where the text on the screen did not match the script or that the programming language written into the script was not reflected in the mapping of the module.

The editing /customization fell into five categories: urbanization/localization; aligning content /programmatic message with that of DOHMH; increasing usability and literacy-level appropriateness; copy editing; and correcting branching errors.

Urbanization and localization

Bounce Back was created by a team of researchers in South Carolina for users in South Carolina and Texas. To make the program more appropriate for New Yorkers, some of the vernacular needed to change, for instance, replacing the term "pop" for "soda", or "sucker" for "sucking candy". We also felt it necessary to change many of the graphics; several of the stock photos that originally accompanied the text were in bucolic settings, and not representative of New York City. In addition, the people in many of the original photos were white, and approximately between the ages of 20 and 45. We asked for changes to many of these photos to better reflect the racial, ethnic, and age makeup of our intended users.

Aligning content/programmatic message with that of DOHMH

We made heavy edits to the Smoking module in order to align the content with the messaging around tobacco cessation that DOHMH already had, mostly in the form of the NYC Quits website. The edits included adding New York City-specific resources for quitting smoking, including information about local low-cost ways to get over-the-counter nicotine replacement therapies, and altering some language for factual correctness - for example, changing "…increasing certain health problems such as heart attacks…" to "…increasing *risk of* certain health problems such as heart attacks…". There were also edits to highlight certain quitting strategies that NYC Quits promotes, such as adding "cost of cigarettes" to the interactive list of pros and cons of smoking.

Both the Panic and PTSD modules had guided exercise for the user to increase his/her exposure to bodily sensations associated with a panic or trauma-response. Though these exercises are commonly used in a therapeutic environment, our team was concerned about issuing this guidance on a website, for an individual to use without the presence of a mental health professional. We edited these pages to add a warning before each exercise that encouraged the use to use caution when performing the exercise, to consult with his/her physician prior to doing the exercise if the individual had any medical conditions, and to seek in-person help if needed.

Increasing usability and literacy-level appropriateness

The team found that many of the pages were text heavy, with an average of 400 words per page, all laid out in the same font size and style. We thought the density of the text was a barrier to an individual reading it and advancing through the module, and suggested reducing the word count. We also believed that the modules were too long, and requested that MUSC reduce the number of pages of content.

The text was written in the second person, and the tone was informal and conversational. While we considered this beneficial in general, there were some places where it felt inappropriate and we asked for it to be removed. For example, in the Panic module, a section discussing fear of losing control said "If people with panic attacks were at high risk of driving off a bridge or getting into an accident during an attack, you can bet they would not be allowed to get driver's licenses so easily!"; though the statement made a point, we believed it was an unsuitable example and asked for it to be removed.

Copy editing

Though the application had been tested and used by research subjects, there were still spelling, grammatical, capitalization, and formatting errors throughout. We made edits to all of these errors in order to create a more professional-looking product.

Correcting branching errors

Again, though MUSC had tested the application and it had been used by research subjects, there were still errors in the page sequencing. For instance, in the Alcohol module, if a user responded "yes" to the screening question "Have you or someone else been injured as a result of your drinking?", the following page would read "[Your answers] indicate that you are not currently at risk for experiencing drinking-related problems." The other major functional issue was the absence of a "back" button, for a user to change his/her answer or explore a different route in the module. In the absence of a "back" button, if a

user instead used the browser's back button, the module would not register the change in answer and would progress with the originally selected answer. Alarming problems like this created an unexpected need for systematic branching review and qualitative review. The Agency's Department of Information Technology (IT) was asked to participate in this review, and did a comprehensive analysis of branching errors. Program staff did less-systematic branching reviews while assessing content.

Stage 2: Updating the application

Because MUSC still held the rights to Bounce Back and controlled the platform, all edits needed to be done by their staff. We submitted to them the scripts with track changes and comments containing our edits, a quality analysis spreadsheet developed by IT that listed the branching errors, and screenshots with comments for graphics or formatting that needed a visual to best explain the proposed edits.

Stage 3: Testing and Demonstration

The final stage of this process was a systematic side-by-side comparison between the scripts and the live modules to ensure that all of the edits were made, and to consider the overall impact of changes that could not be made. This included going through each module multiple times to ensure that all branches were viewed. Once the project team finished testing the application, we demonstrated the re-vamped application to senior staff within the Division of Mental Hygiene.

Results

Stage 1: Customization

The customization process produced five revised scripts, each between 30 and 45 pages long. All of our edits were done in track changes and comment bubbles to simplify the updating process. The revised scripts also now included graphics and screen shots to aid communication between DOHMH's team and MUSC's team, and were edited to accurately match the screen in instances where the application had been changed during the original research but the scripts had not been accordingly updated.

The text in the final scripts was aligned with DOHMH's program messages, had accurate branching logic, and corrected grammar, spelling, punctuation and capitalization. In order to improve readability/usability, we also removed or replaced passages that we believed were unnecessary (e.g., streamlining examples, removing extraneous descriptions).

Due to resource allocation for this project, there were some aspects of customization in which we gave guidelines for changes, and requested that MUSC determine the specifics. For example, we asked for a reduction in word count for many of the text-heavy pages, but did not rewrite the passages; we asked for more racial, ethnic, and age diversity in the images, but did not supply the photos.

Stage 2: Updating the application

MUSC was able to make edits within three weeks, and returned the scripts to us with their comments on any changes that could not be made. Edits that were not made fell into two categories: lack of resources and ideological objections.

Lack of resources drove the inability to create a working "back" button. The platform that Bounce Back was originally created on did not support that functionality; only a change in platform could address that. Changing the platform would require complete re-programming of the application, which was far beyond the resources available for this project. MUSC investigated the possibility of disabling the "back" button on the browser to at least avoid the user inadvertently experiencing incorrect branching, but that, too, was beyond the resources of the project. Instead, on the registration page, we inserted language explaining the functionality and limitations of the application. The same limitations of the platform were also the determining factors in not being able to create a navigation bar to allow the user to skip ahead within a module.

Our request to reduce the number of pages and the amount of text on many of the pages was met with ideological objections. MUSC's researchers who wrote the original scripts were adamant that it was critical to the integrity of the product that all of the scientific evidence and explanation remain in the modules. We believed that while it was important, the general public (as opposed to research subjects) would lose interest due to the length and density, and fail to complete the modules. Ultimately, because we did not have the resources to rewrite the pages ourselves to use as a starting point for negotiation, almost all of the pages remained in the modules, and many of them stayed over 400 words.

Stage 3: Testing and demonstration

Our testing found that almost all of the requested and agreed-upon edits were accurately made; there were a few omissions that MUSC immediately corrected. The branching logic was corrected whenever possible. The subsequent demonstration of the revamped application for senior staff was met with mixed results. The general consensus was that, though the customization process had improved the application and it better reflected the DOHMH's programmatic messages, it was not sophisticated or user-friendly enough to brand with our name and promote as our product.

Senior staff found several major problems with the application – its length (the number of pages of information and questions before the user gets to the tools/exercises and completes the module), the density of the text, the lack of functionality with no "back" button, and most importantly, the navigation (no navigation bar to allow the user to skip around in the module).

The project team and senior staff were aware that addressing these major problems was not a possibility given the resources that had been allocated to the project. We proposed de-branding the application, and posting a link to it as one of several external resources on DOHMH's website, but not dedicating further resources to promoting or maintaining it. Senior staff considered this proposal, but ultimately decided against it; they felt that without a comprehensive comparison of Bounce Back to all of the other similar applications available, it would not be appropriate to passively endorse it. Ultimately, the decision was made to abandon the project.

Discussion

The objective of this project was to customize and launch an internet-based mental health intervention to address the mental health needs of New Yorkers exposed to Hurricane Sandy. Though the customization and beta testing process made a substantial amount of progress toward that goal, ultimately the fundamental problems with the application proved to be insurmountable, and we were not able to create a product that we believed would effectively serve New Yorkers or communicate the public health messages of the Agency.

Previous research has shown that an intervention's implementation is a key influence on the outcome of a project.[16] A five-factor framework of implementation variables that contribute to the success of a project has been identified: community, providers, innovation, delivery system, and support system (figure 2).[16] Community-level factors encompass the outer setting and sociocultural context in which the project is embedded, and in the case of Bounce Back would include New York City, the aftermath of Hurricane Sandy, population-wide mental health care access, and population-wide internet access.[16,17] Provider-level characteristics are the skills and perceptions of anyone who is in contact with a patient to deliver an intervention; though Bounce Back would be delivered by the internet and not a human being, these provider-level characteristics would be most relevant in the individuals who created the content of the application.[16,17] Innovation characteristics related to implementation are adaptability and compatibility – that the program can be modified to fit the needs of the community and that the program fits within the organization's mission and priorities.[16] The delivery system includes organizational capacity, including leadership effectiveness, shared decision-making, and employee morale. The support system includes technical assistance and provider training.[16,17]

Using this framework in an analysis of Bounce Back, we found that innovation factors and delivery system factors were ultimately responsible for its failure (figure 2). Innovation characteristics that would have allowed for necessary customization were absent from the beginning. The key problems with the application, namely poor navigation, length and density, were well-known at the initiation of the project, and may have been able to be addressed with appropriate resources for customization. However, it's important to recognize that the urgency to provide widely available, low-cost mental health services after Hurricane Sandy initially (and reasonably) overshadowed the limitations of the application. Once the immediacy of the disaster had passed, the significance of these limitations couldn't be avoided and drove the decision to terminate the project.

The delivery system factor that most contributed to the project's lack of success was primarily the decision-making process of selecting this application. In hindsight, it appears that the only way to have altered the course of this project would have been to have chosen another application from the outset. In the face of the urgency of disaster response, the best solution would have been to have carefully evaluated all of the available applications, and then chosen, customized, and tested one in advance of the event; any necessary modifications to reflect the specifics of Hurricane Sandy could have been made quickly in the days following, and the application could have launched within a few weeks.

In order to choose the most appropriate product, we recommend preparing clear evaluation standards in advance of a review, and reaching a consensus among senior leadership as to the content of those

standards. It is also imperative to avoid evaluation and review of a product in the immediate aftermath of a disaster; such review and evaluation can be done more thoroughly and thoughtfully when the Agency is not in disaster-response mode.

It may be impractical, however, to dedicate resources to creating an internet-based mental health intervention that would not be used until another natural or man-made disaster strikes New York City. Though the events of the last several decades and climate-change weather predictions indicate that a similar event may be in the foreseeable future, the Agency could use the same evaluation, review, and customization process to create an internet-based mental health intervention that is not specific to disaster recovery, and instead promotes mental health and wellness in the general New York City population throughout the lifecycle. Indeed, research has shown that mental health wellbeing is a protective factor and promotes resiliency in the face of tragedy[18]. An application that is designed for use during "business-as-usual" time, with an added module for disaster-response to be used if needed in the wake of a disaster would be valuable product to promote mental health throughout the City.

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Tables/Graphs

Figure 1. Logic Model



Input	Process	Output	Outcome
•DOHMH mission •Division of Mental Hygiene mission •Hurricane Sandy •Disaster-response peer-reviewed literature •Depression, anxiety, alcohol abuse, tobacco, and PTSD peer-reviewed literature •HIT peer-reviewed literature •Original Bounce Back application •Original Bounce Back scripts •DOHMH Bureau of Mental Health staff time and expertise •DOHMH Bureau of Children, Youth and Families staff time and expertise •DOHMH Bureau of Alcohol and Drug Use staff time and expertise •DOHMH Bureau of Tobacco Control staff time and expertise •DOHMH Division of Information Technology staff time and expertise •DOHMH Division of Communications and Marketing staff time and expertise •DOHMH Office of The Executive Deputy Commissioner staff time and expertise •MUSC project staff time and expertise	•Development of evaluation and selection criteria for potential application •Use of selection and evaluation criteria to choose application •Buy-in from leadership on use of selected application •Content customization •Script revisions •Programming changes to application •Testing branching logic and ensuring accuracy of updates •Programming fixes •Demonstration for senior staff •Additional content customization •Pilot testing by community users •Development of marketing plan •Approval of marketing plan •Development of data-analysis plan •Development of evaluation plan •Launch of application •Data collection •Application maintenance	•Customized, accurate scripts •Revamped, user-friendly application with five modules customized for NYC population •Marketing campaign •Application go-live •User data	•Improved user mental health •Reduced incidence of depression, alcohol use, tobacco use, PTSD and panic among users after using modules •Improved application (through user data analysis) •Increased ability and resources for mental health self-management among users

Figure 2. Framework for Effective Implementation [16]

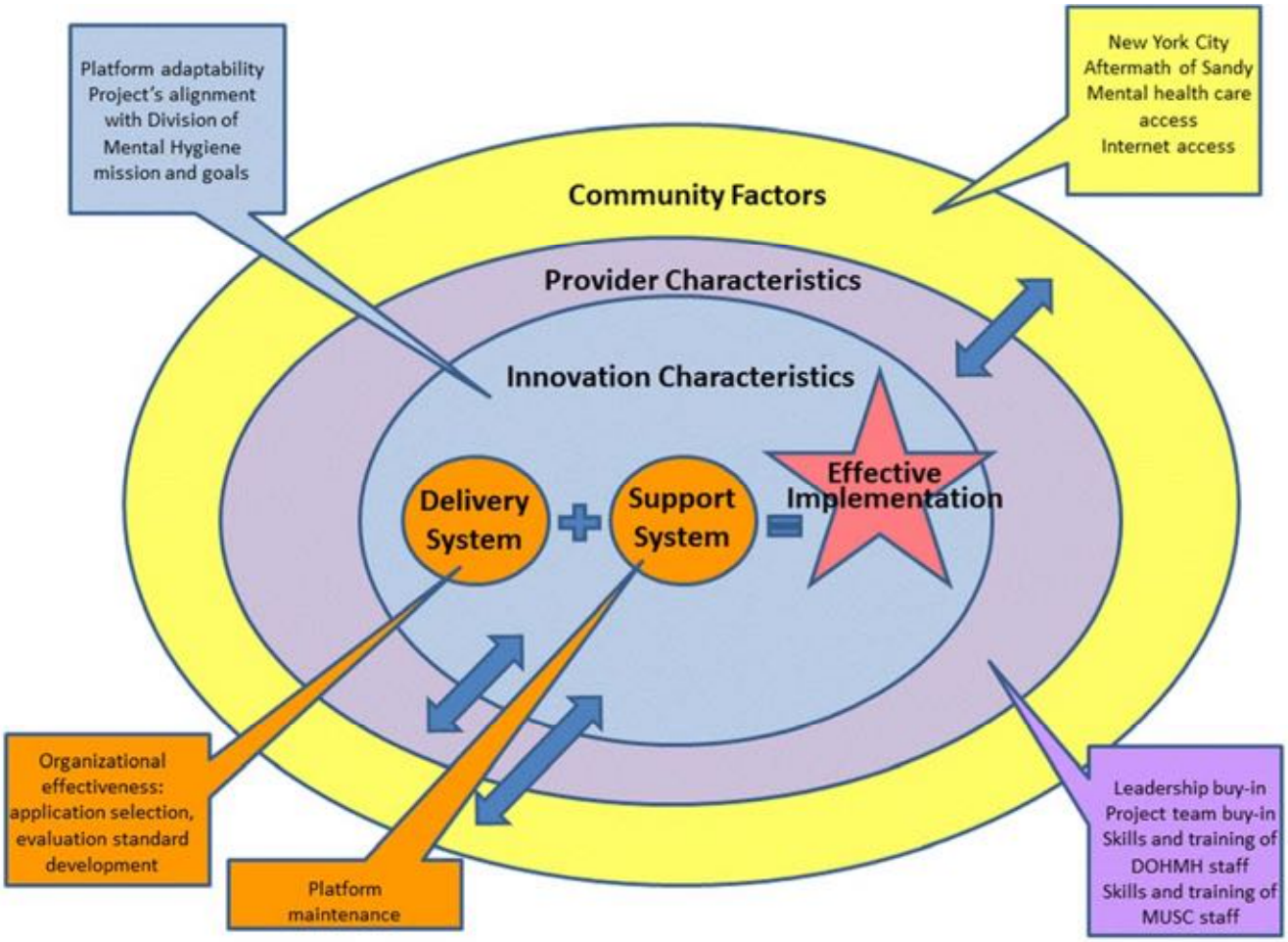

Figure 3. Projected Timeline

(Note: Timeline describes projected schedule at project's initiation; red arrow indicates point at which the project was terminated)

October 29, 2012	Hurricane Sandy makes landfall in New York City
November 2012	Bounce Back selected to use as disaster-response mental health self-management application
December 1, 2012	Customization of scripts and branching analysis begins
December 21, 2012	Customization and branching analysis complete, begin updating application
January 2, 2013	Create marketing campaign
January 15, 2013	Updating complete Beta testing begins
January 22, 2013	Second round of updating begins
January 30, 2013	Second round of updating complete
February 1, 2013	Demonstration for senior leadership (updating continues until February 15, 2013)
Project terminated →	*Implement marketing campaign*
February 3, 2013	*Demonstration for Agency staff, soft launch*
February 15, 2013	*Full launch* *Begin data collection* *Monitor and fix bugs*
March 2013	*Develop initial data analysis plan*
April 2013	*Begin monthly data analysis*
August 2013	*Release version 2.0, as needed*
October 15, 2013	*Begin second marketing campaign in lead-up to anniversary of Sandy*

Capstone Response Letter to Reviewer

Dear Professor Wyka,

Thank you for your review of this capstone paper and the thoughtful comments you have provided. In response to your comments, we have made the following changes:

1. The scope of the problem section would benefit from adding information about mental health needs in the wake of disaster. Consider rewriting middle of 2nd paragraph in Introduction. (page 4, paragraph 2)
   We have added additional information about elevated risk of developing mental health-related issues after exposure to traumatic event.

2. Consider moving this information (end of 2nd paragraph in Introduction, about access) to the next paragraph where you talk about access to mental health care. (page 4, paragraph 2/3)
   We have moved the information about access to mental health care for vulnerable populations to the end of following paragraph, which discusses other barriers to care.

3. Describe findings from research on the use of HIT following disaster. (page 5, paragraph 1)
   We have added a statement that while the research on using HIT for mental health following a disaster is limited, the evidence that does exist has shown promise in promoting positive mental health outcomes. We have added references that support this statement.

4. Include summary of what will be covered in the paper, in the last paragraph of the Project description section. (page 8, paragraph 4)
   We have added a brief summary of in the paper to the Project Description section.

5. Add clarity about Student's role in the project. (page 8, paragraph 4)
   Within the summary of the paper, we have added a statement about the author's role in the project.

6. Reference graphs and figures in the text. (page 14, paragraph 3)
   We added a reference to the Framework for Effective Implementation figure in the Discussion section where the framework is discussed.

7. Project timeline in confusing – was the application finally launched? (page 18)
   The project was not launched. We have added a note under the heading indicating that the timeline describes the projected schedule at project's initiation. We have also added a graphic on the timeline at the point at which the project was terminated, and gray-scaled and italicized the font of events beyond that date to indicate their unfulfillment.

8. Correct spelling and grammar. (throughout)
   We have corrected the spelling and grammar errors that were noted in track changes, including changing "excluding" to "which may exclude"; "~" to "about"; hyphens to commas as appropriate; removing "for us"; adding (IT) to follow the first time the acronym is spelled out; and added "Sandy" to a mention of "the Hurricane" for clarity.

9. Minor revisions for appropriate language for scientific writing. (throughout)
   We have revised the language as suggested, changing "work" to "purpose"; "we" to "the team"; "be bored" to "lose interest due to…"; "quickly" to "immediately"; and "not-too-distant" to "foreseeable".

Thank you again,
And kind regards,

Introduction

Commented [BP1]: Needs citations

The burden of disease resulting from exposure to toxic pollution continues to be an overlooked contributor to the global burden of disease. While elements such as arsenic may occur naturally in the environment and negatively impact our health, small- and large-scale industrial processes concentrate these elements in and around the places we live. Whether it is the use of lead in artisanal ceramic workshops or chromium steel manufacturing or leather tannery operations, these pollutants have many routes of exposure that present a risk toward human health. These pollutants find their way into the soil in and around homes, into sources of water, onto the clothes of workers and into the homes of their families.

Commented [BP2]: Provide some more background- how many people are exposed in developing countries. What is the burden of disease

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As public health officials, governments and communities in low- and middle-income countries continue to face numerous public health threats from pollution with limited resources, the value of quantifying and prioritizing these threats increases. More recently, attempts have been made to more accurately quantify risk factors contributing to health loss amongst a population, represented both by physical and mental disability or a loss in quality or length of life. [1] Summary measures may then be used during the policymaking process to discern what public health threats are of greatest concern, and furthermore, what policies and interventions are most effective. [1]

Known health effects from exposure to heavy metals

Arsenic is a naturally occurring element found in ores containing metals such as copper and lead. Its release into the environment from the sites investigated resulted from tailings from mining operations and smelting processes. Exposure to arsenic may result in

skin rashes, a decrease in red and white blood cell production, and in extreme cases, death.

Lead (Pb) is a heavy metal and powerful neurotoxin that occurs naturally in the environment. Its release into the environment from the sites investigated resulted from lead smelting, mining, used lead-acid battery (ULAB) recycling and as a glaze for ceramic pottery. Exposure to lead may occur through inhalation of contaminated air, ingestion of contaminated soil, water or food and through dermal contact. The resulting health effects include neurological damage, IQ decrement and hypertension, resulting in an increase incidence of cardiovascular disease.

Chromium (Cr) is a naturally occurring heavy metal found in the earth's crust. Its most common uses at the sites investigated included steel manufacturing and leather tannery operations. Depending on its route of exposure, chromium can cause respiratory and gastrointestinal system damage, and is a known carcinogen.

Now put in the goals of your study

Methods

Site identification

Environmental and biological exposure data was obtained from the ~~A~~ Toxic Sites Identification Program ~~database~~ (TSIP), ~~was created by~~ a joint project between Pure Earth and the United Nations Development Organization. The TSIP identifies hazardous waste released from active and former industrial sites in low- and middle-income countries. The TSIP does not include exposure data from non-point sources such as vehicle traffic and sewage contaminated water. ~~a non-governmental organization dedicated to combatting toxic pollution in low- and middle-income countries. This~~

~~database contains environmental and biological sample data corresponding to known hazardous waste sites~~ .

~~This study used data collected in the Latin American countries of~~ Three specific countries were identified for analysis, Argentina, Mexico and Uruguay. In order for a hazardous waste site to be included in the analysis some marker of exposure, either biological or environmental, needed to be available. ~~Only sites containing environmental or biological samples referencing potential exposure to heavy metals were included in this study~~. A site's inclusion into the study -was ~~additionally~~ also dependent on the availability of the following data points: the site's location, a description of the activities suspected of contributing to environmental contamination, a completed exposure pathway, and ~~an accurate~~ an estimate of the potentially affected population. ~~, and an environmental exposure measurement.~~

Using these criteria t~~T~~he TSIP database ~~was found to~~ contained 74 fully completed site surveys in Mexico, 37 in Argentina and 52 sites in Uruguay with a total a of 446 data samples that met the study criteria. ~~Only sites containing environmental or biological samples referencing potential exposure to heavy metals were included in this study. A site's inclusion into the study was additionally dependent on the availability of the following data points: the site's location, a description of the activities suspected of contributing to environmental contamination, a completed exposure pathway, an accurate estimate of the potentially affected population, and an environmental exposure measurement.~~

~~Sampling Guidelines~~Exposure Assessment

Commented [BP3]: Discuss why you chose these countries

Commented [BP4]: What does this mean

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Commented [BP6]: What do you mean by samples

Environmental and biological samples were collected by site investigators in the field. ~~The three heavy metal contaminants of concern at these sites included arsenic, lead and chromium~~. The residents'~~-~~ arsenic and chromium exposure was estimated by soil or water samples (n=?); while resident's lead exposure was estimated through blood lead levels (BLL) (n=?) or soil concentrations (n=?). Multiple ~~E~~environmental media and exposure routes were considered and sampled ~~in~~ at sites suspected of arsenic or chromium contamination. This included soil in both industrial and residential areas ~~measured in milligrams per kilogram~~ (mg/kg)~~,~~and water used for crop irrigation~~,~~ ~~and~~ bathing, and drinking ~~measured in micrograms per liter (µu~~g/l)~~, as well as water used for drinking (ug/l).~~ As most disability associated with chromium exposure is caused by hexavalent chromium, a speciation coefficient of 0.6 was used to estimate hexavalent chromium levels where only the total chromium value was reported. [1]

~~Residential, agricultural and industrial areas~~ ~~When possible, blood lead level samples measured in micrograms per deciliter (ug/dL) were taken from voluntary residents in areas suspected of lead contamination.~~ ~~suspected of lead contamination were represented by both environmental and biological samples.~~ In areas suspected of lead contamination, ~~blood lead levels~~BLLs were prioritized ~~in this data analysis as~~since they ~~may be used to directly to estimate health outcomes~~are more representative of human exposure. When biological samples had a sample size of less than five, environmental sample data, such as lead in soil ~~(mg/kg)~~ were used to calculate ~~estimate the~~ burden of disease estimates. ~~Environmental samples for lead were measured in mg/kg~~. ~~When possible, blood lead level samples measured in micrograms per deciliter (ug/dL) were taken from voluntary residents in areas suspected of lead contamination.~~

~~In areas suspected of lead contamination, blood lead levels were prioritized in this data analysis as they may be used to directly to estimate health outcomes. When biological samples had a sample size of less than five, environmental sample data, such as lead in soil (mg/kg) were used to estimate the burden of disease. As most disability associated with chromium exposure is caused by hexavalent chromium, a speciation coefficient of 0.6 was used to estimate hexavalent chromium levels where only the total chromium value was reported.~~[1]

Population ~~at risk of exposure~~estimates and age distrunution

It has been well documented that children are more susceptible to negative health effects caused ~~brought on~~ by exposure to toxic pollution. ~~For this reason~~Therefore, an age distribution of the population must be used when calculating the burden of disease ~~resulting from exposure to heavy metals~~. ~~As~~Since an age distribution was not recorded as part of Pure Earth's protocol, a country-specific age distributions generated by the U.S. Census Bureau were used in disease estimates.[4,8] .

In order to determine the number of people affected by the hazardous waste site a half-mile radius was drawn around the site. This radius was based on input from local site investigators and aerial photography. Anyone residing within that area was considered potentially exposed to the site and estimates of the number of individuals living within a half-mile of the facility was ascertained from local community members. Age distributions and population counts were then paired to determine the number of individuals within each category. ~~The database often presented data in geographical sectors, pairing an environmental or biological sample with a subset of the population for each site. The estimate of the population affected by pollution was assumed to reside~~

Commented [BP7]: This needs citations

Commented [BP8]: Insert the age categories

~~within a half-mile of the investigated sites, based on input from local site investigators aerial photography.~~

~~Calculating risk per person~~Risk estimates

Risk was calculated for both cancerous and non-cancerous health endpoints due ~~to~~ to toxicology of the metals ~~arsenic or chromium exposure~~.[4] The United States Environmental Protection Agency's (U.S. EPA) Regional Screening Level Calculator for Chemical Contaminants was used to calculate long-term cancer risk per unit toxicant.[4,9] The U.S. EPA's Integrated Risk Information System database contains reference doses (RfDs) and reference concentrations (RfCs) for non-cancer health effects that were applied to each sites suspected exposure pathway and sampled pollutant concentration.[10] A linear dose response was assumed using the relevant RfD or RfC.[4] Disease incidence and burden for lead was calculated using the U.S. EPA's Integrated Exposure, Uptake and Biokinetic (IEUBK) model and tools developed by WHO.

~~Calculating i~~Incidence of disease

The incidence of disease resulting from exposure to arsenic and chromium was calculated by multiplying the risk per person by the quantity of contaminant found.[11] For environmental lead samples, blood lead levels were first estimated using the U.S. EPA's IEUBK model. Ingestion of levels of lead through soil and drinking water were assumed to be similar to those found in indigenous populations. Disease incidence and disability-adjusted life years~~DALYs~~ resulting from measured blood lead level samples and estimated blood lead levels were calculated separately using spreadsheets created by the WHO.[12] Using these spreadsheets, both incidence of mild mental retardation (MMR) and anemia in children and cardiovascular disease in adults was calculated for lead.[4]

Commented [BP9]: Make a citation to what estimates you used

As the linear slope factors used to calculate incidence can result in overestimates of disease incidence, namely for chromium, incidence for all disease was capped at 5%.[4]

Burden of disease calculation

~~This study used a~~ The disability-adjusted life years (DALY) ~~calculator~~ metric, previously ~~created by~~ described by ~~-~~Chatham-Stephens et al.[4], was used to quantify the burden of disease on caused by exposure to pollutants. ~~Burden of disease has previously been expressed through a metric known as disability-adjusted life years (DALYs).[2]~~ The DALY is a time-based measure of health that combines indices of ~~computed values for both~~ years lived with disability (YLD) and years of life lost (YLL). YLD and YLL were calculated based on exposure estimates collected in the field. YLD is the product of years lived with a disability and ~~Previous studies have utilized~~a specific disability weights~~-~~ (DW)~~. calculated by the WHO for a variety of chemicals and exposure routes in order to determine a burden of disease expressed as both YLD and YLL.~~ A DW is scaled between zero and one; with zero representing perfect health and one represented the worst possible state of health.[3] ~~This study used a DALY calculator previously created by Chatham-Stephens et al.[4]~~

In order to calculate YLD and YLL, each heavy metal was assigned both the relevant type of cancer or noncancer health effect and corresponding DW.[4] Years lived with disability (YLD) resulted from an estimation of years lived multiplied by the disability weight appropriate for the exposure scenario.[4] Years of life lost (YLL) were calculated only for carcinogens[4]; as a result, lead exposure did not contribute to YLL. Cancer incidence in each country by age group was calculated with data from the WHO

International Agency for Research on Cancer (IARC) Mortality Database. In conjunction with survival data, these cancer incidence distributions were used to calculate deaths, represented by YLL.[4]

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Disability-adjusted life years (DALYs) resulting from cardiovascular disease were transformed into percentages to show a distribution across age groups for each country using the WHO's Global Health Estimates Summary Tables.[5] The percentage of DALYs attributable to ischemic heart disease, cerebrovascular disease, hypertensive disease and all other cardiac diseases were calculated for each country individually. By using BLLs and this percentage of DALYs attributable to cardiovascular disease in a WHO spreadsheet, DALYs attributable to lead exposure were calculated.[4,6]

Weighting factors, along with a discount rate, were applied to both YLD and YLL to provide a range of DALY estimates accounting for variances in the value of different age groups, as well as the uncertainty in predicting future exposure.[4, 7] Both the age weights and discount rates are signified in the notation $DALYs_{(r,K)}$, where r is the discount rate and K is the age weight used. DALYs were calculated separately for each pollutant at sites, as coexposures can lead to an increase or decrease of health effects resulting from synergistic or antagonistic effects.[4]

~~***Population at risk of exposure***~~

~~It has been well documented that children are more susceptible to negative health effects brought on by exposure to toxic pollution. For this reason, an age distribution of the population must be used when calculating the burden of disease resulting from exposure to heavy metals. As age distribution was not recorded as part of Pure Earth's protocol, country-specific age distributions generated by the U.S. Census Bureau were~~

used.[4, 8] The database often presented data in geographical sectors, pairing an environmental or biological sample with a subset of the population for each site. The estimate of the population affected by pollution was assumed to reside within a half-mile of the investigated sites, based on input from local site investigators aerial photography.

Calculating risk per person

Risk was calculated for both cancerous and non-cancerous health endpoints due to arsenic or chromium exposure.[4] The United States Environmental Protection Agency's (U.S. EPA) Regional Screening Level Calculator for Chemical Contaminants was used to calculate long-term cancer risk per unit toxicant.[4, 9] The U.S. EPA's Integrated Risk Information System database contains reference doses (RfDs) and reference concentrations (RfCs) for noncancer health effects that were applied to each sites suspected exposure pathway and sampled pollutant concentration.[10] A linear dose response was assumed using the relevant RfD or RfC.[4] Disease incidence and burden for lead was calculated using the U.S. EPA's Integrated Exposure, Uptake and Biokinetic (IEUBK) model and tools developed by WHO.

Calculating incidence of disease

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~~As the linear slope factors used to calculate incidence can result in overestimates of disease incidence, namely for chromium, incidence for all disease was capped at 5%.~~[4]

Sensitivity Analysis

A range of estimates was also created through a sensitivity analysis by adjusting the population at risk, as well as changing the disease incidence cap from 5% to 2.5%. The average DALY per person found for the screened sites was applied to unscreened sites.

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Burden of Disease Resulting from Heavy Metals Exposure at Toxic Waste Sites in Argentina, Mexico and Uruguay
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Abstract

Background: Calculations estimating the burden of disease from toxic exposures have previously accounted for exposure to only one pollutant per site.

Objective: Using a disability-adjusted life year (DALY)-based method previously created by Chatham-Stephens et al., we estimated the burden of disease resulting from exposure to arsenic, lead and hexavalent chromium in toxic waste sites in three low- and middle-income countries (LMICs).

Methods: Toxic waste sites identified through Pure Earth's Toxic Sites Identification Program (TSIP) were screened for one of three heavy metals found in both biological and environmental media. An estimate of DALYs for each population thought to be at risk was generated.

Results: Approximately 508,422 persons in three countries were at risk of exposure to pollutants in 160 unique sites identified through TSIP. Exposure to pollution was estimated to result in 47,293 – 104,924 DALYs.

Conclusions: The burden of disease estimate for exposure to three heavy metals in three low- and middle-income countries is comparable with myriad public health threats, and may be used as a tool to generate support and funding for the remediation of toxic waste sites.

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Introduction

Environmental exposure to pollution from hazardous waste sites continues to be an overlooked contributor to the global burden of disease.[1] Continuing industrial development, urbanization and socioeconomic forces in Latin America have contributed to increases in environmental pollution and the negative health effects resulting from exposure.[2] In order to quantify the health impacts caused by toxic waste, researchers have used the disability-adjusted life year (DALY) metric, which takes into consideration the burden of disease resulting from illness, injury and death.[3] A previous study by Prüss-Ustün estimated that exposure to various chemicals accounts for 5.7% of total global DALYs and 8.3% of global deaths.[4] Another study estimated that 0.22% of the total estimated DALYs from all causes in India, Indonesia and the Philippines were attributed to pollutants found at hazardous waste sites.[5]

It is estimated that 94% of the burden of disease resulting from pollution falls on LMICs with limited resources to remediate the problem. As the global community has made significant progress in eliminating the burden of illness caused by non-communicable disease, chronic illness continues to affect a greater population. Chronic illnesses are often linked to exposure to environmental threats, including: cardiovascular disease, neurodevelopmental disorders and cancer.[12] Efforts to lessen the burden of disease in LMICs due to chronic illness must include interventions to reduce exposure to toxic pollution.

As public health officials, governments and communities in LMICs continue to face numerous public health threats from pollution with limited resources, quantifying and prioritizing pollution problems becomes increasingly valuable. Recently, attempts

have been made to more accurately quantify risk factors contributing to health loss amongst a population, represented both by physical and mental disability or a loss in quality or length of life. Summary measures may then be used during the policymaking process to discern what public health threats are of greatest concern, and furthermore, what policies and interventions are most effective. [6]

In developing countries, heavy metals are still widely used in the production of consumer goods. Inadequate pollution controls and improper disposal can expose populations living near manufacturing and disposal sites. Three metals of particular concern in developing countries include arsenic, lead and chromium. Although the risk of disease resulting from exposure to these metals is widely known, widespread use continues. Lead is still used in manufacturing artisanal ceramics, while chromium is used in waste incineration and leather tanning, despite less hazardous alternatives. Over time contaminants can migrate from these sites into residential and agricultural soil and water exposing populations living near these sites.

Arsenic is a naturally occurring element found in metal ores. It is released into the environment from improper disposal of mine tailings and during metal smelting. Arsenic exposure may lead to the development of arsenicosis, a disabling and disfiguring ailment, as well as the occurrence of both internal cancers, skin cancers, diabetes, high blood pressure, respiratory, circulatory and reproductive disorders. [7] Exposure to arsenic may also result in skin rashes, a decrease in red and white blood cell production, and in extreme cases, death. Arsenic may also find its way into the body through ingestion of crops irrigated with contaminated water. [8]

The hazards of lead have been known for centuries, yet it is still used in an number of industrial processes. Anthropogenic sources of lead in the environment include smelting, mining, used lead-acid battery (ULAB) recycling and ceramic pottery glaze. Lead is a potent neurotoxin and can cause neurological damage, IQ decrement and hypertension, causing an increase incidence of cardiovascular disease. Additionally, lead may have a severe effect on visuospatial skills, and has even been linked to antisocial behavior if exposure occurs too early in development. [9] Acute or chronic exposure to lead is also of grave concern to pregnant women, as lead may be transferred through the placenta to the fetus. [9]

Despite negative health effects resulting from exposure, chromium continues to be used in leather tanning, metal processing and stainless steel welding operations. Adverse health effects resulting from chromium exposure differ depending on the route of exposure and the form of chromium involved. Hexavalent chromium poses greater health risks due to its higher toxicity and associated cellular uptake pathways. [10] When inhaled, chromium is known to cause respiratory damage, while ingestion of contaminated soil particles may lead to gastrointestinal system damage with recent studies showing hexavalent chromium to be a stomach carcinogen in humans. [11]

Previous studies that have investigated the health effects from living in close proximity to hazardous waste sites have generally only accounted for one pollutant per site. [5] However, toxic waste sites often contain multiple pollutants that pose unique health threats. This research aims to accurately quantify the burden of disease caused by one or more known pollutants found at toxic waste sites in Argentina, Mexico and Uruguay. The resulting analysis aims to provide a basis for public health intervention and

environmental remediation at both the national and regional level, as well as to inform strategies for continued site investigation of contaminated sites.

Methods

Site identification

Environmental and biological exposure data was obtained from the Toxic Sites Identification Program (TSIP), a project carried out by the New York-based non-profit Pure Earth and funded jointly by the United Nations Industrial Development Organization (UNIDO) and the European Commission (EC). The TSIP identifies both active and legacy hazardous waste sites resulting from industrial and informal activities in LMICs. A majority of the locations screened are abandoned (legacy) sites, including former tanneries and small-scale artisanal sources such as ULAB recycling and artisanal gold mining.[5] The TSIP does not include exposure data from non-point sources such as vehicle traffic and sewage contaminated water. Heavy metals are often the key pollutant of concern, exposing the population via the water supply, contact or ingestion of contaminated soils or through inhalation of contaminated air.[13] Three countries were identified for this analysis: Argentina, Mexico and Uruguay. These countries were chosen due to the quality and availability of data in the TSIP database. In order for a hazardous waste site to be included in the analysis, a credible exposure pathway and a biological or environmental sample had to be present. A site's inclusion into the study was also dependent on the availability of the following information: the site's location represented by GPS coordinates, a description of the activities suspected of contributing to the contamination at the site, a completed exposure pathway and an estimate of the potentially affected population. Using these criteria the TSIP database contained 74

completed site surveys in Mexico, 36 in Argentina and 50 sites in Uruguay, representing 160 sites analyzed with data including one or more of total a 394 environmental or biological samples. These sites represent a fraction of those found in these countries; therefore DALY estimates are representative of screened sites only.

Exposure Assessment

Site investigators in the field collected environmental and biological samples. Exposure pathways in the analysis included the inhalation of dust and ingestion of soil for all three heavy metals (n=389), while arsenic and chromium had additional pathways resulting from the ingestion of water via drinking, bathing, washing or irrigation practices (n=5). The residents' arsenic and chromium exposure was estimated by soil or water samples (n=155) while resident's lead exposure was estimated through blood lead levels (BLL) (n=75) or soil concentrations (n=164). Multiple environmental media and exposure routes were considered and sampled at sites suspected of arsenic or chromium contamination. This included soil in both industrial, residential and agricultural areas (mg/kg) and water used for crop irrigation, bathing, and drinking (µg/l). Chromium in soil values were reported as total chromium values and hexavalent chromium (Cr VI) values, the form of chromium most often associated with causing death and disability. As total chromium values may include less harmful forms such as trivalent chromium (Cr III), a speciation coefficient of 0.6 was used to estimate Cr VI levels where only total chromium was reported. [14] In areas suspected of lead contamination, BLLs were prioritized, as they are the standard marker of human exposure. Blood samples were tested using a Lead Care II analyzer (Magellan Diagnostics, MA USA) onsite or sent to a

local laboratory for analysis. [15] The U.S. Centers for Disease Control and Prevention (CDC) sets an upper limit of 5 μg/dL for children under the age of 6 years. [16] Table 1 depicts the range and average BLLs found in countries where blood lead level data was available. When biological samples had a sample size of less than five, environmental sample data, such as lead in soil were used to calculate burden of disease estimates.

Population estimates and age distribution

It has been well documented that children are more susceptible to negative health effects caused by exposure to toxic pollution. [17] Hazardous chemicals are absorbed and inhaled into the body of children at a much higher rate than adults. Furthermore, toxicants can affect children during their 'critical windows of development', when their bodies and minds are most at risk. Children also have different behaviors than adults; they are lower to the ground and tend to have more unwashed hand to mouth contact than adults. Therefore, an age distribution of the population must be used when calculating the burden of disease. As age distribution was not recorded as part of Pure Earth's TSIP protocol, country-specific age distributions generated by the U.S. Census Bureau were used in disease estimates. [5] [18]

In order to determine the number of people affected by each hazardous waste site, a half-mile radius was drawn around the site. A half-mile was chosen due to the relatively low mobility of heavy metals in soil. The exact location of each site was based on input from local site investigators and confirmed via satellite imagery. Anyone residing within that area was considered potentially exposed to the site and estimates of the number of individuals living within a half-mile of the facility was ascertained from local community

members. Age distributions and population counts were then paired to determine the number of individuals within each age category.

Risk estimates

Risk was calculated for both carcinogenic and non-carcinogenic health endpoints due to toxicology of the metals. [5]The United States Environmental Protection Agency's (USEPA) Regional Screening Level Calculator for Chemical Contaminants was used to calculate long-term cancer risk per unit toxicant. [5, 19] The USEPA's Integrated Risk Information System database contains reference doses (RfDs) and reference concentrations (RfCs) for non-cancer health effects that were applied to each sites suspected exposure pathway and sampled pollutant concentration (Table 1). [20]A linear dose response was assumed using the relevant RfD or RfC. [5] However, disease incidence and burden for lead was calculated separately using the USEPA's Integrated Exposure, Uptake and Biokinetic (IEUBK) model and tools developed by the World Health Organization (WHO). The IEUBK model is used to estimate BLLs in children resulting from exposure through soil, air, water, diet and maternal blood lead concentrations. [15] Blood lead levels were extrapolated for adults using the USEPA's Adult Lead Methodology (ALM). [21]

Incidence of disease

The incidence of disease resulting from exposure to arsenic and chromium was calculated by multiplying the risk per person by the level of contaminant found in each medium. [22] For environmental lead samples, blood lead levels were first estimated using

the US EPA's IEUBK model. Ingestion of levels of lead through soil and drinking water were assumed to be similar to those found in indigenous populations.[23,24] Disease incidence and disability-adjusted life years resulting from measured blood lead level samples and estimated blood lead levels were calculated separately using spreadsheets created by the WHO.[25] Using these spreadsheets, both incidence of mild mental retardation (MMR) and anemia in children and cardiovascular disease in adults was calculated for lead.[5]As the linear slope factors used to calculate incidence are largely based on animal testing, disease burden may be overestimated. Therefore, incidence for all disease was capped at 5%.[5]

Burden of disease calculation

The DALY is a time-based measure of health that combines indices of years lived with disability (YLD) and years of life lost (YLL). YLD and YLL were calculated based on exposure estimates collected in the field. YLD is the product of years lived with a disability and a specific disability weight (DW). A DW is scaled between zero and one; with zero representing perfect health and one represented the worst possible state of health.[26] For example, mild mental retardation attributable to lead exposure has a DW of .361.

In order to calculate YLD and YLL, each heavy metal was assigned both the relevant type of cancer or noncancer health effect and corresponding DW.[5] Years lived with disability (YLD) resulted from an estimation of years lived multiplied by the disability weight appropriate for the exposure scenario.[5] Years of life lost (YLL) were calculated only for carcinogens; as a result, lead exposure did not contribute to YLL. This

seems to be the standard route for calculating lead induced MMR, as lead exposure very rarely results in death. Cancer incidence in each country by age group was calculated with data from the WHO International Agency for Research on Cancer (IARC) Mortality Database. In conjunction with survival data, these cancer incidence distributions were used to calculate deaths, represented by YLL.

Disability-adjusted life years (DALYs) resulting from cardiovascular disease were transformed into percentages to show a distribution across age groups for each country using the WHO's Global Health Estimates Summary Tables.[27] The percentage of DALYs attributable to ischemic heart disease, cerebrovascular disease, hypertensive disease and all other cardiac diseases were calculated for each country individually. By using BLLs and this percentage of DALYs attributable to cardiovascular disease in a WHO spreadsheet, DALYs attributable to lead exposure were calculated.[5,28]

Weighting factors, along with a discount rate, were applied to both YLD and YLL to provide a range of DALY estimates accounting for variances in the value of different age groups, as well as the uncertainty in predicting future exposure.[5, 29] Both the age weights and discount rates are signified in the notation $DALYs_{(r,K)}$, where r is the discount rate and K is the age weight used. Results expressed as $DALYs_{(3,1)}$ represent a 3% discount rate and full age weighting, while those expressed as $DALYs_{(3,0)}$ include only the discount rate. $DALYs_{(0,0)}$ represent a burden of disease estimate without weighting. DALYs were calculated separately for each pollutant at sites, as co-exposures can alter health effects resulting from synergistic or antagonistic effects.[5]

Sensitivity Analysis

A range of estimates was also created through a sensitivity analysis by adjusting the population at risk, as well as changing the disease incidence cap from 5% to 2.5%; disease incidence never exceeded 3.5%.

Results

Exposure data were collected from 160 hazardous waste sites across Argentina (n = 36), Mexico (n = 74), and Uruguay (n = 50). The geographical distribution of the sites is shown in Figures 1 and 2. The estimated population at risk of exposure was 508,422 individuals (mean=3178; median=300 per site), which is approximately 0.31% of the total population. Of this population, it was estimated that 126,090 were women of childbearing age (15-49 years of age), while 182,907 individuals were older than the age of 18 years (see table 2). Of the exposed population, the proportion of women of childbearing age was relatively equal across the three countries.

394 biological (n=75) and environmental measurements (n=319) were used to calculate risk, with some sites containing multiple measurements. Mean blood lead levels (BLLs) in Mexico (n=56) and Uruguay (n=19) were found to be 19.63 ug/dL and 13.3 ug/dL respectively (Table 3). Of the three metals quantified, lead concentrations in soil (n = 164) were the highest and relatively uniform across the three countries (Table 4). Mean soil lead concentrations in Mexico (2748 mg/kg) were the largest, followed by Uruguay (2559 mg/kg) and Argentina (1730 mg/kg). Total and hexavalent chromium levels in soil showed the greatest amount of variability with concentrations spanning three orders of magnitude depending on the country. Mean soil chromium concentrations were highest in Mexico (1504 mg/kg), followed by Uruguay (643 mg/kg) and Argentina (2.4 mg/kg). Arsenic concentrations were measured in both soil (n = 57) and water (n =

4). Paradoxically, Uruguay had the highest mean arsenic concentration in soil (1210 mg/kg) and the lowest mean arsenic concentration in water (23 ug/L).

YLDs, YLLs, and DALYs by pollutant are shown in Table 5. BLLs were used to estimate DALYs in exposed populations in Mexico (n=79,196) and Uruguay (n=5,859). Since BLLs were not collected in Argentina, DALYs based on that exposure measurement could not be calculated. Elevated BLLs were responsible for 18,807 DALYs in Mexico, representing 47% of the disease burden estimated as a result of lead exposure. Elevated BLLs were responsible for 978 DALYs in Uruguay, representing 46% of the total disease burden.

An estimated 26,544 DALYs resulted from exposure to lead in soil. Combined with an estimated 19,785 DALYs based on BLL, lead was the largest contributor to YLD of the three heavy metals included in the analysis. Overall, lead exposure accounted for a total of 46,339 YLDs, or 99.5% of total YLDs resulting from exposure to metals analyzed in this study. The estimated population at risk for exposure to lead was 316,703, largely derived in sites from Mexico (189,593) and Argentina (112,208).

The estimated population at risk of exposure to arsenic was 129,820, with the vast majority living in Mexico (95%). An estimated 778 DALYs resulted from exposure to arsenic in the three countries. Arsenic had the largest contribution to years of life lost (YLL) accounting for 603 YLLs, or 81.4% of total YLLs resulting from heavy metals exposure. However, exposure to arsenic represented only a small fraction (0.37%) of the total years lived with disability (YLD)

Exposure to hexavalent chromium contributed 38 YLDs and 138 YLLs to our DALY estimates, affecting an estimated population of 61,899 in the three countries of

study. The YLDs and YLLs contributed by chromium represent 0.3% and 5% of their respective burden of disease contribution.

The overall burden of disease and premature death contributed by exposure to three heavy metals at screened sites were calculated. An estimated 46,544 years lived with disability (YLD) and 748 years of life lost (YLL) resulted from exposure to three heavy metals at the 160 unique toxic waste sites in Argentina, Mexico and Uruguay. These estimates form a combined 47,293 $DALYs_{(3,1)}$ with a value of 0.25 $DALYs_{(3,1)}$ per person estimated from screened sites (Table 5). Additionally, it was estimated that 368 persons would die prematurely from cancer, from exposure to arsenic and hexavalent chromium at these sites.

Sensitivity analysis

Without age weights, 42,131 $DALYs_{(3,0)}$ resulted, while removing both age weight and discount rate resulted in 104,912 $DALYs_{(0,0)}$. If the exposed population is 25% less than the original estimate, the resulting $DALYs_{(3,1)}$ are 35,470. If the exposed population is 25% greater than the original estimate, the resulting $DALYs_{(3,1)}$ are 59,110. If the disease incidence cap is set to 2.5%, 47,275 $DALYs_{(3,1)}$ resulted. Disease incidence never exceeded 3.5%. A remediation scenario where all pollutants were adjusted below international standards resulted in 7,628 $DALYs_{(3,1)}$. In comparison with the initial $DALYs_{(3,1)}$ estimate, 39,665 $DALYs_{(3,1)}$ could be eliminated if these sites were remediated, with the largest contribution from the reduction of concentrations in lead contaminated soils (38,806 DALYs), followed by arsenic (722 DALYs) and chromium (137 DALYs) (Table 6).

Discussion

This study sought to characterize the number of years lost due to illness, disability, or early death in Argentina, Mexico, and Uruguay. Environmental levels of three heavy metals were characterized in those countries and DALYs were calculated based on estimated exposure. In total, an estimated 47,293 DALYs resulted from exposure to arsenic, chromium, and lead from 160 toxic waste sites located throughout the study region. This burden of disease estimate represents screened sites only, and is likely to be largely underestimated. The estimated burden of disease as a result of exposure was approximately 0.11% of DALYs for all causes in the three countries of interest as estimated by the WHO. [27]

By quantifying disease burden from heavy metal pollution through a DALY-based method, comparisons can be made to other public health threats and chronic illnesses. The burden of disease estimated for exposure to arsenic, lead, and hexavalent chromium at screened sites is comparable to the burden resulting from chronic illnesses such as Parkinson's disease (52,800 DALYs) and multiple sclerosis (27,500 DALYs), as well as neglected tropical diseases such as Leishmaniasis (44,000 DALYs), in the three countries of analysis. [27, 30]

The ingestion and inhalation of heavy-metal contaminated soil and dust was the main exposure pathway, while exposure to lead was the largest contributor to estimated disease burden (98%) of the three heavy metal exposures evaluated. Biomarkers (BLLs) were used in the calculation of disease burden for lead exposure in Mexico and Uruguay, accounting for 42.7% of the DALYs estimated in those countries. Mexico is the fourth-largest producer of lead world wide, having generated 222,000 metric tons in 2012 and

continues to increase output.[31] Sites in Mexico included in the lead exposure analysis were currently or previously involved with production of earthenware with leaded glaze (n = 31), mining operations (n = 22), smelting activities (n = 3), used lead-acid battery recycling (n = 1) and manufacturing (n = 4).

Interventions aimed at reducing BLLs could potentially eliminate the 19,785 DALYs in Mexico (18,773 DALYs) and Uruguay (976 DALYs). Such interventions include the introduction of lead-free glaze in ceramic ware, introduction of legislation to regulate battery recycling, reduction of lead dust in the home, outreach and education about the health effects resulting from exposure to lead, as well as continued monitoring of BLLs. Despite producing lead in smaller quantities, exposure contributed significantly to disease burden in both Argentina (83,700 metric tons in 2013, 4,271 $DALYs_{(3,1)}$) and Uruguay (no lead production data available, 2,126 $DALYs_{(3,1)}$).[31]

Exposure to arsenic contributed an estimated 773 $DALYs_{(3,1)}$ in Mexico, but had little impact on populations living in Argentina and Uruguay. Major sources of arsenic in groundwater include alluvial aquifers, geothermal waters associated with recent volcanic activity, as well as areas where mining takes place.[32] Recommended interventions for arsenic exposure include reducing the affected population's intake of arsenic-rich groundwater and foods, introducing a safe water supply for irrigation in affected areas and disseminating information to educate residents about the associated risks of arsenic ingestion.[8]

A previous burden of disease study by Chatham et. al. found 54,432 DALYs attributable to lead exposure in India (n = 24), 78,982 DALYs in Indonesia (n = 28) and 394,084 DALYs in the Philippines (n = 27). While these estimates are larger than the

estimated 39,943 DALYs attributable to lead-contaminated sites in Mexico (n = 59), an estimated .39 DALYs per person resulted from lead exposure at these sites, higher than previous estimates for India (.21 DALYs per person), Indonesia (.21 DALYs per person) and the Philippines (.30 DALYs per person). In the same study, .10 DALYs per person were estimated for exposure to eight chemicals in India, Indonesia and the Philippines (mean population at risk of exposure per site = 23,079), while an estimated .24 DALYs per person occurred due to exposure from three heavy metals in Argentina, Mexico and Uruguay (mean population at risk of exposure per site = 3,158). This higher average DALY per person was likely a result of a smaller population at risk of exposure in the three sites, with higher average DALYs per person resulting from higher sample concentrations mostly due to lead exposure.

Industrial sources of chromium contamination include production of treated lumber, steel manufacturing and leather hide processing. In Uruguay, a number of smaller metal salvaging and burning operations were located in close proximity to informal settlements, which contributed to increased exposure. Alternatives exist for both the reduction of hexavalent chromium in industrial processes and ways in which to remediate contaminated-soils. Although naturally occurring tannins can be used to process animal hides many manufacturers continue to use hexavalent chromium due to its low-cost and rapid effectiveness. Efforts must be made to convince manufacturers of the economic viability of alternative, safer techniques. Bioremediation techniques include the use of salt-tolerant bacteria to reduce chromium levels in soil, while bone charcoal is known to be effective in removing chromium from contaminated bodies of water. [33,34] Injection of molasses into chromium-contaminated soils has also been shown to be

effective, as bacteria feeding on molasses transform hexavalent chromium to less harmful forms likely to bind with available rock substrates. [35]

A number of limitations for the calculation of disease burden should be noted. A limited number of environmental and biological samples were taken, and as a result, the population at risk was extrapolated from available data to those residing within a half-mile of the site. While BLL data were analyzed as biomarkers of exposure, these values were extrapolated to the remaining populations that were not screened.

While the analysis incorporated the three Latin American countries represented by the largest number of investigated sites in the TSIP database, a dearth of data existed for both Argentina and Uruguay. As a result, of the estimated population to be at risk of exposure, 62.6% resided in Mexico. Further site investigation is necessary in these countries to better estimate the scope of potential disease and disability resulting from exposure to pollution. While the analysis examined potential exposure from three heavy metals, a number of other pollutants of concern exist. Site investigators collected data for a number of other pollutants such as mercury, pesticides and various particulates contributing to air pollution. However, these analyzed samples were too few in number to generate an accurate burden of disease estimate. The use of mercury in artisanal small-scale gold mining (ASGM) is a known threat to public health in Latin America, and future site investigations must continue to identify sites of mercury exposure. [36] Additionally, further research is necessary to establish a disability weight for exposure to elemental mercury. Indoor air pollution, largely resulting from the burning of solid and biomass fuels, is estimated to be responsible for 1% of DALYs and more than 1.5% of premature deaths in the three countries of analysis. [37] Continued monitoring of both

indoor and ambient pollution is necessary to estimate a burden of disease resulting from these exposures, particularly in rural areas of Mexico. It is believed that cases of acute pesticide poisoning are underreported by 50 to 80% in Latin American countries. [38] Further site investigation must include screening for pesticides and continued exposure monitoring is necessary, especially for children who represent a large part of the agricultural workforce. [39] As the analysis was solely focused on exposure to three heavy metals, it is likely that the burden of disease resulting from exposure to toxic pollution is largely underestimated.

As a large portion of the disease burden estimated by the analysis was derived from exposure to lead, intervention and remediation programs should continue to focus on lead-contaminated sites in Argentina, Mexico and Uruguay. However, site investigations and efforts to estimate the burden of disease caused by pollution must continue to incorporate threats from exposure to multiple pollutants. Future studies should attempt to extrapolate these estimates to unscreened sites in an effort to estimate a more accurate burden of disease. This larger estimate is likely to be comparable with the burden of disease resulting from myriad chronic illnesses, and may be used as a tool to generate support and funding for the remediation of toxic waste sites in these countries and others. While it is believed that Argentina and Uruguay have largely concluded the epidemiological transition from infectious to non-communicable diseases, Mexico continues to struggle with threats from both. [40] While the three countries of study have protocols in place to monitor children's BLLs and reduce lead exposure, programs to regulate ULAB recycling exist in Argentina, while regulations limiting the content of residential paint exist in both Argentina and Uruguay. Efforts to reduce the burden of

disease resulting from lead exposure must include the introduction of such interventions in Mexico.

Tables

Table 1. Per capita cancer and noncancer human health risks by chemical and media for chemicals other than lead

		Cancer risk				Noncancer risk		
	Per ug/m^3 in air	Per mg/kg in soil	Per ug/L in water		Per ug/m^3 in air	Per mg/kg in soil	Per ug/L in water	
Arsenic	4.30 x 10^-3	4.69 x 10^-9	2.23 x 10^-5		NA	4.29 x 10^-6	8.57 x 10^-9	
Chromium VI (A, S, W)	8.40 x 10^-2	9.71 x 10^-8a	2.09 x 10^-5		NA	NA	NA	

Abbreviations: A, Air; NA, not assessed; S, soil; W, water.
a, inhaled airborne dust

Table 2. Exposed population by age and childbearing status

	Total Exposed Population	Women of Childbearing Age (15-49 years old)	All Genders > 18 Years old	Remaining Age Groups
Argentina	170618	40095	56986	73537
Mexico	318463	81527	120061	116875
Uruguay	19341	4468	5860	9013
Total	508422	126090	182907	199351

Table 3: Blood Lead Level (BLL) Data by Country

	N	Mean (ug/dL)	S.D. (ug/dL)	Range
Argentina	N/A			
Mexico	56	19.63		7.7 - 41.1
Uruguay	19	13.3		5.1 - 47.35

Table 4. Environmental Sample Data by Pollutant

	Argentina		Mexico		Uruguay	
	N	Mean*	N	Mean*	N	Mean*
Arsenic						
Soil Samples (mg/kg)	1	72	54	788	2	1210
Water Samples (ug/L)	2	35	1	100	1	23
Lead						
Soil Samples (mg/kg)	48	1730	59	2748	57	2559
Chromium						
Soil Samples (mg/kg)	68	2.4	4	1504	21	643
Water Samples (ug/L)	1	1.6	N/A	N/A	N/A	N/A

*Value shown is either the mean or single measurement

Table 5. YLDs, YLLS and DALYs by chemical.

Country	Chemical	No. of Sites*	Estimated Population at Risk	YLDs	YLLs	DALYs
Argentina	Arsenic	2	6000	1	2	3
DALYs per person = .13	Chromium	23	52410	1	2	3
	Lead	23	112208	4271	0	4271
Mexico	Arsenic	32	123770	174	600	774
DALYs per person = .32	Chromium	2	5100	12	41	53
	Lead	62	189593	39943	0	39943
Uruguay	Arsenic	1	50	0	1	1
DALYs per person = .21	Chromium	15	4389	26	94	119
	Lead	43	14902	2126	0	2126
Three Countries	Arsenic	35	129820	175	603	778
	Chromium	39	61899	38	138	176
	Lead	129	316703	46,339	0	46339
	Total	203	508422	46552	741	47293

*Some sites contained more than one heavy metal contributing to DALYs

Table 6. Sensitivity analysis estimates.

Secnario	Total DALYs
Primary estimate of screened sites	47,293 DALYs(3,1)
Estimate without age weights	42,131 DALYs(3,0)
Estimate without age weights or discount rate	104,912 DALYs(0,0)
Remediation scenario	7,628 DALYs (3,1)
If actual exposed population is 25% less	35,470 DALYs(3,1)
If actual exposed population is 25% greater	59,110 DALYs(3,1)
If incidence is capped at 2.5%	47,275 DALYs(3,1)

Figures

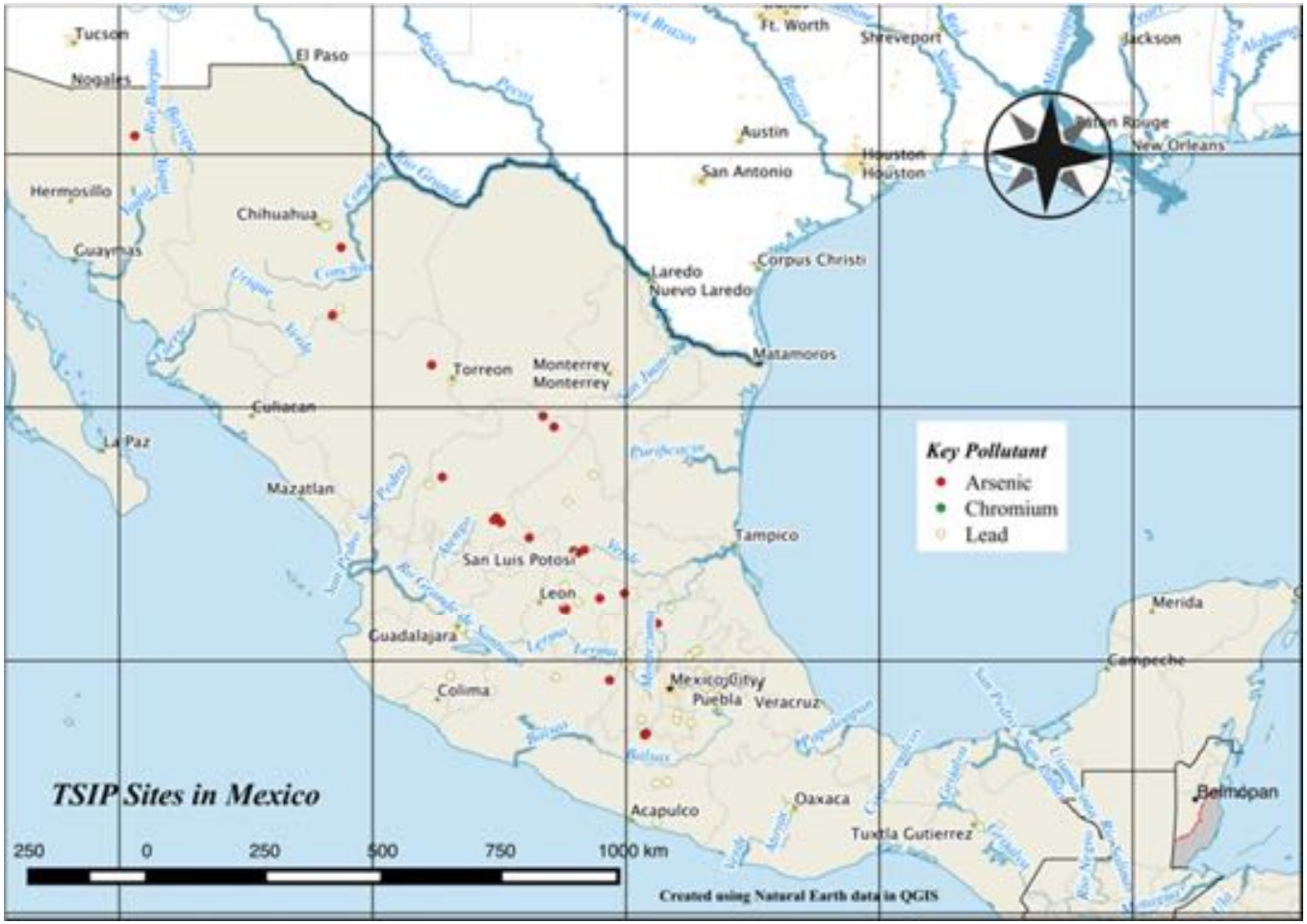

Figure 1. Geographical distribution of TSIP sites in Mexico.

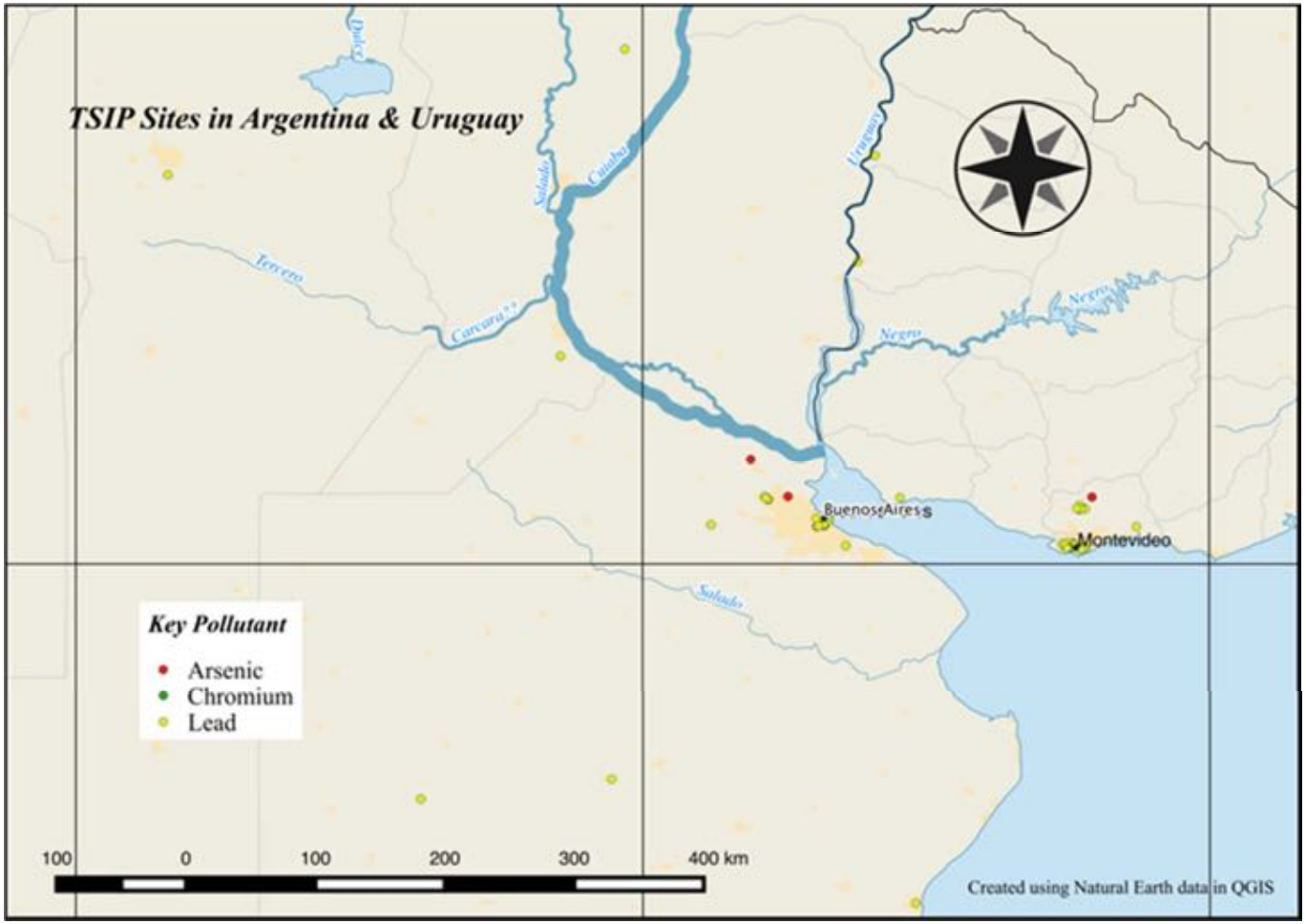

Figure 2. Geographical distribution of TSIP sites in Argentina and Uruguay.

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ASSESSMENT OF AN INTERVENTION TO REDUCE HAZARDS IN COPPER RECOVERY AT A GHANAIAN E-WASTE SITE

Capstone Paper

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Abstract

Purpose

Ghana receives and recycles large amounts of e-waste without resources or regulations for safe handling and disposal. Work is done through the open burning of wires to recover copper, a profitable metal. Burning leads to toxic exposures for local populations and the environment. A team sought to improve hazardous working conditions of electronic scrap handlers and to mitigate the environmental pollution and public health exposure risk.

Methods

To implement this initiative, controls in the form of wire stripping technology were used as an alternative to burning. An assessment of the equipment was done through onsite training and a feasibility study was designed to assess the economic incentive and benefits of using alternative technology. The study consisted of two teams using the respective method of burning or wire stripping to process 40 pounds of cable/wire bundles daily for 6 days.

Results

The cable stripping method on average took 3 hours longer than the burning method. The average weight of copper extracted using tools was 8% higher. The average difference in sale price for clean copper versus charred is about 28 Ghanaian Cedis.

Discussion

This intervention serves as a starting point to reduce toxic exposure for the local population, workers, and the environment. The biggest challenge is the processing time of manual wire stripping, which does the price differential does not outweigh. Organization of site, increased role of GASDA, implementation of regulations, and a centralized system for access and maintenance of equipment will collectively aid in decreasing the burning.

Introduction

Background and Significance

Electrical and electronic waste (e-waste) is an emerging environmental and human health problem in the world. E-waste described as e-waste consists of any appliance using an electric power supply that has reached its end-of-life. [1] In our technology driven world we tend to cycle through electronics and electrical products at a higher rate. Production of electronics with shorter life spans and continual advancement in technology yield a higher turnover rate, which increases the amount of discarded items and production of e-waste.

The global generation of e-waste is estimated to be 20 to 25 million tons per year according to the United Nations Environment Programme (UNEP). [2] According to a Greenpeace report, e-waste makes up 5% of all municipal solid waste worldwide, whereas in wealthy countries it may constitute up to 8%. [3, 4] One key study indicates that the amount of e-waste continues to rise and about 75 to 80% is shipped to countries in Asia and Africa, as a cost effective method of disposal. [5]

The mainstream movement of electronic waste is from wealthy countries to poor countries where methods of recycling and treatment are subpar. Recycling and disposing of e-waste in wealthier countries is relatively more expensive and complex due to systematic regulations. In these countries where e-waste is regulated, producers are required by law to establish electronic recovery programs as in the United States. [6] However, despite regulations some items that are deemed useless by donor countries are still of use to countries that accept e-waste items as second-hand donations, while other items are disposed. [7] The shipment of e-waste falls under the regulation of the Basel Convention, which is an international treaty controlling trans-boundary movements of hazardous waste and its disposal. [8] A gap in the treaty allows shipment of second hand donations to poorer countries as a method to transport unusable items that will end up in landfills or scrap yards. [7] Exportation can also continue with clandestine operations and by countries that have not ratified the treaty. [3]

Most developing countries where three-quarters of e-waste is shipped lack a comprehensive system for the collection and processing of e-waste, due to inadequate infrastructure, safety protocols, and access to technologies and funds. [5] E-waste is distinct from other forms of industrial and municipal waste because it contains both valuable and hazardous materials that require special handling and recycling methods to avoid harmful exposure to people and environmental contamination. [5] Workers have the potential to be exposed to heavy metals, inorganic acids, and poly-aromatic hydrocarbons when burning and dismantling e-waste. Recent, studies indicate causal evidence that there is a strong relationship between environmental pollution and e-waste. Research on air pollution has shown that burning activities at e-waste sites produce hazardous emissions that may have damaging health effects. [9] E-waste workers are exposed to airborne materials via inhalation, dermal contact, and ingestion, which may contain harmful levels of heavy metals. [10] Other studies show that e-waste recycling and treatment sites can potentially contaminate nearby soil, streams and rivers. Heavy metals and inorganic acids can leach into these waterways through wastewater or ambient air emissions and have the risk of contaminating soil, crops, fish, livestock, and drinking water. [9]

Site Characteristics

Ghana is one of the poorer countries that receives and recycles large amounts of e-waste without resources for safe handling and disposal. The Agbogbloshie site is the largest and main center for e-waste recycling and disposal in Ghana. [4] Agbogbloshie is a 15 acre site, on a flat terrain located on the west side of the Odaw River in the city of Accra, the capital of Ghana and is adjacent to the Agbogbloshie Food Market, as shown in *Figure 1*. [7] The site originally started as a food market for onions and yams, and although the market remains, there has a drastic increase of e-waste recycling over the years. As a result, the land was leased in 1994 from the National Youth Council as the Scrap Dealers' Association of Ghana. Since then, Agbogbloshie has been the hub of informal recycling industry in Ghana. [12]

The site is part of an industrialized area that consists of scattered recyclers working out of small sheds in an open area. Workers and families are located to the east of the site (about 100 meters across the Odaw River) in small informal settlements with little electricity and running water. [7] E-waste recycling at Agbogbloshie is done on an extensive level in a rudimentary way by manually disassembling e-waste items by hand, and open burning of wires and cables to recover copper which is covered by plastic encasements. Copper is a profitable metal that is then sold to make wages for the day. [4] This work is often carried out by children. About 73% of the workforce is aged 21 to 30 years using handmade tools and without personal protective equipment, leaving them susceptible to exposures. [4, 7] In addition, the site is a dumping ground for unused items including tin cans, remnants of disassembled machinery, and polyethylene bags that litter the land and obstruct sewer systems. [11] E-waste operations at Agbogbloshie are classified as informal recycling with limited worker health and environmental precautions.

E-waste site: Agbogbloshie

Electrical and electronic equipment imported into Ghana in 2009 was estimated to be about 215,000 tons, according to a Ghana e-waste Country Assessment Report. [13] Majority of the e-waste is imported from Europe and North America. [14] Of these imported items, about 30% are new products and 70% are used. Of the used products, it is estimated that 15% are broken and outdated, which is a significant portion that is directed to informal recycling. [14, 15] The used items have a shorter lifespan compared to new products, which leads to a higher e-waste generation per year.

A socio-economic assessment on sustainable e-waste management in Ghana focused primarily on Agbogbloshie, found that 10,000 to 13,000 metric tons of e-waste was treated annually by the informal sector. The refurbishing and recycling contributes about 105 to 268 million indirectly to the Ghanaian national economy. [15] Despite the amount of e-waste recycling and treatment that occurs in Ghana, primarily in Agbogbloshie; Ghana currently has no regulations for recycling and disposing of e-waste and does not enforce any regulations for the air, water, and soil quality. [7] Ghana ratified the Basel Convention in 2005, but has not incorporated it into the national legislation, therefore not put into practice. In addition there are no specific laws regulating the working conditions of e-waste workers. [16] Therefore the burning of the plastic sheathing of wires and cables to recover copper leads to toxic exposures for local populations by polluting the air, soil, and water.

A previous Blacksmith Initiative study was conducted based on occupational and environmental exposure to electronic waste recyclers in Agbogbloshie Market. This assessment confirmed that burning of copper wires is a leading source of toxic exposure for workers and surrounding communities. [7] A Greenpeace study confirmed levels 100 times the average background levels of concentration of copper, lead, zinc, and tin at the scrap yard. Also, lead in soil and ash were found to be as high as 5,510 mg/kg of dry weight from the Greenpeace team. [4] According to the Greenpeace report by Brigden and colleagues, most samples contained numerous toxic and persistent organic chemical pollutants and high levels of toxic metals. The majority of these compounds were intentionally used in electronic devices, and likely to be formed during open burning of materials such as PVC. Overall, a wide range of chemicals were present that are toxic, and can accumulate in the body. [4]

A Health Assessment study aimed to assess health symptoms and chemical markers in urine and blood serum among e-waste workers was conducted with a control population. From the total of 174 participants it was found that high levels of barium, manganese, chromium, selenium, and zinc were present in urine of the exposure population versus the unexposed. [17] As a result, adverse health outcomes were detectable in the exposure population at the Agbogbloshie e-waste site.

It is confirmed that toxic exposures occur at Agbogbloshie's waste site from previous studies consequently affecting human health and the environment. [4, 7, 17] Despite the potential exposure, e-waste provides thousands of jobs as a rising source of employment that supports families. [14]The amount of collectors, recyclers, and refurbishers employed at the site is estimated to be about 30,000 people from both the city and the country.[15, 18] Many of these workers in their varying roles live in extreme poverty, with their income ranging from $70 to $285 a month depending on their position. Also, it was found that most workers are between the ages of 14 to 40 years and work about 10 to 12 hours a day, which is about 300 to 360 hours a month. [15] Given the estimated low wages of these workers, long hours of daily work, and hazardous working conditions the state of Agbogbloshie's e-waste site is a major challenge.

Project Partners

The project team consisted of the CUNY School of Public Health, Blacksmith Initiative UK, Green Advocacy Ghana (Green Ad), and the Greater Accra Scrap Dealers' Association (GASDA) all considered part of the Blacksmith Initiative Team. Faculty and selected students from the CUNY School of Public Health at Hunter College participated in the research of purchased wire stripping technology, demonstration and training of equipment, and aided in the design of feasibility study. Blacksmith Initiative UK, an international not-for-profit organization geared to solving life-threatening pollution issues in the low and middle-income countries. Blacksmith played a role in organizing key players, distributing funds for the project, and coordinating the feasibility study. Green Advocacy Ghana (Green Ad) is an organization that aims at upholding and enhancing sustainability and integrity of Ghana's environment. [12] Green Ad staff participated in training of e-waste workers, implement study, and recordkeeping. The Greater Accra Scrap Dealers' Association (GASDA) is an umbrella organization made up of individuals involved in the scrap business in the Greater Accra Region. GASDA workers participated in training and were part of the feasibility study. Overall support for this project was given through Comic Relief Research to purchase wire stripping technology, initiate field training, and implement the feasibility of alternative technology study.

Purpose

A team of partners consisting of members from the CUNY School of Public Health, Blacksmith Initiative, Green Ad, and GASDA sought to improve hazardous working conditions of electronic scrap handlers and to mitigate the environmental pollution and public health exposure risk to Southern Accra. The main toxic exposure for the local population and e-waste workers is the burning of plastic sheathing of wires and cables to recover copper, a profitable metal at Agbogbloshie. This burning poses a risk to the population and also contamination to the environment. Also, there is a lack of a coordinated approach for collection, transportation, storage, and disposal of e-waste at Agbogbloshie with less stringent regulations.

To implement the initial training which leads into a study, controls in the form of wire-stripping technology were used as an alternative method to burning of copper wires to serve as a starting point to reduce toxic exposure. The first part of this intervention consisted of training with CUNY and Green Ad staff. Green Ad staff then trained e-waste workers. This was to allow workers to be comfortable in being training with the equipment by personnel who spoke the same dialect and languages. Then, an onsite field demonstration with Green Ad staff, GASDA workers, and Blacksmith staff took place to replicate a normal work environment. A few days after the field testing, the staff of Green Ad and Blacksmith met to discuss the field testing activities and assess the technology. It was then determined that a longer field trial with a quantitative assessment to determine feasibility would be necessary before launching the new technology.

The feasibility study took place at Agbogbloshie under normal conditions and onsite selling to mimic realistic prices. These procedures attempted to replicate normal e-waste site operations as closely as possible with the implementation of engineering controls to reduce bias.

The training session and feasibility study raised awareness in already known issues of site and potential risk to local population and workers. Also, the project provides a step forward in implementing a solution through alternative technology.

Methods

Research and selection of technology

In early 2012, the Blacksmith team consisting of Hunter College faculty and students researched and purchased wire stripping technology. Research began in a general method, examining all types of wire stripping tools and technology based on internet searches, tool catalogues, and experience from past visit to Agbogbloshie. Tools that could strip wires of varying gauge sizes and length were also taken into account to allow for a wider range of use.

After this general assessment of available technology, elimination began based on what would be most suitable at Agbogbloshie's e-waste site. The Blacksmith Initiative team had a prior visit, therefore firsthand accounts on what may be most applicable to the site was provided. This list included equipment that was non-electric, portable, and reasonably inexpensive. Further elimination was done based on these factors, which resulted in a list of wire stripping technology that was purchased.

With the wire stripping equipment at hand, two days of preliminary testing and training of the tools and equipment were conducted in New York. The testing aided evaluating and selecting efficient technologies and methods in ensuring that the initiative team was thoroughly familiar with the equipment to train Ghanaian partners. In this testing phase, old wires, cords, and cables were used to extract copper. An unused computer tower was also taken and dismantled by hand by the team using the available purchased equipment. All wires used were clean and undamaged upon initial use. From this hands-on assessment, only the most cost effective tools were chosen to be taken overseas to conduct a field training and assessment at Agbogbloshie's e-waste site. The tools consisted of hand-held wire strippers/cutters, adjustable wire strippers, automatic wire strippers, cable strippers, a wooden plank with grooves and utility knives, manual bench top wire stripper, and a manual wire stripping machine. Descriptions of purchased technology are shown in *Table 2*.

Green Ad recruited subjects form GASDA and ensured compliance with Ethical Review Board policies for the training and feasibility study.

Field Training and Assessment of Wire-stripping technology

In Mid-March of 2012, the Blacksmith Initiative team traveled to Accra, Ghana with equipment. Initial training consisted of demonstration and hands on training of wire stripping technology with Green Advocacy Ghana staff at their headquarters, which is about 15 miles from Agbogbloshie's e-waste site. This initial training took place so Green Ad staff could train e-waste workers from the site.

The technology was arranged by stations based on types of wires that it can be used on. There were groups for small diameter wires that consisted of handheld stripping equipment, another for medium sized cables, and another for larger diameter long segments of wire that consisted of the bench-top strippers and stripping machine. The Blacksmith Initiative team demonstrated the usage of the tools based on the stations. All wires and cables used in this process were clean and undamaged. After the demonstration, Green Ad staff were able to become familiar with the types of technology. This initial training with staff lasted for about 2 hours.

For the second portion of the training, 6 GASDA workers arrived at Green Ad's office. These workers were chosen by Green Ad and senior leadership of GASDA based on the familiarity of working together. The workers were paid to participate in this initial training. The e-waste workers brought material from Agbogbloshie, which consisted of a bundle of worn out cables and wires. The GASDA workers became familiar with the stations of equipment and received demonstration from Green Ad staff. The e-waste workers were able to get hands on experience with the equipment to gain familiarity on its usage, using the bundle of wires from the waste site. This part of the training lasted for about 2 hours until workers felt comfortable with all tools. Blacksmith Initiative staff observed this portion of the training and assisted workers with questions and additional demonstration, records of workers opinions on the tools were also noted. The acquaintance between GASDA workers and Blacksmith staff would aid in the next step of the training.

After preliminary demonstration and training of the technology off-site, all the wire stripping equipment was taken to the Agbogbloshie's e-waste site the next day. The 6 GASDA workers that participated in the previous day's training were present and given an additional paid incentive for the two days of onsite training that would take place. All staff were taken to the usual work station of the GASDA members in Agbogbloshie. This area consisted of a small wooden shed with wooden tables, benches, and chairs. The shed served as a break area for workers to eat and relax as it was opened to the rest of the waste site. In this portion of the site, dismantling of e-

waste occurred by hand. Another area served as the burning site. As in the preliminary training, the equipment was set up in stations and laid out on the benches. The chosen GASDA workers were able to bring their own acquired wires and performed wire stripping using the technology. As the GASDA team used the equipment, other e-waste workers came and demonstrated the tools, some brought their own wires and tested on the equipment. This lasted for a period of two working days. During this time, assessments of wire-tripping technology were performed based on the two days of training, taking into account the advantages and disadvantages of each tool. This was done based on workers opinions of using the tools and also through a consensus of workers during operations of using the wire stripping technology in their normal work setting. The results of this assessment can be found in *Table 2*.

Feasibility Study of Copper Recovery through Cable Stripping

The economic feasibility of time and financial benefits of using wire strippers as an engineering control to extract copper was quantified and assessed, to compare to the process of burning wires. This study focuses on two groups, one using the burning method to remove plastic sheathing from wires, and the other using wire stripping technology demonstrated through offsite and onsite training.

Methods of Study

Participants of the study consisted of six experienced electronic scrap workers and burners selected from the GASDA that also participated in the onsite training in March 2012. These workers were chosen based on their familiarity of the introduced technology that will be piloted in the study. Each of the six workers were paid for each day, which was the same amount for each person to participate in the study. The six GASDA workers were divided into two teams, Team S (wire-stripping team) and Team B (burning team). The division of teams was based on random selection to prevent bias. Team S acted as the experimental group using the new alternative stripping technology, and Team B acted as the control group using the normal method of burning. Each participant was familiar and comfortable in using either method.

Technology and Materials Used

At Agbogbloshie's e-waste site there are various gauges and types of cables and wires that contain copper. To simulate a normal work setting, each team worked with a variety of thin wires, coiled wires, transformer wires, and other various types. The sources of these materials included ICT equipment, old vehicles, telecommunication equipment, and other household electrical cables. The cables and wires were obtained or purchased by members of the teams from onsite dealers who procure bundles from scavengers. The targeted daily quantity for copper extraction by the two teams was a total of 80 pounds or 40 pounds each. Scales were available on site at various selling points belong to metal buyers. Therefore it was not necessary to obtain a scale specifically for the pilot exercise, although these scales did not provide high accuracy in weighed materials in decimals. The scales were used for the weighing of raw cables before using stripping or burning respectively, and copper after processing for both teams. Overall the study was designed to involve routines and materials that were used in an ordinary day operation.

The equipment used for wire striping by Team S consisted of technology assessed and used in training and demonstrations. This included knives, blades, automatic strippers, manual wire stripping machines, bench top wire strippers, pliers, and cutters; with further descriptions noted in *Figure 2*. The equipment used for burning by Team B consisted of Styrofoam, matches, and containers of water that are used under normal operating conditions.

Cable Processing

The total of 80 pounds of cable bundles obtained on site by members of the teams were mixed up, divided, weighed, and apportioned into two equal parts, taking into account a variety of cable types and sizes for both teams. This division of wires was completed by Green Ad staff to ensure fairness, and weight was taken from onsite scales. Team S set up wire stripping tools on working tables and benches and prepared for work. Team B purchased needed equipment from the site to be used as fuel for the fire. The stripping and burning activities of the two teams were carried out at different locations on the e-waste site.

The two teams started their respective operations of cable stripping and cable burning at the same time (9:00 am), each processing a batch of 40 pounds of identical cables. Each team was supervised by a Green Ad research member to ensure equal distribution of copper, record working time and conditions, and to ensure independence in two teams. Green Ad also ensured additional workers did not interfere with each teams work for the day to prevent bias.

After the given amount of cables and wires (40 lbs.) was processed, the teams respectively collected their generated copper for the day. When processing was completed, the team was allowed to complete their duties for the study, despite if one team finished before another.

Team S collected the clean copper wires into a container and the plastic sheathing collected in a waste bin.

Team B used a pole to assemble the hot copper wires from the burning spot and sprayed the hot copper with water to cool it down. In addition to the copper oxide char present on the burnt copper, the process of dragging the hot cables through the dirt caused further contamination on the wires. The charred copper wires were transferred into a container.

Both sets of products produced from both teams, clean and charred copper were weighed using an on-site scale at one of the selling points. Weighing was monitored by the Green Ad staff and then sold to a metal buyer based on the team's discretion to obtain a realistic price. The selling of the daily output was immediate after processing was completed. Green Ad staff also recorded the weight in amount of extracted copper and the price that it was sold for. The money collected from sold copper were kept by workers in addition to their paid incentive. This added an additional incentive so if more copper was produced the more they would obtain.

This overall process was repeated for seven additional days to allow for a pool of data to be gathered by Green Ad staff.

Results

During the duration of the feasibility study there was no interference of rainy weather. The weather was hot and dry. Daily operations continued under normal conditions. The scrap market was active with people hauling in parts, trading, dismantling, burning, and selling during the study.

During the first two days of the feasibility study, the amount of materials was inadequate as a result of artificial scarcity of strictly copper wires. Although results for all days were recorded, only the results of days 3 to 8 were used in the analysis.

The range of processing time for cable stripping was between 159 to 201 minutes. The average time spent to extract processed copper using wire stripping technology was about 185 minutes, with a range between 8 and 12 minutes. The amount of time taken to extract copper through burning was an average of about 10 minutes. For both methods, the initial amount of wires was 40 pounds each. The cable stripping method on average took about 3 hours longer than the burning method. However, the average weight of copper extracted using tools was 8% higher than the burning method. The amount of copper extracted using technology ranged from 30 to 32 pounds, with an average loss of 22%. The amount of extracted copper using open burning ranged from 27 to 30 pounds, with an average loss of 30%. The comparison of weight of extracted copper and the corresponding processing time are present in *Table 3*.

On average 78% of processed copper was recovered from manual wire stripping. The sale price of clean copper ranged from about 162 to 173 Ghanaian Cedis. The average sale price for processed copper was about 168 Cedis for about 31 pounds of copper, which is equivalent to 5.4 Cedis per pound. For open burning, on average 70% of copper was recovered. The sale price of this charred copper ranged from about 135 to 150 Cedis. The average sale price for charred copper was about 141 Cedis for about 28 pounds, which is equivalent to about 5 Cedis per pound. The average difference in sale price for clean copper versus charred copper was about 27 Ghanaian Cedis. The comparison of the fraction of copper recovered and sale price of varying techniques is presented in *Table 4*.

Post assessment of technology

Some tools were considered suitable for stripping activities at Agbogbloshie, while others turned out to be less appropriate. Comments found below were taken from workers during the initial training sessions and from the feasibility study by Blacksmith Initiative Team and Green Ad.

For the Board (channel) stripper it was quoted, "*This is a very good idea but very slow. I am not sure my people would be willing to waste all the time stripping."* The automatic hand stripper was popular for short segments of small wires. The crank stripper machine was the most efficient and popular technology. One worker talked about the cranker as *"Very good ideas but get us a motorized cranker which is bigger; we would be willing to contribute and pay for it."* Workers were excited to learn the new techniques, as quoted from one of the workers, "*We thank them for bringing this equipment because I know that burning is damaging our health."*

One of the chairmen of GASDA said, "*….at this stage, it is important for capital investment especially towards the purchase of cables, processing, and subsequent sales to ensure that the situation is run as a business."*

Discussion

Various wire-stripping controls introduced at Agbogbloshie provide an alternative solution to burning for workers at the e-waste site. The feasibility study indicates that the processing time was about 3 hours more for manual wire stripping as opposed to open burning. However, cable stripping produces about 8% more in pounds and on average 28 Cedis more than the open burning method.

From previous studies, it is known that open burning produces toxic health effects. This is one of the first studies to introduce an intervention in the form of a feasibility study to assess factors to prevent burning. The study compared factors such as processing time, sale price, and amount of copper recovered from the normal method of open burning compared to manual wire stripping. The common goal for all parties involved in this project, including workers was to stop or minimize the burning due to its adverse health effects.

The processing time was arguably the biggest challenge to reconcile. In a subsistence economy such as in Ghana, livelihoods are often extremely time based as it can take an entire day's work to earn enough income to support basic needs. The extra time spent on manual wire stripping could impact other income generating activities for workers. Although, cable stripping produce more clean copper at a higher price, the price differential does not outweigh the time restraint to provide an incentive for the workers to switch their methods. One of the tools used, the MWS-808 manual wire stripping machine known as the cranker was most effective with the workers in terms of processing clean copper in a fast and efficient manner. This machine is costly with a price of about $500 US dollars and is most efficient and useful with increased organization. For this reason, GASDA believes the best option would be for the association to purchase the cables wholesale and manage the entire sector with the organization of equipment to ensure that all workers are using the stripping method.

There are two groups of buyers, onsite and off-site buyers that influence the sale price of copper. The onsite buyers are those who operate at Agbogbloshie. The off-site buyers are in factories purchasing bulk quantities for export. The off-site buyers are primarily interested in clean copper and are willing to pay the extra premium. The onsite buyers also pay a little more, about 0.4 Cedis additional than what they usually pay for the burnt copper. However, there was a reported growing market for clean copper which can provide further incentive in using alternative technology. At this time, majority of the copper available to buyers was burnt and oxidized. Through surveying, it was revealed that if there was an option to purchase clean copper on a consistent basis, the premium will rise. At this point, there were few workers offering to sell non-burnt copper that buyers cannot rely on a steady stream of clean product. Further investigation should be conducted into the buyer's perspective on this issue.

Regardless of the limitations in processing time, it was learned that workers as well as the GASDA organization want to step away from their current method of burning. Most workers understand and agree that the burning of cables is not the best solution, and would readily embrace an alternative as long as the cost and time remains competitive. The recommendation at this time is that the technology can be improved to include more sophisticated machines. Further training and awareness can go a long way to change the perception on the equipment and tools and increase familiarity.

E-waste recycling is a rapidly expanding industry at Agbogbloshie. Despite the environmental tolls, this sector has the potential to create safe and sustainable jobs. The expansion

of GASDA has laid the groundwork for much needed organization. The expansion in the number of members, indicates that many e-waste workers are looking for a more stable work environment. Although a great deal more needs to be done to create infrastructure and business networkers required to sustain a profitable economy. To catalyze this shift, an organized labor force would be critical to improve the quality of life for the industry from e-waste dealers to collectors and to recyclers. Workers will need to continually organize and promote their interests and needs at both the local and national level. If workers can invest in strengthening their organizational infrastructure, they can start to consider the purchase of shared equipment and technology in a cooperative way. A centralized system can enable equitable access and maintenance of equipment. It can also strengthen the community's voice to the government to demand social benefits and protections.

The major outcome of this intervention was the awareness that was raised in the introduction of methods that can serve as a starting point to reduce toxic exposure to the local population, workers, and the environment. A local television station was onsite during the training and broadcasted messages based on alternatives to burning. Also, government agencies will take more of an initiative to participate in working together with GASDA and other agencies to stop the burning, provide a framework to address e-waste issues, and formalization of regulations. GASDA also realized that they need to play more of a role in the recycling of e-waste in providing more guidance and organization.

Future Study

The next phase of this work will focus on building business groups based on specialties that can be registered as a company under GASDA. This will lead to more organization of the site. More research can be done using electric equipment to determine feasibility of its usage along with more efficient technology as opposed to various types. Conducting a study using efficient technology can then show a significant difference in alternative technology compared to burning. In addition, to using more efficient technology there should be options for workers to recycle and sell plastic sheathings. When using the wire-stripping method, pure copper is retrieved along with plastic. This can lead to additional profits and demand for a plastic market on the site.

Children should be prohibited from working on site and to implement this fines should be imposed. Along with organization of the site, social amenities in the form of training and meeting rooms can be established to initiate more collaborative efforts between workers. Additional training should also be conducted on an ongoing basis for workers who would like to become familiar with methods. Also, awareness sessions should be conducted to increase workers knowledge of the health effects and alterative solutions that are available. These sessions can also include introduction of personal protective equipment that can minimize exposure.

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Appendix



Figure 1: Location of Agbogbloshie in Accra, Ghana highlighted in red.

Homes of the e-waste workers are noted to the east of the site. The food market is adjacent to the entry of the e-waste site leading into the recycling operations. The burn sites can be found at the south east portion of the area closest to the homes of workers. The Odaw River surrounds the two sides of the Agbogbloshie market then runs south through the city of Accra where it meets the Gulf of Guinea.

Table 2: Assessment of wire stripping technology

Tool	Cost (dollars)	Description	Advantages	Disadvantages
Hand-held wire strippers/cutters	15-25	Strips wire gauges 12-32 AWG	Useful for small segments leaving a clean cut	Time consuming, not ideal for large, long segments
Adjustable Wire Stripper, 18-28 AWG	46	Adjustable for gauges 18-28 AWG	Quick, handy, light weight, simple to use, precise stripping	Not ideal for long segments, requires force
Automatic Wire Stripper, 8-22 AWG	25-35	Automatic stripper for 8-22 gauges	Quick, handy, light weight, simple to use, does not require much force	Only for certain sizes, not useful for large or long segments
Klein Radial Coax Cable Stripper 2-Level	13	Light weight hand held tool, uses finger loop and pre-set rotating cutting blade	Useful for small segments, precise cut, adjustable gauge	Not ideal for long segments
Wooden Grooves and Utility Knife	10	Table top apparatus with various size of grooves using a utility knife to cut wire sheathing	Ideal for stripping long segments, can be made specific to wire length and diameter	Not ideal for large diameter wires, two people needed for efficiency purposes
Seatek SA200 Strip-All cable and wire stripper	15-21	Light weight, compact, hand held tool, uses calibrated dial for precise depth of cut	Useful for medium to large diameter wires of long segments, adjustable blade	Not ideal for small wires, requires human force
Manual Bench-top Hand Wire Stripper	65	Mounted table top device that uses human power and skill to manually strip wires	With desired setup, stripping can be quick, efficient for long pieces	Manually adjustments of blades need to be set for varying sizes, not suitable for small wires, human force required
MWS-808 Manual Wire Stripping Machine	525	Mounted table top device that automatically adjusts wire sizes with nine channels of cutting blades	Quick, simple to use, efficient, ideal for stripping long segments, separates copper and plastic sheathing	Human force required, not efficient for bundled/twisted wires

Table 3:

Comparison of Weight of extracted copper and processing time

Day	Weight Before Processing (lbs)	Cable Stripping for Copper		Cable Burning for Copper		Difference in Time (minutes)
		Weight After Stripping (lbs)	Processing Time (minutes)	Weight After Burning (lbs)	Processing Time (minutes)	
1	30	21	120	15	10	110
2	36	27	200	33	09	191
3	40	31	185	28	11	174
4	40	32	178	30	08	170
5	40	30	198	29	09	189
6	40	31	159	27	09	150
7	40	31	189	28	12	177
8	40	32	201	27	11	190
Total	240	187	1,110	169	60	**1,050**
Average	**40**	**31.2**	**185**	**28.2**	**10**	**175**

Table 3 shows that the average time spent to extract processed copper using technology was about 185 minutes. The amount of time taken to extract copper through burning was an average of about 10 minutes. When using both methods the initial amount of wires was 40 pounds. The cable stripping method on average took about 3 hours longer than the burning method. However, the average weight of copper using tools was 8% higher than the burning method.

Table 4:

Percent of copper recovered and sale price comparison

Day	Copper from Stripping			Copper from Burning			Difference in Price (GHS)
	Copper Recovered (lbs)	% of Cu Recovered	Sale Price (GHS)	Copper Recovered (lbs)	% of Cu Recovered	Sale Price (GHS)	
1	21	70.0	113.4	15	50.0	75.0	38.4
2	27	75.0	145.8	33	75.0	165.0	(20.8)
3	31	77.5	167.4	28	70.0	140.0	27.4
4	32	80.0	172.8	30	75.0	150.0	22.8
5	30	75.0	162.0	29	72.5	145.0	17.0
6	31	77.5	167.4	27	67.5	135.0	32.4
7	31	77.5	167.4	28	70.0	140.0	27.4
8	32	82.0	172.8	27	67.5	135.0	37.8
Total	**187**	**469.5**	**1,009**	**169**	**422.5**	**845**	**164.8**
Average	**31.2**	**78.3**	**168.2**	**28.2**	**70.4**	**140.8**	**27.5**

Table 4 shows that on average 78% of processed copper is recovered from the cables while 70% of copper is recovered from open burning. The average sale price for processed copper is about 168 Cedis for about 31 pounds of copper, which is equivalent to 5.4 Cedis per pound. The average sale price for charred copper is about 141 Cedis for about 28 pounds, which is equivalent to about 5 Cedis per pound. The average difference in sale price for clean copper versus charred copper is about 27 Ghanaian Cedis.

Assessing grit lead levels from roadsides in neighborhoods affected by Superstorm Sandy in NYC

A+ for paper

A for poster

A+ for course

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Abstract

Background. Previous studies have identified a direct association between elevated blood lead levels and soil lead, but there are no known studies of soil lead in NYC.
Objectives/Methods. This study attempts to compile a background of residential grit lead levels in NYC by investigating the relationship between urban grit after Superstorm Sandy comparing roadside grit from storm affected areas one month (n=99) and six months (n=98) after the storm to areas that were not affected (n=76) by the storm surge. Grit lead levels were also compared in order to determine if samples containing construction debris had higher levels of lead. **Results**: The sampling analysis revealed that there was no significant difference between grit lead levels one month mean, (95% CI: 0.0, 204.7 ppm, p=2.40) or six months after the storm mean (95% CI: 5.6, 97.7 ppm p=1.33;) compared to unaffected areas. However, there was a significant decrease overall in grit lead levels within the same sample sites (p=0.0005). Findings show that samples containing construction debris (n=42) did not have a significantly high levels of lead p=0.78). **Conclusion**. Although mean lead levels were below the EPA standard of 400 ppm, the geometric means for grit lead in affected areas during Phase 1 (82.4 ppm) and unaffected areas (80.1 ppm), were at levels known to cause intellectual detriment to children. Therefore, further studies in NYC may prompt a regulatory change to create standards limiting soil lead levels below 80 ppm similar to California's standard which can be of substantial benefit for children.

Abstract: 250

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Background

On October 29, 2012, Superstorm Sandy hit the most densely populated city on the eastern coast of the United States, New York City. The storm surge from Sandy reached up to 14 feet, [1]higher than any other high-water event in NYC over the past century.[2] As of March 2013, 57,000 flood claims were made in New York state alone.[3] Sandy's significant size left damage far exceeding that of previous natural disasters in the United States, such as Hurricane Katrina, which was estimated to exceed $84 billion in damages.[4]

More than 100 homes burnt completely in the gated community of Breezy Point in Queens, NY. In the aftermath of Superstorm Sandy, thousands of homes were left with water damage. Many homeowners were unable to return to their homes immediately after the storm. However, within weeks, homeowners began demolition of water damaged homes and debris removal from homes, many of which were built prior to the 1970s.[5] When houses containing lead paint are demolished, large quantities of lead-containing dust can be generated.[6] Demolition and debris removal from homes built prior to the 1978 Federal ban on lead paint in residential buildings has been associated with increased lead levels in ambient dust, [6]which can easily settle on topsoil or on roadway surfaces. The US Environmental Protection Agency (EPA)[7] reported an estimated 18 million homes built prior to the eighties to have soil lead concentrations above federal standards.

Natural levels of soil lead in the United States are usually below 50 ppm, but can exceed 200 ppm in urban soils.[8],[9] The U.S. EPA's standard for soil lead in children's play area is 400 ppm and 1200 ppm for all other residential soils.[10],[11] Although the EPA has set a guideline to keep children's blood lead levels at 10 µg/dL, studies have shown that intellectual impairment in children can be seen at lower levels ([12],,[13] Lead poses a significant risk to young children under the age of 6 and is a major public health concern; however, the risk varies significantly with age due to lead's ability to be stored in the bone .[14] Exposure to lead can lead to neurotoxicity, developmental delays, hypertension, impaired hearing acuity, impaired hemoglobin synthesis, and male reproductive impairment.[14,15] Using a modeling system, California's Office of Environmental Health Hazard Assessment (OEHHA) has developed soil and dust lead guidance below 80 ppm, level at which children's blood lead levels may be raised by 1 µg/dL and is known to reduce their IQ by 1 point.[16,17]

Until recently, studies were inconclusive as to a positive correlation between lead contaminated soil and lead exposure.[18] However, recent studies show that soil lead is an equally, if not more, important source of blood lead exposure as lead paint due to the addition of lead in gasoline and paint from 1920s to 1989.[19-21] According to the agency for Toxic Substances and Disease Registry (ATSDR), the greatest anthropogenic release of lead into the environment occurred from 1950 to 2000 due to the use of leaded gasoline and can be commonly found in soil especially near roadways, old homes, incinerators, landfills, mining areas, and industrial sites. [10]

Zahran et al[22,23] showed that immediately after Hurricane Katrina therewas a significant association between neighborhood soil lead and blood lead levels in children. Zaharan et al[23] found that as soil lead level decreased from 328 to 204 ppm to after Hurricane Katrina children's blood lead levels also decreased significantly by 1.20 to 1.65 µg/dL $p \leq 0.01$). [t values are not

usually quoted, only the p value] Two years after Hurricane Katrina, Rabito el al[24] found that elevated lead levels in residential soil and dust was most closely associated with the age of housing. In a comparison of pre and post-Katrina samples, the median soil lead level was 37% higher in the 2007-2008 survey than the 1998-2000 survey. Of the homes surveyed, more than 61% had indoor and outdoor lead levels above federal standards, most of which were considered to be low risk homes when controlling for sociodemographic variables. Almost half (46.7%) of the 90 homes with bare soil surveyed had soil lead levels above 400 ppm and 26.7% of homes had soil lead levels above 1200 ppm. Age of housing was significantly associated with high lead levels ($p<0.05$) in both unadjusted (OR=82.0; 95% CI: 10.3, 6151.5) and adjusted (OR=8.9; 95% CI: 3.1,26.0) models. In areas with high levels of lead in soil, children may be exposed to a greater burden of blood lead levels.[18]

A recent study shows that elevated blood lead levels (EBL) in children in New Orleans, after Hurricane Katrina and Rita, are more likely associated with soil lead than lead paint.[25] The most common pathway for lead in soil is ingesting lead by hand to mouth behaviors[15] via contaminated hands, toys, food or if the child inhales lead dust that can easily be released into the air during dry periods.[26]

The US EPA's,[27] *Child-Specific Exposure Factors Handbook* estimates that a child from 6 weeks up to 12 months ingests about 60 mg of soil and dust per day and 30 mg of soil per day. Children ages 3 to less than 6 are estimated to ingest 200 mg/day of soil and dust at most; The central tendency ingestion rate is 50 mg/day, while those who exhibit geophagy is estimated to ingest 50 g/day. Elevated blood lead levels in children have shown be considerably higher during the summer months than winter months in New York State,[26] as have been seen in other states, [28]correlating with an increased contact with contaminated dust and soil during the summer.

Based on previous data, storm-related renovations may pose an increased health risk among children. The EPA Integrated Risk Information System (IRIS)[14] does not provide an RfD for lead because there are no known safe levels of lead. There are many sources of lead in the urban environment; however, increased demolitions and debris removal may be a major source of lead dust accumulation on roadsides and sidewalks which may easily be tracked into homes on the bottoms of shoes, by pets, and on clothing. Children can also ingest lead through hand to mouth contact.

There are few published reports providing background lead soil or lead grit data for NYC. The goal of this project was to establish background grit lead levels in NYC for future studies in the aftermath of Sandy and to provide a survey of residential lead hazard in the aftermath of Sandy. In this study grit was defined as a combination of soil, outdoor settled dust, sand and urban rubbish that may be found on roadsides. Samples were collected in 2 phases. During the first phase, samples were collected about one month after the storm, while for the second phase, samples were collected about 6 months after the storm.

Methods

Sample Site Selection: Sample locations were selected based on a worst-case scenario method. The NYC flood evacuation map was examined to determine areas with the highest potential of flooding (Zone A, 7-12 feet storm surge). Google's Interactive Hurricane Sandy Crisis Map was examined to determine locations of relief aid stations within Zone A neighborhoods. Highly affected Zone A neighborhoods in Far Rockaway (Region 1), Rockaway Beach (Region 2), Breezy Point (Region 3), and Coney Island (Region 4) were identified. An on-site visual evaluation was conducted to choose sample locations. Samples were collected in a grid format. Ten to twenty-three samples were collected in these regions. Sites sampled in this study were categorized into 7 regions according to location. The samples were collected in mostly residential neighborhoods and some commercial/residential neighborhoods. Samples were collected on November 20th, 2012.

Grit samples collected in Staten Island (Regions 4-7) were obtained. Samples that were collected in Staten Island were randomly collected in three different regions along the eastern coast. A total of 26 samples were collected in these regions. Samples collected in regions 4 to 7 were all collected on November 25th, 2012. On April 9th and April 13th, about six months after the storm, phase 2 of sample collection was conducted. Samples were taken from storm affected areas using the same methods as those used to collect samples in November the previous year.

Background samples were obtained from areas away from storm activity. Samples were collected from roadsides along the Select Bus Service (SBS) routes in the Bronx (Region 8) and Manhattan (Regions 9-12). SBS bus route maps were used as sampling maps in order to identify sampling locations. Bus stops were selected as sample locations along each route. The SBS routes were along major thorough fares in mostly commercial neighborhoods along large roadways. Fourteen to 21 samples were collected along each route. The samples were collected late November to early December of 2012. Phase 2 sampling was not conducted for unaffected areas along the bus routes.

Sample Collection: Outdoor surface grit samples were collected using a dustpan and a brush into 50 mL plastic centrifuge tubes. Samples were collected within a 3 ft by 3 ft area. One to three samples were collected within each city street. The background samples were collected using the same methods and equipment. Samples that were collected from construction debris were labeled with the letter "C."

Samples collected for Phase 2 of the data collection were collected from as close to Phase 1 sampling locations as possible. However, it rained for 2 days before sampling was conducted on April 13th, making it difficult to take grit samples from roadsides in some locations due to a lack of drains and flooded streets. For areas that were flooded after the rain, samples were taken as close to the curbside as possible.

Sample Analyses*:* Sample locations were mapped using Google Earth. First, using a ppb RAE Plus Systems Photoionization Detector, volatile organic chemicals (VOCs) were measured in the head space of the centrifuge in parts per billion (ppb) using isobutylene as the calibration gas.

The VOC levels were not analyzed for this paper. Grit lead samples were analyzed for heavy metals using an Innov-X Systems α-4000 hand held X-ray Fluorescence (XRF) analyzer. Although an XRF is accepted as a field screening tool, studies have confirmed handheld XRF analyzers to be reliable[29] within 85% of inductively coupled plasma atomic emission spectrometer (ICP-AES) when sampling for lead.[30] Before use, the XRF analyzer was calibrated each day using a lead plate provided by the manufacturer. The XRF analyzer was able to provide a real-time measurement for several heavy metals (Ag, As, Ba, Cd, Cr, Hg, Pb, Se). Due to time limitations, only data collected for lead was analyzed. For all real-time lead measurements, the grit was poured into a small, 3"x4" plastic sampling bag before using the handheld XRF analyzer. Samples were gathered to one corner of the plastic sampling bag. The XRF was placed on a volume of about a third to half an inch of grit and held to the sample for 24 to 30 seconds. Measurements were recorded onto the chain of custody. The results were reported in parts per million (ppm). Samples collected in Region 9 were sent to Schneider Laboratories, Inc. for analysis. Lead level measurements were provided in ppm.

***Statistical Analysis**:* All statistical analysis was performed using excel and SPSS. A paired t-test was performed to compare the geometric means of samples collected one month and six months after the storm in affected areas. In Phase 2 of the soil survey, a sample was missing from the Coney Island dataset; therefore, samples for that location was excluded from statistical analysis. An independent t-test was performed to compare the means of Phase 1 and Phase 2 samples from affected areas to the unaffected areas. For non-detectable (ND) and limit of detection (LOD), half the lower limit of the LOD was taken as described in EPA's (36) *Guidance for Data Quality Assessment: Practical Methods for Data Analysis*. Independent t-tests were performed to compare Phase 1 and Phase 2 affected areas with unaffected areas and construction debris and non-construction debris containing samples. Then a paired t-test was performed to compare changes between Phase and Phase 2 samples.

Results

Table 1 indicates sample collection sites by site number and region identifier. There were 12 sites and 273 samples. Seven sites were in affected areas in Queens, Brooklyn, and Staten Island, from which 99 samples were collected during Phase 1. Grit samples from unaffected sites were in Manhattan and Bronx, which had 5 sample collection sites and 76 samples. A total of 98 grit samples were collected during Phase 2 from affected sites, however, no samples were collected from unaffected sites during this phase.

Figure 1 shows evacuation zones for NYC. Zone A has a potential of flooding from any hurricane. Figure 1 indicates that all sample collection sites in affected areas were within evacuation Zone A. Table 3 shows the minimum, maximum, median, and the geometric mean of grit lead in all locations given by affected areas in Phase 1 and Phase 2, unaffected areas, and a summary of samples that showed evidence of containing construction debris Samples collected along the bus routes in unaffected areas ranged from 5 to 354 ppm, with a mean value of 80.1ppm, and did not contain any grit samples at or above the USEPA standard for play areas of 400 ppm (Table 3). The median grit lead level in unaffected areas was 70 ppm Samples for unaffected areas were collected during Phase 1 only. Phase 1, ranged from 12 to 2119 ppm, with a mean value of 82.4 ppm (Table 3). Of ~~of~~ grit samples from affected areas, 9.1% contained lead

levels above 400 ppm and 4.0% contained levels above 1200 ppm (Table 2). ~~[rule against starting a sentence with a number]~~

Phase 2 sampling results ranged from 5 to 962 ppm, with a mean value of 51.6 ppm (Table 3). The median grit lead level in affected areas from Phase 2 samples was 74 ppm. From Phase 1 to Phase 2, there was a 6% decrease in the number of samples containing lead; none of the samples from Phase 2 had lead levels at or above 1200 ppm (Table 2). During Phase 1, samples above 400 ppm were collected from Far Rockaway, Breezy Point, and Tottenville (Figure 2). The median grit lead level in affected areas during Phase 1 was 69 ppm. In Phase 1, Breezy Point had the highest median grit lead level (1782 ppm) and Eltingville, Staten Island had the lowest median grit lead level (28 ppm). In Phase 2, lead levels above the EPA play area standard were found in Far Rockaway (962 ppm) and Rockaway Beach (641 ppm), both of which were higher than the previous phase (687 and 248 ppm). There was no significant difference in the geometric means of grit lead levels for Phase 1 ($p=2.40$) and Phase 2 ($p=1.33$) of affected areas when compared to unaffected areas. Breezy Point had the highest grit lead level (2119 ppm) in Phase 1, whereas Coney Island had the lowest (12 ppm). Half the samples collected in Breezy Point were above the federal standard of 400 ppm. Grit lead levels decreased significantly ($p=0.0005$; 95% CI: 25.3, 77.9) from Phase 1 to Phase 2.

Samples were sorted by construction and non-construction debris containing grit. Samples containing construction debris ranged from 23 to 962 ppm, with a mean value of 74.9 ppm. The non-construction debris ranged from 5 to 2119 ppm, with a mean of 63.2 ppm. Grit determined to contain construction debris did not have a significantly higher level of lead ($p=0.78$, independent sample t-test).

Discussion

After Superstorm Sandy, there were no background soil or grit lead levels in NYC for comparison. Samples collected one month and six months post Sandy had lead levels ranging from 12 to 2119 ppm and 5 to 962 ppm. The grit lead levels had decreased significantly from Phase 1 to Phase 2, which was unexpected. Although there was a decrease in mean lead levels, the maximum lead levels in Far Rockaway and Rockaway Beach increased. Although lead levels generally decreased, it is important that a third and fourth set of samples be taken during the dry summer months when more construction is expected and 1 year after the storm for comparison. Samples collected from commercial neighborhoods in Manhattan and Bronx, along SBS routes show that the NYC lead levels are below the EPA standard of 400 ppm in children's play areas, although maximum grit lead levels did reach up to 354 ppm. This shows that NYC background lead levels may be much higher than normal urban lead levels of 50 to 200 ppm.

Initial sampling indicated widespread lead contamination in Breezy Point, not far from where many homes burnt down, During Phase 1, lead levels in Breezy Point, were significantly higher than all other locations, however, maximum grit lead levels went down as low as 91 ppm 6 months after the storm. The decrease in lead may be attributed to the heavy rains and snow over the winter months.

Limitations. A limitation of this study was that background samples, in regions that were in close proximity to affected areas or conducted within the affected areas prior to Sandy were not collected or available for comparison. Another limitation of this study was that Phase 2 samples were not collected along the bus routes in unaffected areas, therefore, any change in the background samples were not tracked. Variations in sampling methods and locations due to weather conditions and previous damaged drains may be a cause of error. A source of error was that not all samples were labeled with the letter "C", even if containing construction debris, especially during the first phase of sampling in Breezy Point, which may have resulted in a high p-value for construction and non-construction debris sample comparison. Therefore, a labeling may be a reason for not seeing a positive correlation with construction debris and grit lead levels.

Lead in soil is a significant public health hazard in the United States, especially in young children. This is the first known study of residential lead hazards in NYC in the aftermath of Superstorm Sandy. Grit lead levels in NYC range from 5 to 962 ppm and the median lead level was 80.1 ppm. This raises concern, as lead levels below 80 ppm have been found to cause a loss of IQ in children. California's OEHHA has already lowered its state soil lead standards to below 80 ppm, whereas NYS has not established its own standard as of yet. This may indicate a need for regulatory change in NY. With an increase in storms, it may be necessary to understand how rebuilding homes after natural disasters can change health hazards such as lead exposure and to truly understand if demolition affects lead levels in grit. Due to time limitations, the VOCs and level of other toxic heavy metals, such as arsenic, were not analyzed. Further research is necessary to understand potential changing hazards in the aftermath of a storm like that of Sandy's magnitude.

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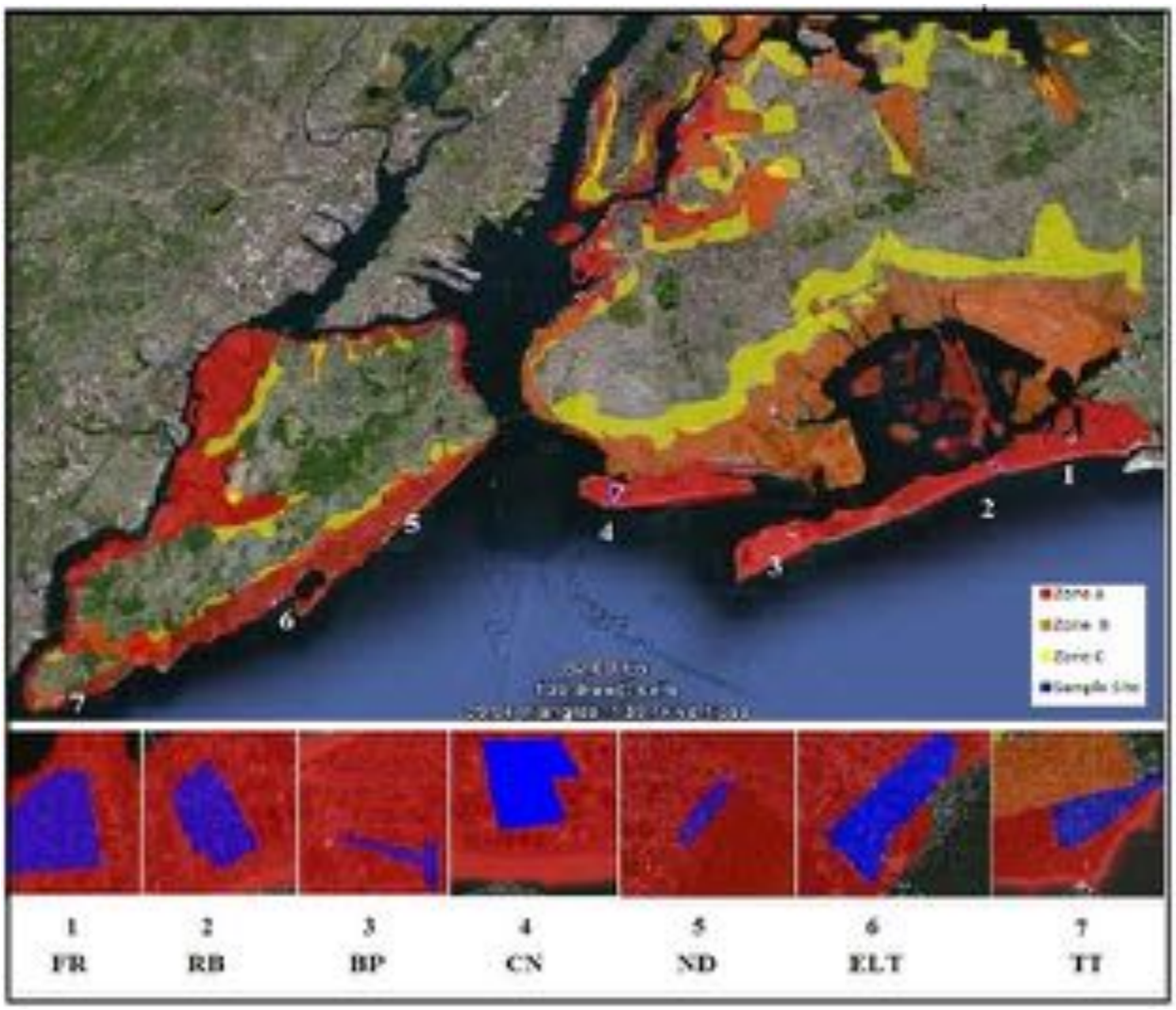
Table 1. Sample collection site by site number and region id with number of samples (n) collected at each site

Site Number	Region ID	Sample Collection Site	Phase 1 (n)	Phase 2 (n)
1	FR	Far Rockaway, Queens	20	20
2	RB	Rockaway Beach, Queens	23	23
3	BP	Breezy Point, Queens	10	10
4	CN	Coney Island, Brooklyn	20	19
5	ND	New Dorp Beach, Staten Island	5	5
6	ELT	Eltingville, Staten Island	9	9
7	TT	Tottenville, Staten Island	12	12
8	Bx12W	Bx12 (westbound)	16	
9	M34A-E	Manhanttan (M34A eastbound)	13	
10	M34W	Manhattan (M34 westbound)	13	
11	M15S	Manhattan (M15 southbound)	20	
12	M15N	Manhattan (M15 northbound)	14	
Total			**175**	**98**

Samples were collected from Far Rockaway, Rockaway Beach, Coney Island, and Staten Island (storm affected areas) and were compared to samples collected in Manhattan and Bronx (unaffected areas). A total of 273 samples were collected from the 12 sample collection sites. Phase 1 of sampling was conducted 1 month after the storm and Phase 2 was conducted almost 6 months after the storm.

Figure 1. Map of NYC evacuation zones indicating sample collection sites



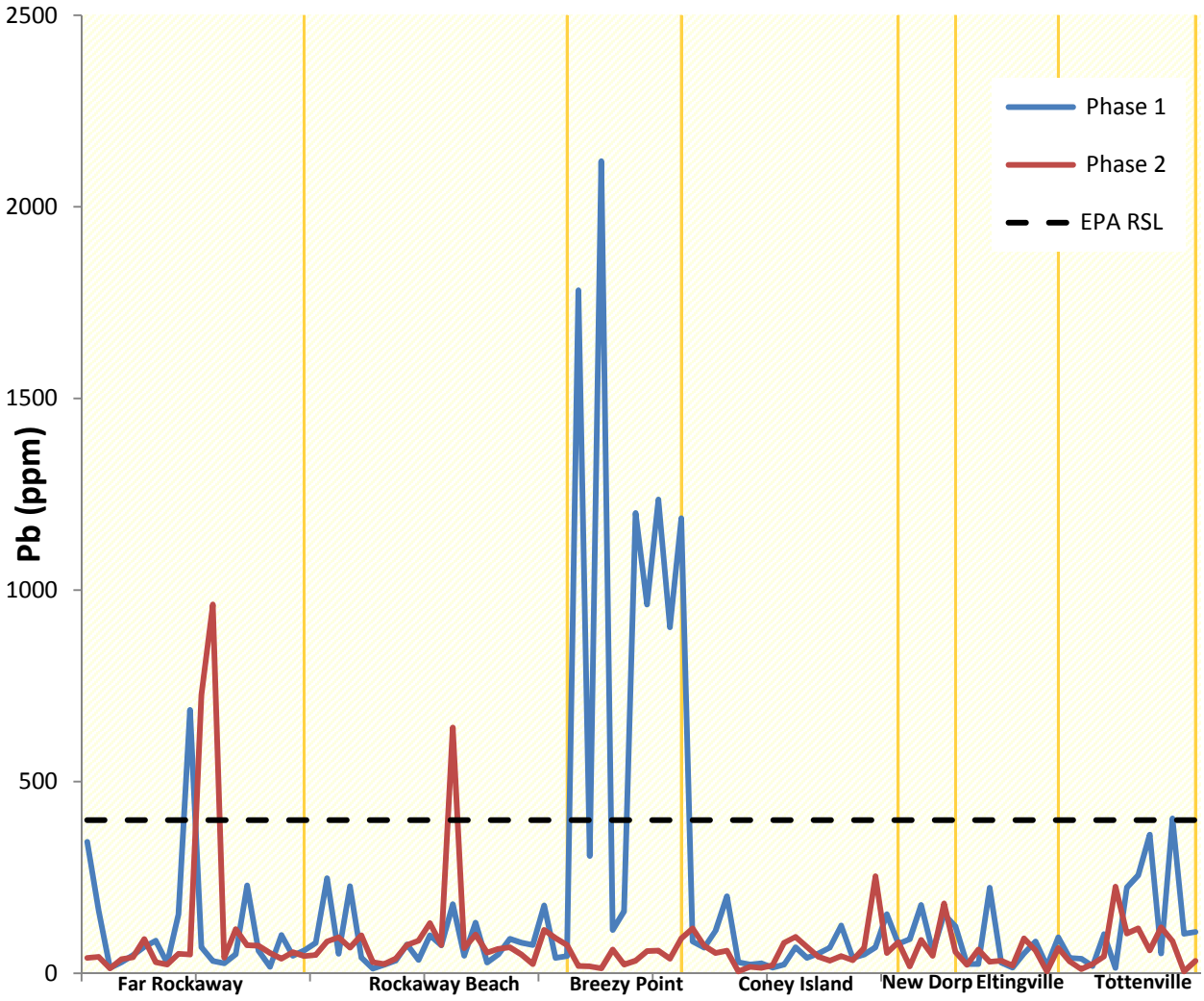
This map was created using Google Earth and WNYC Evacuation Zones map. The map show a rough indication of Zone A (potential flooding from any hurricane), Zone B (potential flooding from category 2+ hurricane), Zone C (potential flooding from category 3-4 hurricane, and sampling sites) and sample collection sites. All samples sites were located within evacuation zone A. Some samples from Tottenville, SI were located in both zones A and B.

Table 2. Fraction of grit lead samplesindicating homes with elevated lead levels [n(%)]

	HUD/U.S. EPA Standard	Phase 1 – Unaffected Areas	Phase 1 – Affected Areas	Phase 2 – Affected areas
Grit sample (n=273)	>400 ppm	0(0.0)	9 (9.1)	3(3.1)
	>1200 ppm	0(0.0)	4 (4.0)	0(0.0)

In Phase 1, grit samples in unaffected areas, along the bus routes show that no samples were found to be over the EPA play and non play area Pb hazard standards. However, 9 samples (9.1%) were found to have Pb levels above the EPA play area Pb hazard standard and 4 (4.0%) samples were found to be above the non-play areas standard of 1200 ppm. In Phase 2, only 3 (3.1%) of grit samples contained Pb in, having a 6% decrease from Phase 1.

Figure 2. Comparison of grit lead levels in Phase 1 and Phase 2 by sample location



In Phase 1, Breezy Point had the highest grit Pb level with 2119 ppm; Staten Island and Coney Island had the lowest grit Pb level, at levels below the limit of Detection (LOD). Most grit samples in Breezy Point had Pb levels higher than the EPA soil play area standard. In Phase 2, Far Rockaway had the highest grit Pb level at 962 pp in Far Rockaway. The graph indicates that grit levels were generally lower during Phase 2 than Phase 1. The geometric mean of grit Pb level in Phase 2 was significantly lower than Phase 1 (p=0.0005; 95% CI: 25.3, 77.9).

Table 3. Summary of number of samples (n), minimum, maximum, and median lead (Pb) concentration (ppm) found in grit samples by areas left affected and unaffected by Superstorm Sandy by phase, both one month and six months after the storm (samples collected November 2012 and April 2013, respectively), as well as samples containing construction debris.

	Affected								Unaffected					
	FR	RB	BP	CN	ND	ELT	TT	All	Bx12W	M34 A-E	M34 W	M15 S	M15 N	All
Phase 1														
n	20	23	10	20	5	9	12	99	16	13	13	20	14	76
Minimum	14	12	113	15	57	15	14	12	5[b]	5[b]	5[b]	28	22	5
Maximum	687	248	2119	201	178	223	404	2119	172	155	259	354	349	354
Median	59.5	73	**1782**[a]	63.5	123	28	102.5	69	48.5	93	157.8	223.9	192.4	70
Geometric Mean				82.4							80.1			
p (t-test) one tailed								2.40						
Phase 2														
n	20	23	10	19	5	9	12	98						
Minimum	13	24	13	14	18	5[b]	5[b]	5						
Maximum	962	641	91	253	182	91	226	962						
Median	47	74	19	56	56	33	52	74						
Geometric Mean				51.6										
p (t-test) one tailed								1.33						

	Construction Debris	Non-construction Debris
n	42	153
Minimum	23	5
Maximum	962	2119
Median	60.5	60
Geometric Mean	74.9	63.2
p (t-test) one-tailed	0.78	

[a]Medians above the USEPA standard for soil Pb in play areas in 400 ppm and 1200 ppm for non-play areas.
[b]All Non-detectable (ND) levels were below 15% of the Lower limit of detection (LOD) which is 10. Half the value of the LOD was taken for these sample measurements (36).

Samples collected one month (Phase 1) after Superstorm Sandy had a minimum of and a maximum of 12 and 2119 ppm of Pb and a median of 69 ppm. Samples collected almost 6 months (Phase 2) after the storm had a minimum of 5 ppm and a maximum of 962 ppm of Pb in grit. For the background samples collected along the bus routes of unaffected areas, the minimum and maximum soil Pb levels were 5 and 70 ppm. In Phase 1, the highest median Pb level was found in Breezy Point, Queens, however, in Phase 2, the median Pb level in Breezy Point was 19 ppm. The geometric mean of affected areas was not significantly higher than that of unaffected areas during Phase 1 of sampling (p=2.40). The geometric mean of samples from Phase 1, 2 and the unaffected areas from Phase 1 was 82.7, 66.3, and 51.6 ppm, respectively. The geometric mean in Phase 1 was significantly higher than the geometric mean in Phase 2 (p=0.0005). A comparison of construction and non-construction debris showed no significant difference (p=1.17).

Appendix

Figure 3. Map indicating lead data sampling in FR, which was affected by Superstorm Sandy.



Figure 4. Map indicating lead data sampling along bus route Bx12W, which was not affected by Superstorm Sandy.



Regional Environmental Characterization of Artisanal Gold Mining Operations in La Cordillera Real, Bolivian Andes, Bolivia:

MS. EOHS
Capstone Paper Review Version 4

Abstract:

Objectives:

Our primary goal was to characterize the regional environmental conditions by analyzing soil metal concentrations at and near ASGM processing centers and villages located throughout the Cordillera Real (Real Mountain Range) of the Andes Mountains. Soil sampling for heavy metals was performed and compared to US Environmental Protection Agency (EPA) Ecological Soil Screening Levels (ESSLs). Our secondary goal was to use soil characterization data to ascertain the hazard risk index of populations residing in proximity to ASGM processing centers to determine whether or not they are at risk.

Methods:

A total of n=88 soil samples and n=211 air samples were collected from one village, two mining processing centers and one concentrated tailing sample (molida) with a Jerome 7405 Mercury Vapor Analyzer and an Innov-X (XRF) Systems analyzer. Data was segregated by location for calculation and interpretation of blood lead levels, heavy metal concentrations, and non-carcinogenic and carcinogenic hazard indices in accordance with EPA Risk Assessment Guidelines. Extent of soil contamination was determined by comparing geometric mean concentrations to ESSLs.

Results:

Concentrations of arsenic, manganese, cobalt, mercury and lead were above ESSLs. Of these mercury and arsenic were of significant concern due to their associated health effects. Mean soil arsenic and mercury concentrations were 997 ppm and 53 ppm respectively. Mean mercury vapor concentration was 3.5 ppm. Regional combined carcinogenic and non-carcinogenic hazard index based primarily on arsenic and mercury exposure was 7.4 for adults and 11.1 for children.

Conclusions:

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Environmental characterization of La Cordillera Real identified concentrations of heavy metals above ESSLs and greater than previously identified concentrations in similar studies within the Andes Mountains. ASGM communities within La Cordillera Real are at high risk due primarily to exposure to high concentrations of arsenic and mercury.

Introduction:

During artisanal and small-scale mining (ASGM), mercury (Hg) is used as an amalgamating agent to bind and extract gold from crushed ore. When gold is extracted from the amalgamation mercury vapor and other heavy metals are dispersed into the environment. There are two primary methods utilized in ASGM. The first is whole ore amalgamation (WOA) and the second is concentrate amalgamation (CA).[1]

Large aggregate material with veins of gold, known as ore, is mined beneath the ground or along mineral rich plutonic outcroppings. The ore is crushed in a tumbler loaded with steel/iron spheres and mixed with Hg, facilitating the first stage of amalgamation. After the crushed ore has been thoroughly pulverized, it is mixed with amended water and allowed to pass through a sluice box or channel with mercury covered copper plates.[2] During the sluicing process, mercury may be accidently spilled on the ground, wiped on clothing, or lost to the environment as mercury flour. Gold rich perrita is mechanically separated from tailings. The perrita is then further refined by panning with mercury or perrita is spread on copper plates lined with mercury to extract sequestered gold. The amalgam is then dried and crudely burned. The burning is performed with blow torches or large pyres . Since the boiling point of mercury is lower than that of gold mercury to evaporates into the atmosphere leaving behind gold.[2] These gold "chips" are sold to smelters who then refine the gold and pour ingots. During this entire process the mercury is often manipulated by hand with no personal protective equipment.

ASGM leads to large quantities of silt and sediment contaminated with chemicalsand metals such as arsenic, lead, and mercury. In South America, ASGM has been common in countries such as Brazil, Venezuela, Colombia, Bolivia, French Guyana, Guyana, Ecuador, and Peru since the 1980s, where unskilled miners first used greater quantities of mercury to increase

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gold recovery. [4] Our primary goal was to characterize the regional environmental conditions by analyzing soil metal concentrations at and near ASGM processing centers and villages located throughout the Cordillera Real (Real Mountain Range) of the Andes Mountains. Soil sampling for heavy metals was performed and compared to US Environmental Protection Agency (EPA) Ecological Soil Screening Levels (ESSLs). Our secondary goal was to use soil characterization data to ascertain the hazard risk index of populations residing in proximity to ASGM processing centers to determine whether or not they are at risk.

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Methods:

Site Description:

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Air and Soil Sampling:

A total of 88 soil measurements were collected at two mine processing sites and one village. Soil measurements were collected with an Innov-X (XRF) Systems analyzer. Specific metals sampled were titanium, manganese, iron, cobalt, zinc, arsenic, rubidium, strontium, zirconium, mercury, and lead. Samples collected at the mine processing center were representative of day-to-day work tasks performed including mining, loading, panning, sifting, trommel operation, equipment repair, and on site living quarters. Soil sampling in the surrounding village was performed within random areas where children were observed playing, such as the clinic, school yard, and adjacent open spaces.

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Airborne mercury (n=211) samples were collected with a Jerome 7405 Mercury Vapor Analyzer for periods of 16 seconds at each sample locations.

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Molida

Molida is the amalgamated material that is extracted from within the trommels and mercury lined sluice channels. This material is removed by hand or with simple hand tools. Molida is processed further by either panning or concentrating on a mercury coated copper plate.

Two (2) molida samples were collected from the excess spill over material beneath a secondary trommel at the Yani processing center. Sample was analyzed once per day over the course of eight days. Resulting molida sample analysis and soil data maxims were utilized to assess waste stream characteristics.

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Risk Assessment:

A risk assessment of potential metal exposure was conducted in accordance with standard US Environmental Protection Agency (EPA) risk assessment guidance for noncancerous health endpoints. Exposure routes included dermal, incidental ingestion, and inhalation pathways. According to the Exposure Factors Handbook, the average daily dose (ADD) as measured in mg/kg day for an element via ingestion, inhalation and dermal exposure pathways can be estimated using Equations (1), (2) and (3) respectively:[5,6]

Equation 1:

$$\text{ADD ingestion} = \frac{C*IngR*EF*ED}{BW*AT}$$

Equation 2:

$$\text{ADD inhalation} = \frac{C*t*InhR*EF*ED}{BW*AT}$$

Equation 3:

$$\text{ADD dermal} = \frac{C*SA*AF*ABS*EF*ED}{BW*AT}$$

Where:

C = Element concentration (mg/kg)
IngR = Ingestion rate (mg/day)
IngR = Inhalation rate (m^3/m^3)
ABS = Dermal absorption factor
AF = Skin adherence factor (mg/cm^2per hour)
SA = Exposed body surface area (cm/hr)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight of exposed population (kg)
AT = Average time (days)
T = exposure time (hours/day)

Measurements below the limit of detection were replaced with the $\left(\frac{1}{sqrt2}\right) * LOD$. Since the data was highly right skewedgeometric means were used to calculate risk estimates. Analysis for ADD was stratified into two groups, children age 0 – 17, and adults age 17 – 30. Exposure estimates for indigenous populations were used for our risk assessment: 400 mg/day incidental ingestion rate for all age groups and 30 m^3/day inhalation rate for adults.[7] US EPA recommended inhalation rates ranging from 3.6 to 15.2 were used for age groups 0 - 17.[5] Body weight inputs as defined in the USEPA's Exposure Factor Handbook were used for our calculations. 10kg for ages 0-1, 15 kg for ages 2–6, 30 kg for ages 6– 17, and 70 kg for ages 17–30.

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Based on calculated ADD's, non-cancerous hazard quotients (HQ) were calculated using Equation 4 and 5.[5] Metals selected for analysis were arsenic, cobalt, manganese and mercury.

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Reference doses (RfD) and reference concentrations (RfC) were obtained from the US EPA's Integrated Risk Information System (IRIS). Where RfD's or RfC's were not established by the USEPA, recommended RfD's and RfC's were obtained from the Agency for Toxic Substances Disease Registry (ATSDR) and the EPA's National Center for Environmental Assessment (NCEA). To communicate cumulative non-carcinogenic risks due to multiple routes of exposure, a total exposure Hazard Index (HI) was calculated using Equation 6.

Equation 4:

$$HQ = \frac{ADD}{RfD}$$

Equation 5:

$$HQ = \frac{ADD}{RfC}$$

Equation 6:

$$HI = \sum_1^i HQ$$

In addition to manual calculations for incidental ingestion rates and risk, the Risk Assessment Information System Preliminary Remediation Goals (RAIS) Calculator, developed

by the Oak Ridge Operations Office, was utilized to calculate non-carcinogenic dermal and inhalation risks based on volatilization factors (VF) and particulate emission factors (PEF) using default presets for both equations. Surface area for VF and PEF was corrected to 1 – 2 acres based on observed site conditions. Non-carcinogenic and carcinogenic hazard indices were added to provide a total hazard index for selected sites and exposure to selected metals.

The USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) model was used to blood lead levels (BLL) at all sites Only soil concentrations were used to estimate pediatric BLLs Analysis was stratified by one year increments from birth to the age of 6 years. For the purpose of simpler interpretation, estimated BLL's were aggregated into age segments, 0 – 2 and 2 – 6 years of age.

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Results:

Soil descriptive statistics are shown in Table 1.A total of n=18 soil samples were collected throughout the school yard and clinic in the village of Ingenio. Mean values for arsenic, mercury and lead were 801 ppm, 74 ppm, and 41 ppm respectively, maximum concentrations of 5,903 ppm, 658 ppm, and 201 ppm were observed. (Table 1). A total of n=35 soil samples were collected throughout the YMCP. Maximum arsenic, mercury and lead concentrations of 137,022 ppm, 737 ppm, and 789 ppm, respectively, were detected along the perimeter and delta of constructed concrete channels designed to divert excess water and waste spillage. (Table 1) A total of n=23 soil samples were collected throughout the DMPC. Maximum arsenic, mercury and lead concentrations of 80,605 ppm, 29,483 ppm, and 575 ppm, respectively, were detected along a series of unprotected culverts where runoff and spillage was diverted. (Table 1)

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A total of n=33 air samples were collected from YMCP. Samples were collected from locations believed to be representative of work processes and areas of habitual use during the course of artisanal gold mining operations. Due to the nature of our environmental sampling, significant right skew was observed in the data. Average mercury vapor concentrations were calculated to be 13.58 ppm whereas the geometric mean was 2.78 ppm. (Table 3) Maximum recorded concentrations of 186.73 ppm mercury was observed within the workshop where miners

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blowtorch amalgam. (Table 3) A total of n=61 air sampling points collected within frequently occupied, outside areas, collected at height of approximately 3 feet, yielded average concentrations of 1.994 ppm. With a minimum of 0.51 ppm and max 7.95 ppm. A total of n=117 air samples were collected throughout DMPC, village, and homes. Samples were collected from locations representative of work processes and areas of habitual use during the course of artisanal gold mining operations. Average mercury vapor concentrations were calculated to be 9.44 ppm whereas the geometric mean was 5.77 ppm. Maximum recorded concentrations of 55.33 ppm mercury was observed throughout what appeared to be the panning and burning section of the facility. (Table 3)

Calculated average daily dosage for dermal, ingestion and inhalation exposure can be examined in table 4. Within the village of Ingenio, calculated HI's for children due to incidental ingestion of arsenic was 2.97. Based on estimated volatilization of soil mercury, calculated inhalation HI for children within Ingenio village was 3.5. Calculated HI's for children due to incidental ingestion of arsenic risk was calculated to be 1.34. While significantly elevated concentrations, >25 ppm were detected within the foreman's living quarters and the storage shed. HI based on volatilization and suspension of mercury contaminated soils within the mine was 6.31. In addition, combined carcinogenic and non-carcinogenic inhalation risk based on directly observed mercury vapor concentrations, averaging 13.583 ppm, were calculated to be 4.57. Two samples were collected for analysis. Sample concentrations were measured once a day while wet and dry over the course of 8 days. Minimum concentrations for all tested metalloids were detected while the molida was wet. Mean concentrations of arsenic, mercury and lead were measured to be 47,752 ppm, 116 ppm, and 586 ppm, respectively, with maximums of 86,863 ppm, 190 ppm and 959 ppm. Molida is a representative of a cross section of waste discharge in the sluicing process. Maximum contaminant concentrations collected from tailings at sampled sites was averaged with molida sampling results to establish a representation of tailings being discharged into the environment as a result of ASGM. HI derived from volatilization and

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suspension of mercury contaminated soils within the mine was 6.9. Based on collected air and soil data, children living in Ingenio are 11 times more at risk of developing adverse health effects from exposure to all measured environmental contaminants, with a significant portion of that risk, 8.0, being attributed solely to mercury exposure. For adults the HI value was 8.0. However this is a conservative estimation as nearly all residents engage in some type of gold processing work, whether it be mining, sluicing, burning amalgam or similar other jobs where exposure rates have been demonstrated to be higher than baseline outdoor conditions.

References to estimated blood lead levels can be observed within table 5. Modeled blood lead levels were calculated for two age groups, 0 – 2 and 2 – 6. Modeled BLL's were 1.1 and 0.8 respectively. (Table 5)

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Discussion

ASGM is associated with significant rates of mercury intoxication.[12] As calculated by our risk assessment, adults working at Yani and Dorado are 14 and 9 times at risk of developing adverse health effects in their lifetime. Chronic and acute mercury exposure impact the central nervous system, endocrine system and pulmonary systems to varying degrees of toxicity.[20] Acute exposure to inhaled mercury can cause bronchitis and interstitial pneumonitis, and in extreme cases can be accompanied by tremors and severe neurological disorders.[20] Indoor metallic pollution rates are correlated to outdoor concentrations and in the case of mining, significantly increased in part to inadequate doffing of work clothes which leads to increased transport of contaminants into the home.[24,25]

Commented [BP22]: Check to see interpretation. Not sure if you can say 9 to 14 x higher

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Clusters of mercury contamination were detected in areas associated with direct use of mercury in ASGM. Maximum mercury concentrations of 737 ppm were detected in soil beneath

the tumblers, where workers pour mercury to facilitate raw ore amalgamation. During the filling and cleaning process, mercury flour and tailings are spilled and dispersed throughout the processing site and village by incidental transportation. As has been previously documented, contaminated waste inevitably makes its way from the workplace to the surrounding environment during artisanal extraction of gold. [11,12] Our data demonstrated concentrations as high as 137,022 ppm of arsenic and 789 ppm of lead. GIS interpolation of the Yani mine illustrates the distribution of mercury and arsenic soil concentrations. Total hazard indices derived from geometric means of heavy metals at YMPC were above 1.0 and denote a potential for the development of adverse health effects.

Whereas YMPC was tightly arranged and isolated from the village, the DMPC extended approximately 200 feet across and was located 20 feet from the village without any form of protective barrier or delineation. Soil concentrations measured as high as 80,605 ppm, 29,483 ppm, 575 ppm and 3,422 ppm for arsenic, mercury, lead and cobalt respectively. Children and adults were observed engaging in recreational activity within areas identified as having metal concentrations above recommended ESSLs. Without a distinct separation, it is assumed that children and adultswere exposed to contaminated soil . Hazard quotients indices for DMPC were above 1.0 and denote a potential for the development of adverse health effects. Soil metal concentrations within the village were sufficient to pose a hazard to children and adults. Individuals residing in proximity of the DMPC live in an area where they are 9 times more likely to develop adverse health effects due to chronic exposure.

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Since many ASGM operations are familial, and women participate in the process by burning amalgam in their homes, the elevated concentrations within the village may be attributable to this process. A study performed in Mali, found that children as young as 6 years old were seen digging mine shafts, carrying and crushing stone, and panning for gold alongside adults.[16] The study also found that between 20,000–40,000 children from that country work in gold mining, and that many among them carry out amalgamation, which can result in protracted exposure to mercury vapor.[16,23] Total calculated mercury HI to children for region the 11.1. Children exposed to combinations of organic and inorganic mercury are at risk of developing adenopathy, gingival discoloration and dermatological abnormalities.[23] In addition, children

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exposed to inorganic mercury grow with developmental deficiencies due to cognitive dysfunction and mercury's destruction of neural communication pathways.[22]

A previous study found ASGM health effects are not limited exclusively to mercury; arsenic, cadmium, chromium, and other heavy metals have been measured at elevated concentrations surrounding industrial facilities and mining sites. [27] In the present study large concentrations of arsenic were detected throughout the study region. This is likely due to thr combination of environmental contamination and unknown geological conditions, Previous studies have demonstrated environmental arsenic availability correlates to bioavailability. Urinary arsenic concentrations have been demonstrated to correlate with arsenic concentrations in soil.[31] Arsenic concentrations ranging from 99 ppm to 9136 ppm corresponded with a 58% reporting rate for dermatological symptoms consistent with arsenicosis.[28] Compared measured arsenic in that study our results were higher (range: 801-8,944 ppm).. In addition, as has been shown with mercury, heavy metals such as arsenic are also easily transported into the ecological distribution chain and make their way into the water supply and food consumption pathways.[29,30] Our results yielded waste stream As concentrations averaging 77,396 ppm, and are likely contributing to the dispersal and amplification of As throughout the region.

Additionally, chronic exposure to cobalt has been shown to cause cardiovascular failure, liver failure, allergic dermatitis and gastrointestinal distress.[32,33]And while the EPA has yet to set forth a RfD or RfC, the EPA's National Center for Environmental Assessment has established a dose recommendation of 0.002 ppm. The collective contribution of risk from Co and Mn were below 1.0.

In conjunction with our environmental characterization, our colleague Dr. Jean Grassman performed medical surveys and conducted medical screenings of representative residents of the mining community. Preliminary analysis showed 17% of the men (n=11/89), 25% of the women (n=6/24), and 25% of the children (n=5/21) were found to have levels greater than 25ug/l mercury in urine. Individuals surveyed were from the surrounding mining communities. These results require further inquiry before establishing any relationships.

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Waste Stream Characterization:

ASGM tailings are comprised mainly of fine particles and fit the chemical profile of the geographic region where the bulk ore is mined. Molida is a good indication of ASGM tailings as it is found directly beneath processing and sluicing equipment. To better represent the general regional characteristics of tailings, maximum measured metal and metalloid concentrations observed at each site were averaged in conjunction with molida concentrations and can be seen in table 6. These samples were collected from soil predominantly layered with tailings and waste. Our data show arsenic concentrations ranging from 5,093 ppm within Ingenio village to 137,022 ppm. Isolating the data to represent worse case concentrations across all sites, or those identified as waste tailings, yields an average concentration of 77,395 ppm of arsenic, 712,976 ppm iron, 16,858 ppm manganese, 7,767 ppm mercury, and 616 ppm lead. For comparison, in an examination of two ASGM facilities located within the Bolivian Andes Mountains, surface soil concentrations were analyzed and their results yielded soil concentrations of 14.5 ppm near incineration areas and 0.17 ppm at control sites.[13] Our findings demonstrate mean environmental concentrations of heavy metals throughout the studied region were elevated in comparison to nearly every established ecological soil screening level. Previous studies have shown that abandoned sites contained elevated levels of secondary environmental contaminants such as iron, manganese, lead, cadmium and arsenic.[14,153] Soil lead levels within the region were below recommended ESSLs. All estimated blood lead levels were below CDC recommended <10ug/dl for children at all sites.

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ASGM communities do not employ best practice methods and generally there are no encatchment basins, settling tanks, or primary filtration methods employed. The lack of these control methods can lead to the release of mercury flour, which is fine sediment embedded with small (<1mm) mercury particles, into the environment.[2,16] This mercury flour can migrate into the river and lakesediment and damage the aquatic environment. In addition, mercury vapor can be released into the environment and settle on plants, soil, and nearby waterways.[9,17,18]

Since the gold processing sites are often located in residential areas, metal exposure is not limited to only ASGM workers. Children and adults living in the communities near mines can be exposed through multiple routes. Residents not directly exposed to fumes or contaminated dust are still at risk of ingesting mercury that has migrated into the waterways contaminating fish

stocks[11,12,19] Although this is a concern this routes was not considered due to the complex nature of metabolic transformation of methylmercury and its subsequent transportation and bioaccumulation throughout the food chain.[17,20,21] Observations noted throughout all studied sites confirmed what currently exists in the literature. Little to no protective measures were employed in the design of the processing sites. In the case of the Dorado site, runoff from the sluices, trommels, panning, and cleaning were readily observed flowing freely along the village.

Area air sampling at the Yani mine processing center identified three distinct "hot" zones, the garages where amalgam burning is performed (mean?=187 ppm), the repair shop (46 ppm) and the foreman's bed (19 ppm). With the exception of the foreman's living quarters, these hot zones corresponded with measured soil "hot zones". Elevated mercury vapor concentrations in the presence of moderate soil mercury concentrations within the foreman's home is likely due to the transference of mercury flour on clothing, hair, and skin to his living quarters. as studies have demonstrated adsorption rates of 0.1 to 0.2 microgram per 100 square centimeters, or roughly 20 – 40 micrograms total. Over time, mercury flour will accrue on the cloth bed sheets, blankets, and mattress. The associated risk with burning amalgam has been thoroughly studied and the detection of concentrations as high as 187 ppm within the vicinity of a retort not in operation within the repair shop at YMPC supports the notion that exposure to mercury vapor continues well beyond the act of burning.

Study Limitations and Lines of Further Inquiry:

Based on our site observations, trommel operators were observed to be responsible for the preparation, loading, and cleaning of the trommels as well as the sluicing tables. Miners were observed working within the mines as well as the amalgamation process. It should be noted that all worker uniforms were visibly stained with site dust and silvery residue. This may be a potential source of mercury vapor exposure and should be given further consideration in future studies.

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While our study focused on the environmental characterization of multiple sites throughout the Bolivian Andes, our study was limited to soil and air concentrations. The elevated presence of these contaminants in conjunction with Dr. Grassman's findings regarding local population health indicators, necessitates the need for further comprehensive characterization of all contamination pathways including food and water. High inorganic mercury directly correlates to organic mercury concentrations.[9] Environmental impacts of these high mercury concentrations are observable in the soil, water and also in the flora and fauna as organic methylmercury.[9] The presence of mercury in water is a persistent concern when examining the impacts of ASGM. High quantities of dissolved mercury are commonly found in water samples collected near ASGM runoff basins. One such study conducted in the Philippines determined that concentrations of mercury were up to two orders of magnitude above natural background levels, and at concentrations far above World Health Organization (WHO) guidelines.[19] On the extent of pulverization and amalgamation, tailings vary in size. It is not uncharacteristic for tailings to be comprised of particles ranging from <50um to 500um.[34] A particle profile was not performed as part of our characterization and requires further study to better ascertain the degree of silt deposits within the waterways.

As noted previously, the presence of elevated heavy metals also requires further research. The interrelated effects of exposure to multiple metals across multiple exposure pathways must be fully assessed and correlated to actual human derived data in order to comprehensively characterize exposure, dose, and health risks within ASGM communities in the Bolivian Andes.

Due to industry informality, there is little knowledge regarding best practices at the local level, which puts the community at risk. Non-industrial and individual purchases of mercury is illegal in most countries, however imports are routinely diverted and sold in informal markets. These circumstances pose a set of physical hazards via violence and imprisonment. The mining sites are usually abandoned once the gold ore has been worked out. Usually there are no formal clean up or containment procedures for waste at ASGM sites. If these sites were located within the United States, they would easily qualify as National Priority Sites. There are thousands of abandoned small-scale mining sites worldwide, of which many if not all have a history of mercury pollution and widespread health impacts.[3,9,28,35] Perhaps if steps can be taken to

adequately assess, catalogue, and transition out of amalgamate processing, environmental contamination can be reduced and risks minimized.

List of Tables and Figures:

Table 1:

Measured soil data statistics. All sites (n=88 and n=211)

		As	Co	Mn	Hg	Pb
Ingenio Village	Mean	801	1166	6269	74	41
	Median	167	427	326	18	31
	Min	36	241	154	14	12
	Max	5093	6848	57326	658	142
	Std. D	1514	2034	17367	153	39
	Geomean	239	583	534	31	30
		As	Co	Mn	Hg	Pb
Yani Mine Processing Center	Mean	8944	811	495	126	171
	Median	1429	395	397	34	94
	Min	77	252	174	14	20
	Max	137022	9279	3089	737	789
	Std. D	24371	1534	487	179	183
	GeoMean	1783	518	411	58	100
		As	Co	Mn	Hg	Pb
Dorado Mine Processing Center	Mean	5208	433	673	1430	62
	Median	402	245	370	23	28
	Min	9	42	71	10	8
	Max	80605	3422	6316	29483	575
	Std. D	16961	679	1272	6125	119
	GeoMean	318	263	361	56	32
		As	Co	Mn	Hg	Pb
Molida (Concentrated Waste)	Mean	47752	4209	404	116	586
	Median	38999	4217	371	101	529
	Min	25844	2662	181	73	256
	Max	86863	5995	702	190	959
	Std. D	22878	936	219	45	270
	GeoMean	43359	4117	350	109	531
		As	Co	Mn	Hg	Pb
Regional Average	Mean	9982	1107	1772	471	153
	Median	748	385	377	29	44
	Min	9	42	71	10	8
	Max	137022	9279	57326	29483	959
	Std. D	22927	1750	8191	3192	216
	Geomean	997	537	413	53	66

Commented [BP38]: Need to edit table 1. Include number of samples collected at each site. Also need units. For the Molida. You only took two samples so you don't need descriptive statistics

Table 2: Soil metal characterizations of studied sites and regional average as compared to ecological soil screening limits.

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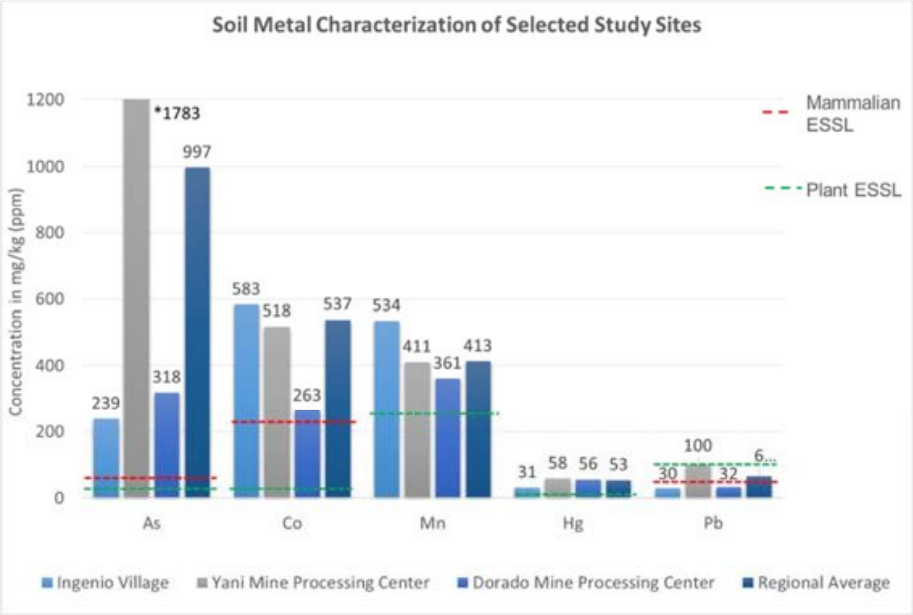

Mean environmental concentrations as compared to established ecological soil screening levels in mg/kg

Analyte	Invertebrate SSL	Mamallian SSL	Plant SSL	Ingenio	Yani	Dorado	Molida
As	na	46	18	801	8944	5207	47752
Co	na	230	13	1166	810	433	4209
Pb	1700	56	120	41	170.53	62	586
Mn	450	4000	220	6269	495	673	404
Hg	0.1	na	0.3	74	126	1429	164
Zn	120	79	160	123	128	823	436

Table 3
Measured HG air concentration data statistics

Location	Mean	Std. D	Geometric Mean	Geo. Std. D	Min	Max	Range
Ingenio Village	1.994	1.916	1.373	2.275	0.510	7.950	7.44
Yani Mine	13.583	34.590	2.773	4.807	0.510	187.240	186.73
Dorado Mine	9.444	10.149	5.766	2.799	0.510	55.840	55.33

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Table: 4
Non Carconogenic and Carcinogenic Geomean Daily Dose (ADD) and calculated Hazard Quotients (HQ's) of metals and metalloids throughout surveyed locations based on soil metal and metaloid concentratons as established by RAIS Calculator

Location	Metal	ADD mg/kg/day						Hazard Quotient					
		Ingestion		Dermal		Inhalation		Ingestion		Dermal		Inhalation	
		Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult
Ingenio Village	As	0.009	0.001	0.000	0.000	0.000	0.000	2.968	0.384	0.756	0.126	3.370	3.370
	Co	0.013	0.002	-	-	0.000	0.000	0.000	0.000	-	-	0.087	0.087
	Mn	0.070	0.009	-	-	0.000	0.000	0.498	0.064	-	-	0.009	0.009
	Hg	-	-	-	-	0.001	0.001	-	-			3.470	3.470
Yani Mine	As	0.004	0.001	0.002	0.000	0.000	0.000	1.336	0.173	5.640	0.942	0.099	0.099
	Co	0.009	0.001	-	-	0.000	0.000	0.000	0.000	-	-	0.072	0.072
	Mn	0.005	0.001	-	-	0.000	0.000	0.039	0.005	-	-	0.007	0.007
	Hg	-	-	-	-	0.002	0.002	-	-		-	6.310	6.310
Dorado Mine	As	0.002	0.000	0.000	0.000	0.000	0.000	0.548	0.071	1.010	0.168	0.018	0.018
	Co	0.005	0.001	-	-	0.000	0.000	0.000	0.000	-	-	0.037	0.037
	Mn	0.007	0.001	-	-	0.000	0.000	0.053	0.007	-	-	0.006	0.006
	Hg	-	-	-	-	0.002	0.002	-	-	-	-	6.860	6.860
Molida	As	0.014	0.002	0.041	0.007	0.000	0.000	4.565	0.590	1.342	0.264	0.058	0.058
	Co	0.047	0.006	-	-	0.000	0.000	0.000	0.000	0.859	0.169	0.495	0.495
	Mn	0.004	0.001	-	-	0.000	0.000	0.032	0.004	-	-	0.006	0.006
	Hg	-	-	-	-	0.003	0.003	-	-	-	-	15.100	15.100

Table 5

Estimated blood lead level via Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK)

Location	Age Range	BLL
Ingenio Village	0 - <2	1.1
	2 - <6	0.8
Yani	0 - <2	0.8
	2 - <6	0.6
Dorado	0 - <2	0.8
	2 - <6	0.6

Table 6: Elemental hazard indices for children throughout surveyed locations based on soil concentrations

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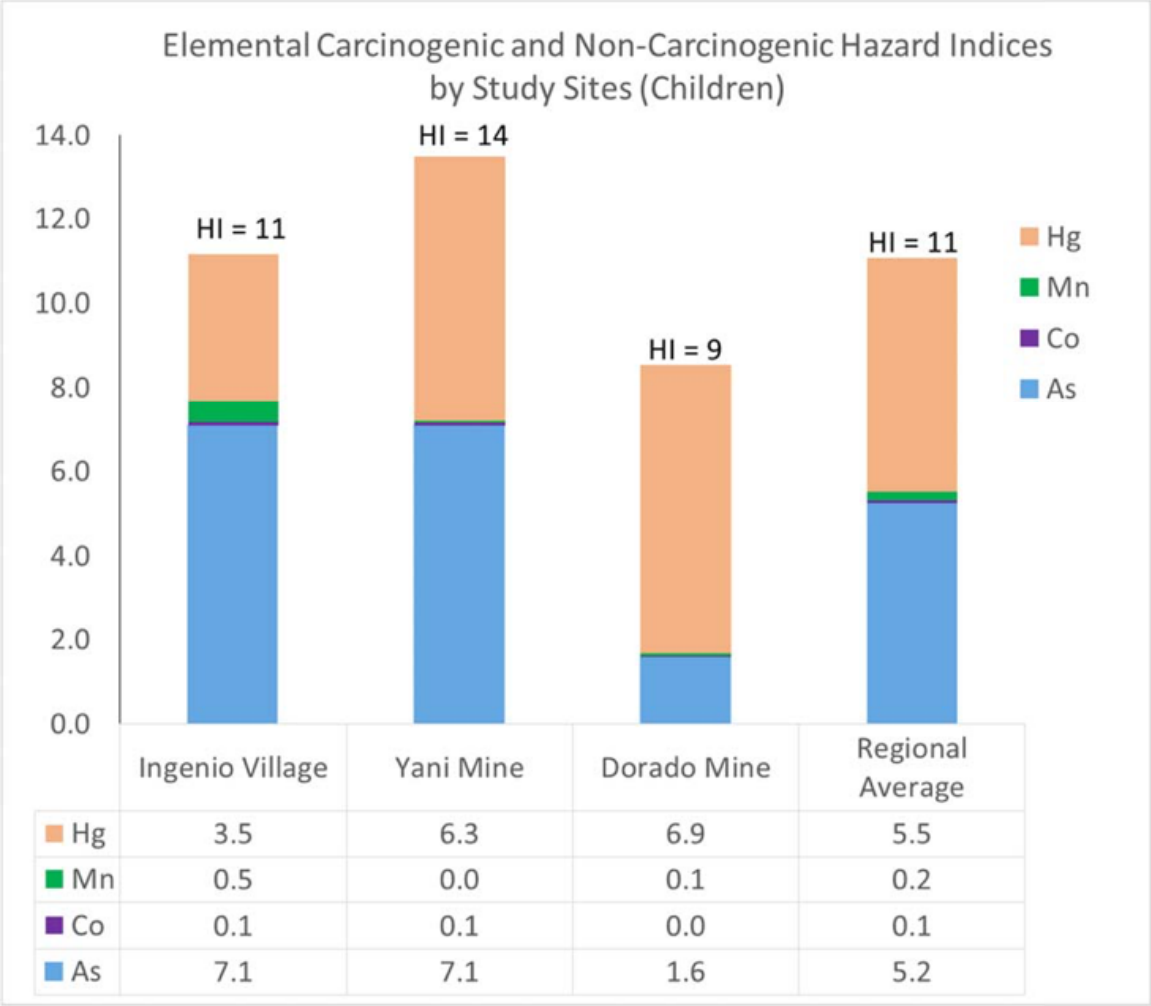

	Ingenio Village	Yani Mine	Dorado Mine	Regional Average
Hg	3.5	6.3	6.9	5.5
Mn	0.5	0.0	0.1	0.2
Co	0.1	0.1	0.0	0.1
As	7.1	7.1	1.6	5.2

Table 7: Elemental hazard indices for adults throughout surveyed locations based on soil concentrations

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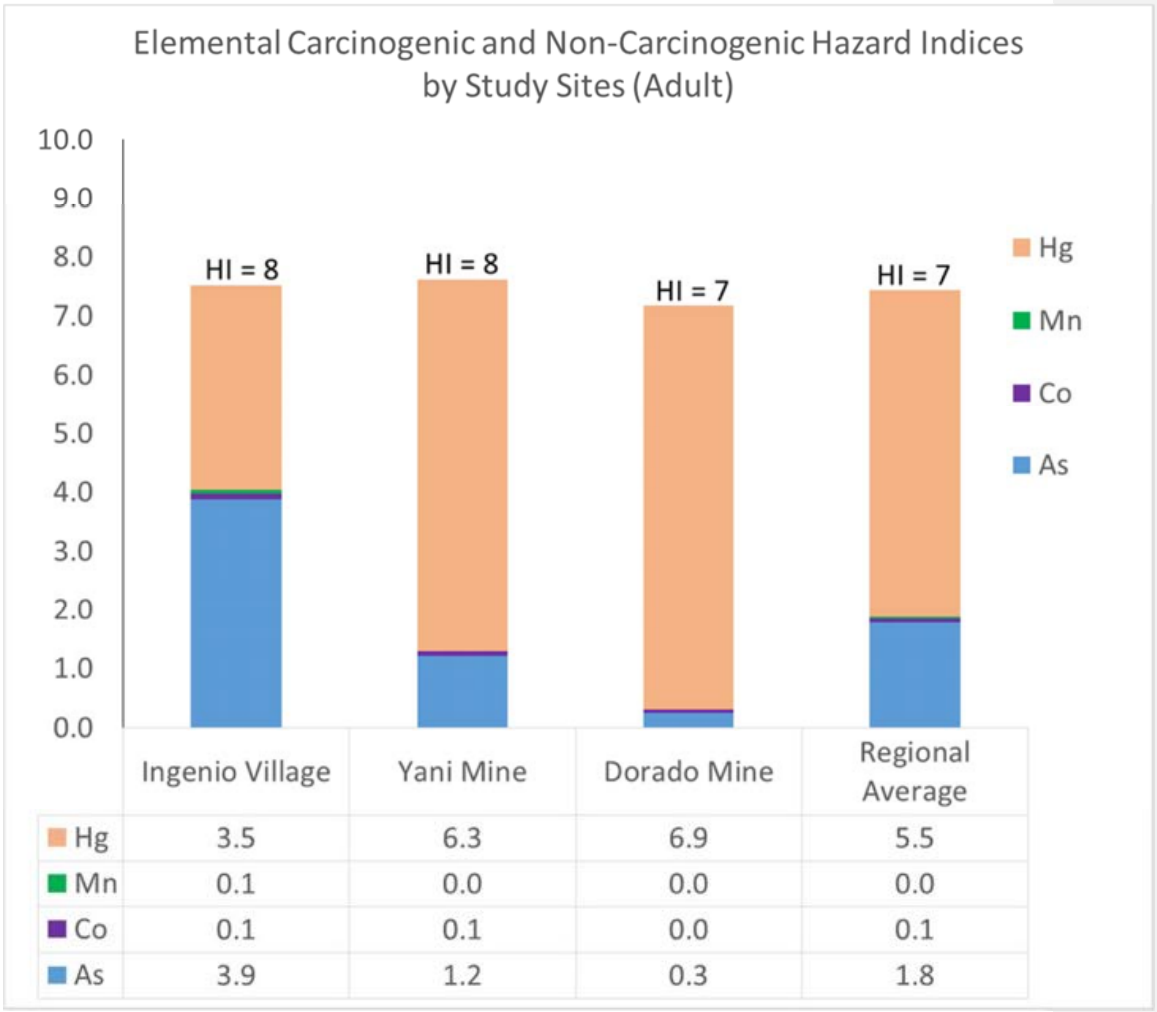

	Ingenio Village	Yani Mine	Dorado Mine	Regional Average
Hg	3.5	6.3	6.9	5.5
Mn	0.1	0.0	0.0	0.0
Co	0.1	0.1	0.0	0.1
As	3.9	1.2	0.3	1.8

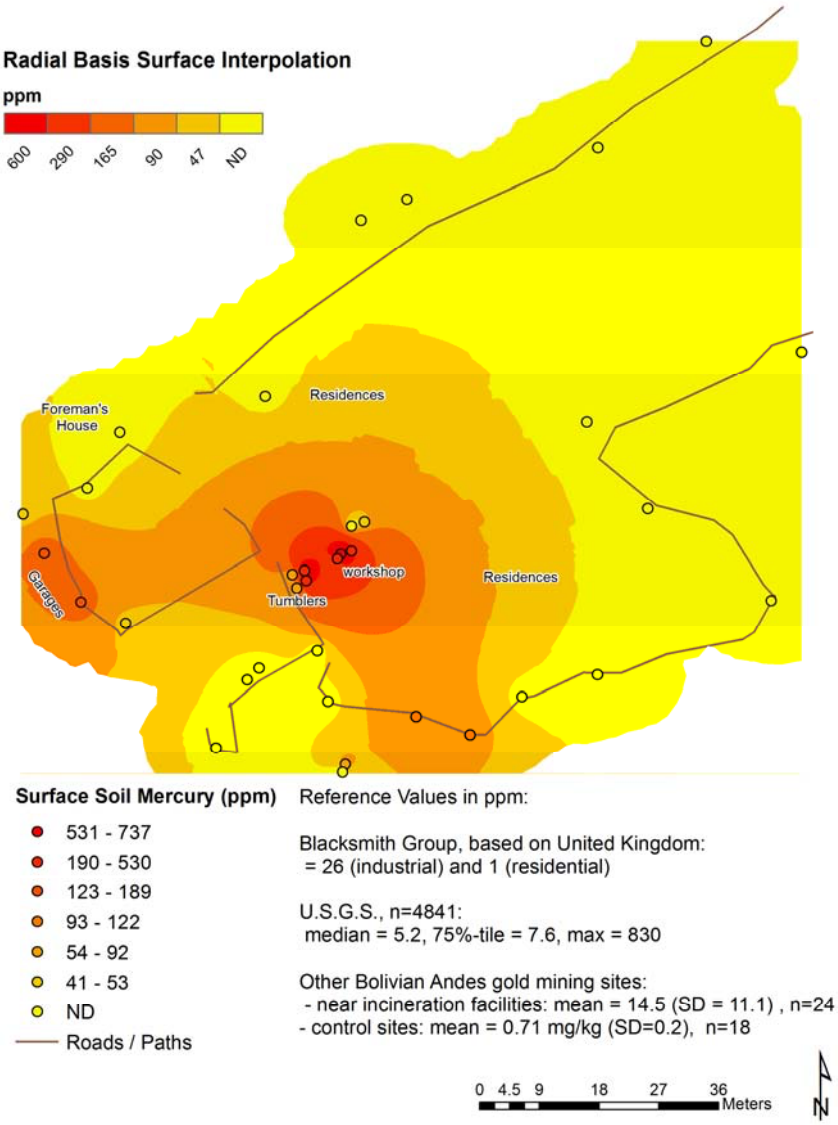

Figure 1: Surface soil mercury levels at mine site 1 (Yani Mine), overlaying an interpolated virtual surface of mercury concentrations based on the radial basis algorithm. Reference values provided to assist interpretation. (Dr. Glen Johnson)

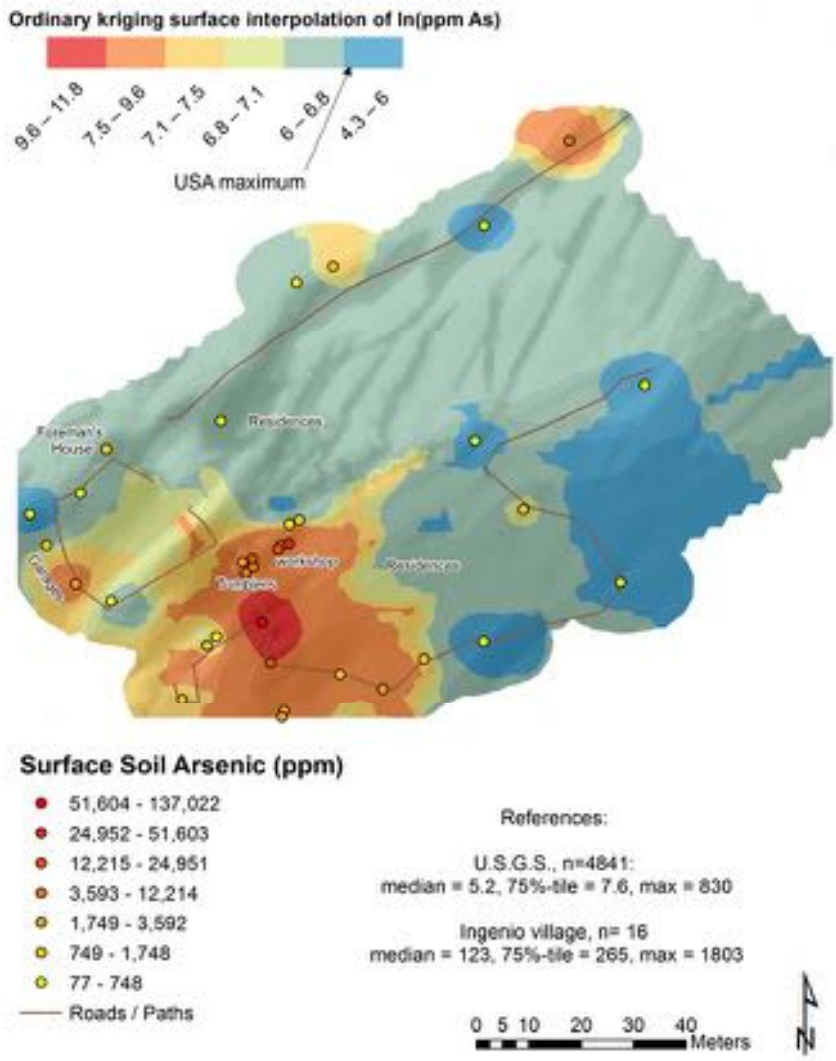

Figure 2: Surface soil arsenic levels at mine 1 (Yani mine). Prediction surface in natural log units, overlaid with sample locations showing original measurements in mg/kg (ppm). (Dr. Glen Johnson)

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ENVIRONMENTAL REGIONAL ENVIRONMENTAL CHARACTERIZATION OF ARTISANAL GOLD MINING OPERATIONS IN LA CORDILLERA REAL, BOLIVIAN ANDES, BOLIVIA:

City University of New York: Hunter College - Environmental and Occupational Health Sciences (EOHS) Master of Science Capstone Paper

MS EOHS

Abstract:

Objectives:

Our goals were to characterize regional environmental conditions and ascertain hazard risk indices of populations residing near ASGM processing centers and villages located throughout the Cordillera Real of the Andes Mountains. Soil sampling for heavy metals was performed and compared to US Environmental Protection Agency (EPA) Ecological Soil Screening Levels (ESSLs).

Methods:

A total of n=84 soil samples were collected from multiple sites. Data was segregated by location for determination of blood lead levels, heavy metal soil concentrations, non-carcinogenic and carcinogenic hazard indices in accordance with EPA Risk Assessment Guidelines.

Results:

Concentrations of arsenic, manganese, cobalt, mercury and lead were above ESSLs. Mean soil arsenic and mercury concentrations were 997 ppm and 53 ppm respectively. Regional combined carcinogenic and non-carcinogenic hazard index based on heavy metal soil concentration was 5.5 for adults and 9.5 for children.

Conclusions:

Environmental characterization identified concentrations of heavy metals above ESSLs and greater than previously identified concentrations in similar studies performed within the Andes Mountains. Regional ASGM communities are at high risk due primarily to exposure to high concentrations of arsenic and mercury.

Introduction:

During artisanal and small-scale mining (ASGM), mercury (Hg) is used as an amalgamating agent to bind and extract gold from crushed ore. When gold is extracted from the amalgamation, mercury vapor and other heavy metals are dispersed into the environment. In the first stage of ASGM, aggregate material, rich with gold, is mined beneath the ground or along

plutonic outcroppings. The ore is then crushed in a tumbler loaded with steel/iron spheres and mixed with mercury, facilitating the first stage of amalgamation. Pulverized ore is then channeled with a mixture of water and surfactants through a sluice box or channel with mercury covered copper plates.[1] Next, gold rich silt is mechanically separated from waste tailings by use of a rocker box. The silt is collected and further refined by panning with mercury or spread on copper plates lined with mercury to extract sequestered gold. The amalgam is then dried and crudely burned. The burning is performed with blow torches or large pyres. Finally, gold is sold to smelters who then refine the gold and pour ingots.

Worker exposure to mercury and environmental contamination can occur along multiple steps in the process. Since the boiling point of mercury is lower than that of gold, mercury will volatilize leaving behind gold.[1] During this entire process mercury is often handled by workers without personal protective equipment such as chemical protective clothing and respirators. During the sluicing process, mercury may be accidently spilled on the round, wiped on clothing, or lost to the environment as mercury flour which readily contaminates soil and waterways near processing centers.[2,3] Chronic and acute mercury exposure results in a variety of adverse neurological effects such as tremors, loss of coordination, and neurodegenerative disease as well as renal failure and interstitial pneumonitis.[4,5] Children exposed to mercury can develop permanent neurological damage including developmental delays.[6]

ASGM sites are also commonly associated with other heavy metal contamination.[7] Exposure to elevated concentrations of heavy metals such as arsenic, mercury, cadmium, chromium, manganese and cobalt, as a consequence of mining, are linked to increased risk of developing adverse health effects and long lasting ecological damage.[8,9]In South America, ASGM is common in many low and middle income countries including Brazil, Venezuela, Colombia, Bolivia, French Guyana, Guyana, Ecuador, and Peru. This industry employees many unskilled workers and has the potential to expose many miners to large concentrations of mercury and other heavy metals.[10]

The primary goal of this study was to characterize regional environmental concentrations of mercury, arsenic, cobalt, and manganese in soils at and near ASGM processing centers and villages throughout La Cordillera Real of the Andes Mountains. Soil sampling for heavy metals was performed and compared to US Environmental Protection Agency (EPA) Ecological Soil

Screening Levels (ESSLs). Our secondary goal was to use soil values to characterize risk to populations residing in proximity to ASGM processing centers.

Methods:

Site Description:

The study region was located in La Cordillera Real range of the Andes Mountains in Bolivia located approximately 15 miles northeast of the city of Sorata. The elevation at the study sites was approximately 13,147 feet. Data was collected from processing centers located approximately less than 100 feet from the homes in the village.

Soil Sampling:

A total of 84 soil measurements were collected at two mine processing sites, Yani (n= 35) and Dorado (n= 23) (pseudonym), one village, Ingenio (n= 18), and concentrated molida (n=8). Soil measurements collected with an Innov-X (Massachusetts), x-ray fluorescence (XRF) Systems analyzer. Specific metals sampled were titanium (Ti), manganese (Mn), iron (Fe), cobalt (Co), zinc (Zn), arsenic (As), rubidium (Rb), strontium (Sr), zirconium (Zr), mercury (Hg) and lead (Pb). XRF analyzer was calibrated prior to and periodically during sample collection using a National Institute of Standards and Technology (NIST) calibration standard supplied by Innov-X for use with the XRF. Samples collected at the mine processing center were representative of day-to-day work tasks performed by workers including mining, loading, panning, sifting, trommel operation, equipment repair, and on site living quarters. Soil sampling in the surrounding village was performed within random areas where children were observed playing, such as the clinic, school yard, and adjacent open spaces.

Molida and ASGM Waste Stream

Molida is the amalgamated material that is extracted from the trommels and mercury lined sluice channels. This material is removed by hand or with simple hand tools. Molida is processed further by either panning or concentrating on a copper plate coated with mercury.

Molida is characteristic of ASGM tailings found directly beneath processing and sluicing equipment. Eight (8) molida samples were collected from the excess spill over material beneath a secondary trommel at the Yani processing center. Tailings of the gold extraction process were observed throughout the processing center along the ground adjacent troughs, sluice channels, shaker beds, and drainage culverts. Maximum soil concentrations were detected along these areas. To better represent the general regional characteristics of ASGM waste stream (n=11), maximum measured metal concentrations observed at each site were averaged in conjunction with molida concentrations to assess characteristics and assess environmental risks in comparison to US Environmental Protection Agency established ecological soil screening limits.

Risk Assessment:

A risk assessment was conducted in accordance with standard US Environmental Protection Agency (EPA) risk assessment guidance for noncancerous health endpoints. Risk characterization was performed on selected metals including arsenic, cobalt, manganese and mercury based on available reference values. Exposure routes included dermal, incidental ingestion, and inhalation pathways. According to the Exposure Factors Handbook, the average daily dose (ADD) for an element via ingestion, inhalation and dermal exposure pathways can be estimated using Equations (1), (2) and (3) respectively:[11,12]

Equation 1:

$$\text{ADD ingestion} = \frac{C*IngR*EF*ED}{BW*AT}$$

Equation 2:

$$\text{ADD inhalation} = \frac{C*t*InhR*EF*ED}{BW*AT}$$

Equation 3:

$$\text{ADD dermal} = \frac{C*SA*AF*ABS*EF*ED}{BW*AT}$$

Where:

C = Element concentration (mg/kg or mg/m^3)
IngR = Ingestion rate (mg/day)
IngR = Inhalation rate (m^3/day)
ABS = Dermal absorption factor
AF = Skin adherence factor (mg/cm^2per hour)
SA = Exposed body surface area (cm/hr)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight of exposed population (kg)
AT = Average time (days)
T = exposure time (hours/day)

Measurements below the limit of detection were replaced with$\left(\frac{LOD}{sqrt2}\right)$. Since the data was highly right skewed, geometric means were used to calculate risk estimates. Two age groups were considered for the analysis, children age 0 – 17 years and adult's age 18-38 years. Risk assessment assumed 24 hour per day exposure, 365 days a year and an estimated lifetime expectancy of 70 years. Exposure estimates for indigenous populations were used for our risk assessment: 400 mg/day incidental ingestion rate for all age groups and 30 m^3/day inhalation rate for adults, and 20m^3/day for children.[11,1311] Body weight inputs as defined in the USEPA's Exposure Factor Handbook were used for our calculations; 10kg for ages 0-2, 15 kg for ages 2–6, 30 kg for ages 6– 17, and 70 kg for adults. Exposures were averaged across age groups, no differentiation based on gender was performed.

Calculated ADD's, and non-cancerous hazard quotients (HQ) were calculated using Equations 4 and 5.[11]Reference doses (RfD) and reference concentrations (RfC) were obtained from the US EPA's Integrated Risk Information System (IRIS). If RfD's or RfC's were not established by the USEPA, recommended RfDs/RfCs were obtained from the California Environmental Protection Agency (CalEPA), or the EPA's National Center for Environmental Assessment (NCEA). If no RfD/RfC could be found, minimum risk levels (MRLs) published by the Agency for Toxic Substances Disease Registry (ATSDR) were used. Where published ingestion RfD's were available yet no dermal factors published, dermal reference dose was calculated by the product of the ingestion RfD and the gastrointestinal absorption factor (arsenic

Commented [Y1]: I read all the comments you had here regarding listing the values, because some of them differed across age groups, I thought it would be cleaner if had it in the paragraph below instead of writing a bunch of different numbers next to the defined terms.

Commented [BP2]: Same comment from before , what was the BW you used?

Commented [Y3R2]: Exactly how it's written. Calculations were performed for all blocks. The only variable that changed was the body weight per stratified age groups. Then the total exposure was averaged. Is that not a weighted average? I'm going to change the next comment on weighted vs averaged just in case.

100%, manganese 5%, cobalt 5%)[14-16] In the absence of reliable RfD/RfC or MRL, hazard quotients were not calculated. To communicate cumulative non-carcinogenic risks due to multiple routes of exposure, a total exposure Hazard Index (HI) was calculated using Equation 6.

Equation 4:

$$HQ = \frac{ADD}{RfD}$$

Equation 5:

$$HQ = \frac{ADD}{RfC}$$

Equation 6:

$$HI = \sum_1^i HQ$$

In addition to manual calculations for incidental ingestion rates and risk, the Risk Assessment Information System Preliminary Remediation Goals (RAIS) Calculator, developed by the Oak Ridge National Lab, was utilized to calculate non-carcinogenic inhalation risks based on volatilization factors (VF) and particulate emission factors (PEF) using default presets for both equations. Surface area for VF and PEF were corrected to 1 – 2 acres based on observed site conditions. Non-carcinogenic hazard quotients were added to provide a total hazard index across selected sites and selected metals. Regional HI's were calculated using raw sample collection data to ensure equal weighting for all collected samples.

USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) model was used to estimate blood lead levels (BLL) at all sites. Only soil concentrations were used to estimate pediatric BLL's. Analysis was stratified by one year increments from birth to the age of 6 years. For the purpose of simpler interpretation, estimated BLL's were aggregated into age segments, 0 – 2 and 2 – 6 years of age.

Results:

Dorado and Yani both exhibited large differences in range compared to Ingenio for arsenic, mercury, cobalt and lead. Soil descriptive statistics are shown in Table 1. Whereas

Commented [BP4]: Please read the EPA guidance that I provided in the email. This is not true if you are conducted EPA RA.

Commented [BP5]: Same as above

Commented [BP6]: Same comment from your last revision. Just listing values is not effective writing. Discuss the variability. Which site was highest. You have a three orders of magnitude difference in arsenic levels between sites. This is important.

Commented [YJD7R6]:

Ingenio exhibited a large range in manganese concentrations not observed elsewhere that may be due to the baseline geologic profile of the parent material in and around the village. Likely due to the lack of processing equipment in the village. Due to the large variance and range of metal concentrations throughout study sites, geometric means were calculated and used to assess site conditions. Ingenio and Dorado both shared similar arsenic (239 ppm and 318 ppm) and lead (30ppm and 32 ppm) concentrations, and varied significantly from Yani (arsenic 1,783 ppm and lead 100 ppm). Mercury concentrations at Dorado (56 ppm) and Yani (58 ppm) were both greater than that of concentrations measured at Ingenio Village (31 ppm), and while geometric mean arsenic concentrations between Ingenio (239 ppm) and Dorado (318 ppm) were proximally closer to each other in comparison to Yani (1,783 ppm), the maximum concentration and standard means of Dorado (Mean = 5,208 ppm, Max = 80,605 ppm) and Yani (Mean = 8,944 ppm, Max = 137,022 ppm) were both significantly greater than that of Ingenio Village (Mean = 801 ppm, Max = 5,093 ppm). These data do not take into consideration spatial relationships to metal concentrations and as they are geometric means and not an expression of concentrations in the upper standard deviations, these data are likely an underrepresentation of actual conditions.

Maximum soil metal concentrations measured along unprotected culverts and deltas of constructed concrete channels designed to divert excess water and waste spillage to determine the characteristics of the waste stream entering the environment. Maximum soil metal concentrations from Yani (n=1), Dorado (n=1), and Ingenio (n=1), in conjunction with tumbler waste (n=8) were used to calculate a regional waste characterization profile. Data was highly variable and geometric means were utilized for characterization. Geometric mean concentrations of arsenic, mercury and lead at 41,921 ppm, 254 ppm, and 492 ppm, respectively. These concentrations were all above applicable mammalian and plant ESSL's. With the exception of manganese (413 ppm) and mercury (53), all other selected metals were above mammalian ESSL's, however these two compounds were found to be above invertebrate ESSL's. Mercury and manganese concentrations at all study sites were above all applicable ESSL's. In addition, with the exception of lead, the geometric mean soil metal concentration of all tested metals were above plant ESSL's.

To determine if hazardous conditions beyond ESSL plant, invertebrate, and mammal limits were present throughout study sites, geometric mean soil metal concentrations from Yani, Ingenio, and Dorado were utilized to quantify exposure hazards in terms of the hazard quotients

for specific metals through inhalation, ingestion, and dermal routes of exposure and hazard indexes for the same. Calculated hazard quotients for dermal, ingestion and inhalation exposure are shown in Table 2. Hazard indexes derived from respective hazard quotients are shown in Table 3.

Commented [BP8]: Need a topic sentence

Hazard quotients from inhalation of volatilized mercury proved to be the largest contributor to total HI (30% in children and 93% in adults). Clusters of mercury contamination were detected in areas associated with direct use of mercury in ASGM. GIS interpolation (Figures 2 and 3) illustrates the distribution of mercury and arsenic soil concentrations at Yani processing center. Total hazard indices at Yani were three times as high as those observed at Ingenio village and approximately twice as great as observed at the Dorado facility. This was largely due to the significant concentration of arsenic present at Yani.

Commented [BP9]: Good paragraph!

In comparing total HI's of children to adults, children were more susceptible in all categories of exposure throughout the region. Child HI's ranged from 6.6 to 15.1 with a regional average of 9.5 in comparison to adults range of 3.7 to 7.4 and regional average of 5.5. These results are unsurprising given that children have higher ingestion rates and weight considerably less. Accounting for both a higher ingestion exposure rate and greater dose to weight ratio. Regional HI based on arsenic exposure was 2.6 out of 8.8 in children in comparison to 0.3 out of 5.5 in adults. Furthermore, site specific interpretation demonstrate that children within all tested sites have an HI greater than 1, the greatest of which was Yani at 15.1.

Estimated blood lead levels in children are shown in Table 5. Modeled blood lead levels were calculated for two age groups, infants (0 – 2) and children (2 – 6). Regional modeled BLL's for infants and children were 1.8 ug/dL and 1.5 ug/dL respectively. Infant BLL's ranged from 1.4 ug/dL at Dorado and 2.3 ug/dL at Yani. Child BLL's ranged from 1.1 ug/dL at Dorado and 1.8 ug/dL at Yani. These results indicate lead exposure is not a concern in the region as they were all below the World Health Organizations recommended 5 ug/dL limit.[17]

Discussion

The overall goal of this study was to characterize metal contamination at and near ASGM processing centers and villages located throughout the Cordillera Real (Real Mountain Range) of

the Andes Mountains. Soil sampling for heavy metals was performed and compared to US Environmental Protection Agency (EPA) Ecological Soil Screening Levels (ESSLs). The secondary goal of the project was to characterize risk to populations residing in close proximity to ASGM processing centers using soil data.

ASGM communities do not employ best practice methods and generally there are no catchment basins, settling tanks, or primary filtration methods employed. The lack of these control methods can lead to the release of mercury flour, which is fine sediment embedded with small (<1mm) mercury particles into the environment.[1,18] This mercury flour can migrate into the sediment of waterways and damage the aquatic environment. In addition, mercury vapor can be released into the environment and contaminate soil and crops.[2,19,20] In a similar study of two ASGM facilities located within the Bolivian Andes Mountains, surface soil concentrations were analyzed and their results yielded mean soil concentrations of 14.5 ppm mercury near incineration areas and 0.17 ppm mercury at control sites.[21] In comparison to our study, where maximum concentrations of mercury were as high as 184 ppm at the incineration site and 29,483 ppm near the drainage canals and regional geometric mean for mercury was 53 ppm, 3 times greater than the similar study performed in the Bolivian Andes Mountains. [21] Furthermore, characterization of soil metal concentrations throughout all study sites also demonstrated geometric mean metal concentrations above one or more ESSL's. Our findings demonstrated considerable higher environmental contamination of regional environmental concentrations of heavy metals elevated in comparison to nearly all established ecological soil screening levels (Figure 1).

Elevated heavy metal concentrations of this magnitude induce stress in fish, amphibians, birds, and small mammals.[22] Based on the results of our waste characterization, it can be assumed that the majority of waterways in the vicinity of our study locations are void of life and at best provide sub-optimal conditions for ecological stability. Especially concerning was the high arsenic concentrations representing regional waste streams, which at 41,921 ppm is nearly 10,000 times higher than the mammalian ESSL of 46 ppm. Mean mercury concentrations were approximately 850 times that of the acceptable plant ESSL. Furthermore, elemental and inorganic mercury that enters local waterways is transformed by microorganisms into methylmercury, which then contaminate fish and other aquatic wildlife that may be consumed by

Commented [BP10]: If this is your goal, you need to have a paragraph in the results

Commented [BP11]: ppm of what? This does not seem high>

Commented [BP12]: These values need to be compared to ESSL since this was a goal of your study

Commented [BP13]: By the water or in the fish?

Commented [Y14R13]: In regards to the overall scope of this capstone paper, does it really matter? It's a finding from other studies showing inorganic mercury contamination leads to organic transformation and ultimate ingestion by the population.

local populations downstream of mining sites and processing centers.[23-25] Although this poses a serious health concern, this route was not considered in our study due to the complex nature of metabolic transformation of methylmercury and its subsequent transportation and bioaccumulation throughout the food chain.[5,19,26] Little to no protective measures were employed in the design of the processing sites. In the case of the Dorado site, contaminated water from the sluices, trommels, panning, and cleaning operations were readily observed flowing directly into the village. Based on our risk assessment, soil metal concentrations within the village and processing center were sufficient to pose a hazard to children and adults. The HI of populations living in the region demonstrate significant risk of developing adverse health effects from exposure to all measured environmental contaminants. Our data was collected primarily throughout common areas and processing centers. Average HI for adults was 5.5 at the three different sites, with a minimum total risk of 3.7 attributable to Ingenio Village and maximum total risk of 7.4 attributable to the Yani processing center. Of the various exposure pathways and metals, hazard quotients for mercury inhalation proved to be the largest contributor to total HI. Within the village of Ingenio, calculated HI's of children and adults exposed to mercury was 3.5. Previous studies have demonstrated indoor metallic contamination is associated with inadequate doffing of work clothes which leads to increased transport of contaminants into the home.[3,22] Previous studies have shown children exposed to inorganic mercury are at risk of developing adenopathy, gingival discoloration and dermatological abnormalities.[27,28]

In our study regional mercury HI for children were 5.1, confirming the high risk scenario posed by exposure to mercury due to ASGM. In addition, children exposed to inorganic mercury grow with developmental deficiencies due to cognitive dysfunction and mercury's destruction of neural communication pathways.[6] Furthermore, a study performed in Mali, found that children as young as 6 years old were seen digging mine shafts, carrying and crushing stone, and panning for gold alongside adults.[29] The study also found that between 20,000–40,000 children from that country work in gold mining, and that many among them carry out amalgamation, which can result in protracted exposure to mercury vapor.[18] Previous studies have demonstrated ASGM health effects are not limited exclusively to mercury contamination; arsenic, cadmium, chromium, and other heavy metals also contribute to disease burden. [6,18] In our study large concentrations of arsenic were detected throughout the study region. Arsenic has been previously documented, contaminated waste inevitably makes its way from the workplace to the

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Commented [BP16]: Not sure what this means

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surrounding environment during artisanal extraction of gold. [8] Urinary arsenic concentrations have been demonstrated to correlate with arsenic concentrations in soil demonstrating a completed exposure pathway.[24,25] Arsenic concentrations ranging from 99 ppm to 9136 ppm are associated with a high rate of dermatological symptoms consistent with arsenicosis.[30]In comparison, our measured arsenic concentrations ranged from 9 ppm to 137,022 ppm and regional child hazard indices as a consequence of soil arsenic concentrations were measured at 2.6, with the highest index of 7.7 attributable to Yani. Like mercury, heavy metals such as arsenic are easily transported into the ecological distribution chain and make their way into the water supply and food consumption pathways.[31]

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Limitations and Further Research

While our study focused on the environmental characterization of multiple sites throughout the Bolivian Andes, our study was limited to soil concentrations. The elevated presence of these contaminants necessitates the need for further comprehensive characterization of all contamination pathways including food and water. High inorganic mercury directly correlates to organic mercury concentrations.[9,32] Environmental impacts of these high mercury concentrations are observable in the soil, water and also in the flora and fauna as organic methylmercury.[20] The presence of mercury in water is a persistent concern when examining the impacts of ASGM. High quantities of dissolved mercury are commonly found in water samples collected near ASGM runoff basins. One such study conducted in the Philippines determined that concentrations of mercury were up to two orders of magnitude above natural background levels, and at concentrations far above World Health Organization (WHO) guidelines.[20]

On the extent of pulverization and amalgamation, tailings vary in size. It is not uncharacteristic for tailings to be comprised of particles ranging from <50um to 500um.[23]A particle profile was not performed as part of our characterization and requires further study to better ascertain the degree of silt deposits within the waterways. As noted previously, the presence of elevated heavy metals also requires further research. The interrelated effects of exposure to multiple metals across multiple exposure pathways must be fully assessed and correlated to actual human derived data in order to comprehensively characterize exposure, dose, and health risks within ASGM communities in the Bolivian Andes.

List of Tables and Figures:

Table 1:
Site specific soil statistics in mg/kg. All study sites (n=84)

		As	Co	Mn	Hg	Pb
Ingenio Village (n=18)	Mean	801	1166	6269	74	41
	Median	167	427	326	18	31
	Min	36	241	154	14	12
	Max	5093	6848	57326	658	142
	Std. D	1514	2034	17367	153	39
	Geomean	239	583	534	31	30
		As	Co	Mn	Hg	Pb
Yani Mine Processing Center (n=35)	Mean	8944	811	495	126	171
	Median	1429	395	397	34	94
	Min	77	252	174	14	20
	Max	137022	9279	3089	737	789
	Std. D	24371	1534	487	179	183
	GeoMean	1783	518	411	58	100
		As	Co	Mn	Hg	Pb
Dorado Mine Processing Center (n=23)	Mean	5208	433	673	1430	62
	Median	402	245	370	23	28
	Min	9	42	71	10	8
	Max	80605	3422	6316	29483	575
	Std. D	16961	679	1272	6125	119
	GeoMean	318	263	361	56	32
		As	Co	Mn	Hg	Pb
Waste Characteristics (n=11)	Mean	54976	4838	6360	2892	563
	Median	44267	4252	584	150	575
	Min	5093	2662	181	73	142
	Max	137022	9279	57326	29483	959
	Std. D	37360	1873	17007	8823	273
	GeoMean	41921	4565	882	254	492
		As	Co	Mn	Hg	Pb
Regional Average (n=84)	Mean	9982	1107	1772	471	153
	Median	748	385	377	29	44
	Min	9	42	71	10	8
	Max	137022	9279	57326	29483	959
	Std. D	22927	1750	8191	3192	216
	Geomean	997	537	413	53	66

Commented [BP20]: Same comments as before. No units.

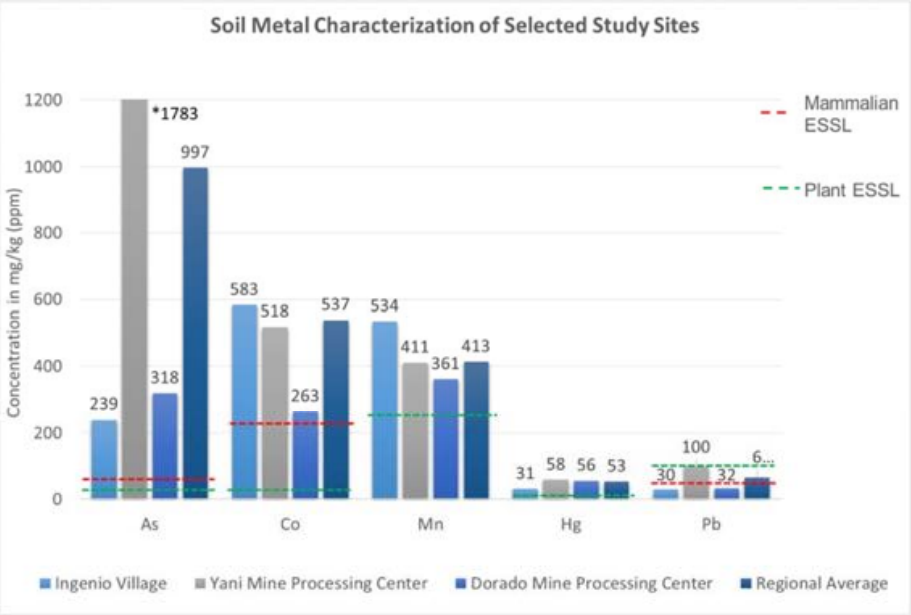
Commented [BP21]: If you add up all the number you get 87. Regional average is 86. How many were collected

Commented [Y22R21]: Stop adding them.

Ingenio = 18
Yani = 35
Dorado = 23
Waste = 1 (Max) from Ingenio, 1 (Max) from Yani, 1 (Max) from Dorado and 8 from trommel waste. [It's explained in the methods]
Regional = Ingenio + Yani + Dorado

Figure 1:

Soil metal characterizations of studied sites and regional average as compared to ecological soil screening limits.



Geometric mean environmental concentrations as compared to established ecological soil screening levels in mg/kg (ppm)

Analyte	Invertebrate SSL	Mammalian SSL	Plant SSL	Ingenio	Yani	Dorado	Regional Characteristics	Waste Stream*
As	na	46	18	239	1783	318	997	41921
Co	na	230	13	583	518	263	537	4565
Mn	450	4000	220	534	411	361	413	882
Hg	0.1	na	0.3	31	58	56	53	254
Pb	1700	56	120	30	100	32	66	492

* not shown in graph above

Table 2:

Hazard Quotients (HQ's) of metals and metalloids throughout surveyed locations based on soil metal concentrations, volatilization and particulate emission factors.

Location	Metal	Hazard Quotient					
		Ingestion		Dermal		Inhalation	
		Child	Adult	Child	Adult	Child	Adult
Ingenio Village	As	0.35	0.00	0.76	0.13	0.01	0.01
	Co	1.07	0.00	0.78	0.00	0.09	0.09
	Mn	0.01	0.00	0.01	0.00	0.01	0.01
	Hg	0.00	0.00	0.00	0.00	3.47	3.47
Yani Mine	As	1.97	0.01	5.64	0.94	0.10	0.10
	Co	0.97	0.00	0.01	0.01	0.07	0.07
	Mn	0.01	0.00	0.01	0.00	0.01	0.01
	Hg	0.00	0.00	0.00	0.00	6.31	6.31
Dorado Mine	As	0.44	0.00	1.01	0.17	0.02	0.02
	Co	0.57	0.00	0.35	0.00	0.04	0.04
	Mn	0.01	0.00	0.01	0.00	0.01	0.01
	Hg	0.00	0.00	0.00	0.00	6.86	6.86
Regional Characteristics	As	1.15	0.00	1.34	0.26	0.07	0.07
	Co	1.00	0.00	0.72	0.01	0.10	0.10
	Mn	0.01	0.00	0.01	0.00	0.01	0.01
	Hg	0.00	0.00	0.00	0.00	5.09	5.09

Commented [BP23]: This is too messy and cannot be read. You should delete the ADD- there is not much there and just present the HQ and HI. Why is there no HQ for some metals for ingestion and dermal routes? If you cannot calculate these, this needs to be stated.

Commented [Y24R23]: It's the second sentence of the table.

Table 3

Elemental hazard indices as derived from geometric mean soil metal concentrations throughout study sites

Location	Metal	Hazard Index	
		Child	Adult
Ingenio Village	As	1.1	0.1
	Co	1.9	0.1
	Mn	0.0	0.0
	Hg	3.5	3.5
	Total HI	6.6	3.7
Yani Processing Center	As	7.7	1.0
	Co	1.0	0.1
	Mn	0.0	0.0
	Hg	6.3	6.3
	Total HI	15.1	7.4
Dorado Mine	As	1.5	0.2
	Co	1.0	0.0
	Mn	0.0	0.0
	Hg	6.9	6.9
	Total HI	9.3	7.1
Regional	As	2.6	0.3
	Co	1.8	0.1
	Mn	0.0	0.0
	Hg	5.1	5.1
	Total HI	9.5	5.5

Table 4

Estimated blood lead level in ug/dL via Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK)

Location	Age Range	BLL
Ingenio Village	0 - 2	1.7
	2 - 7	1.4
Yani	0 - 2	2.3
	2 - 7	1.8
Dorado	0 - 2	1.4
	2 - 7	1.1
Regional	0 - 2	1.8
	2 - 7	1.5

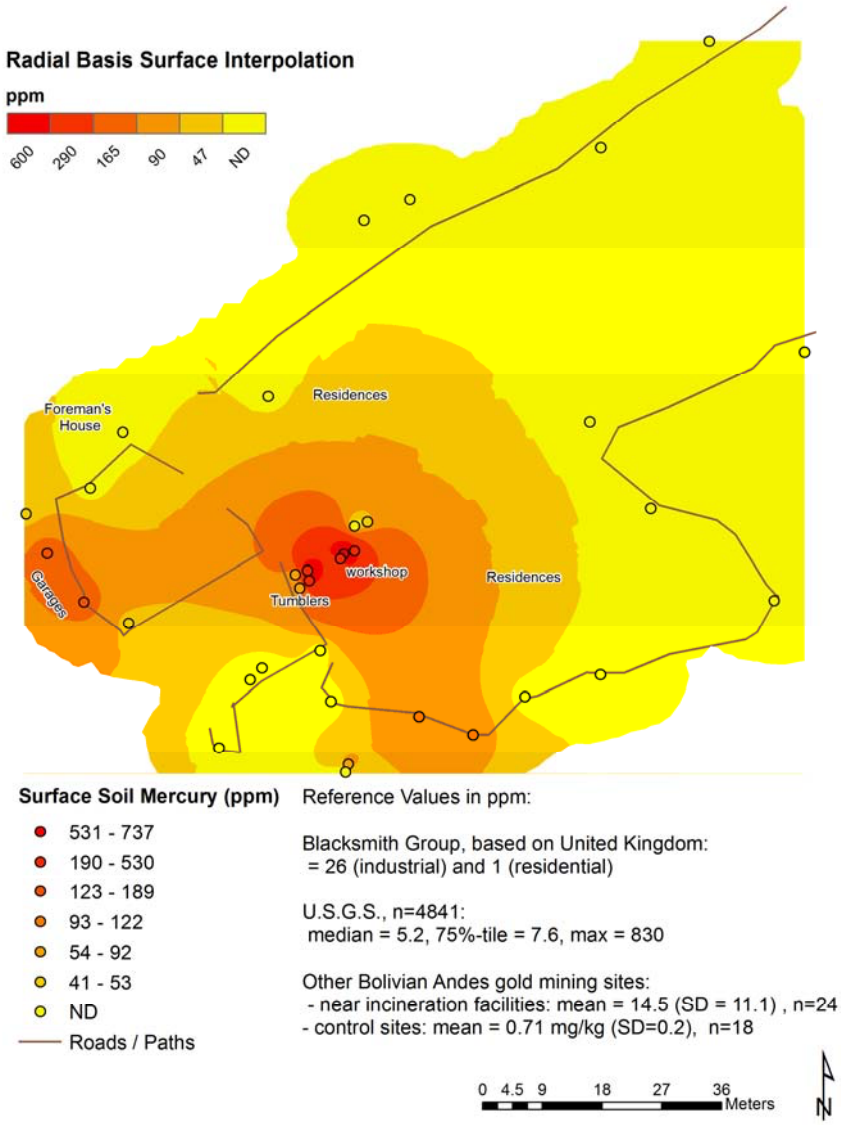


Figure 2: Surface soil mercury levels at mine site 1 (Yani Mine), overlaying an interpolated virtual surface of mercury concentrations based on the radial basis algorithm. Reference values provided to assist interpretation. (Dr. Glen Johnson)

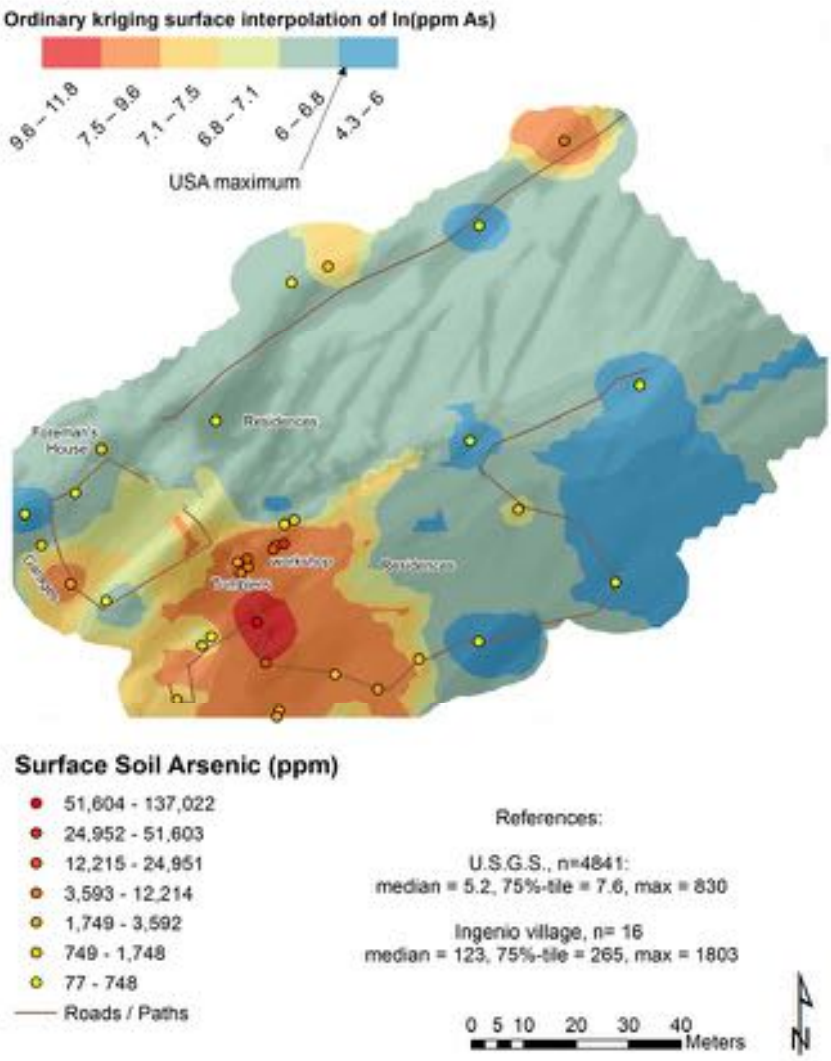


Figure 3: Surface soil arsenic levels at mine 1 (Yani mine). Prediction surface in natural log units, overlaid with sample locations showing original measurements in mg/kg (ppm). (Dr. Glen Johnson)

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Simulated Diabetes Assessment: A Distance Learning Tool for Dietetics Students

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Abstract

Objectives: The aim of this project was to create a distance learning tool for dietetics students that simulated how to perform a nutritional assessment of a recently diagnosed diabetes patient and incorporate that information into an electronic medical record (EMR).

Methods: A literature review revealed an absence of simulation education in dietetics. Development of a diabetes patient persona and corresponding nutritional assessment was executed on selected GoAnimate software and synced with an EMR portal.

Results: A four minute animated tutorial was constructed using contemporary tone, design, and storytelling style to simulate the dialogue between a diabetes patient and his dietitian. The simulation links to an EMR portal where students can enter their observations and compare them to an existing EMR sample.

Conclusions: Simulations provide experiential learning opportunities for dietetics students unable to secure on-site clinical placement. They are easily tailored to different patient and disease scenarios, allowing for variety and affordability, and with EMR integration introduce students to patient portals. Further testing and feedback is required to determine the efficacy of our simulation for dietetics students.

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Introduction

Simulated Education in Health Care

The use of educational simulations in health care has been evident throughout the past couple of decades. But it is only recently, within the last five years, that the field of health care has begun to truly tap into the potential that patient simulations can deliver. Simulations provide an immersive alternative to on site learning that may not be accessible to students or professionals. Following in the footsteps of many other leading industries like aviation, health care has joined the ranks in investing in the creation and implementation of simulations that allow participants to learn and hone their abilities when it comes to patient understanding, diagnosis and treatment, safety, quality, and efficiency. [1]

While simulations may be the new horizon, they above all are only a technique, not a replacement for more traditional health care education and practice. They further provide supplemental experience to often substandard clinical internships, apprenticeships, and general training opportunities. Health simulations have been known to promote education, provide rehearsal opportunities, foster teamwork, speak to a variety of different health care situations, encourage communication, and ground the conceptual into the practical. Some believe that measurability and cost of simulations are still points of consideration in their success. Others, however, stand firm that this is just the beginning of major progress in a new and trailblazing approach to health care.[1]

The driving force behind the implementation of health care simulations is to provide students and continuing education professionals with the opportunity to develop clinical reasoning and problem solving skills.[1,2] Traditional academic education does provide first-rate learning opportunities, but simulations aim to fill the void of experiential, real-life learning often left behind or unavailable. Providing a hands-on approach to learning through simulations lends students the opportunity to address diverse patients and cases as they themselves would in the real world, all the while minimizing risk and reinforcing the fact that not all scenarios are black and white.[1,2] One study found that students who participated in a life threatening simulation performed better in emergency assessment and management.[3] Another study reported positive changes in self perceived ability and satisfaction among students who engaged with an educational simulation.[4]

The health care profession has defined simulation as a way of recreating real life experiences with guided aid to elicit aspects of the corresponding actual reality.[5] However, there is still slight dispute as to whether simulations must incorporate an actual technology or rely only on actor or mannequin based exercises.[6] Yet, successful simulations, no matter how they are executed, must provide a researched, compelling, and applicable narrative to provide participants with an ideal experience from which to learn.[6,7] In the realm of technology based simulations, such aspects of storytelling often play on and borrow from video gaming. Role playing, skill level, aesthetics,

virtual environments, back stories, and representational conventions all contextualize the simulation and ground it for easy digestion by students. Similar to video games, there is also an importance of immersion in health simulations. Enveloping message intent in fiction and imagination or dramatization and exaggeration allows students to connect with the story and learn at their own pace.[7]

Nursing as a Model

While the landscape of simulation based education in healthcare is still quite limited though simultaneously accelerating, the field of nursing has been somewhat of a pioneer in this movement toward such progressive and alternative pedagogy.[8] The infancy of their methods, however, has identified a remaining lack of evaluated infrastructure among simulated education techniques.[8] Furthermore, efforts to measure the extent of student competence post simulation interaction are still a matter of contention. Simulated education in the health sector is an unsaturated area, leaving no real clinical benchmarks as a guide for evaluation.[8,9] But, in one study, nursing students reported having an overall better grasp of their clinical responsibilities and better communication techniques following their interaction with a simulated experience.[9]

A Simulation Void in Dietetics

Compared to the field of nursing, the field of dietetics remains stagnant in its efforts to keep relevant and evolve its educational practices.[10] Incorporating simulated educational experiences into dietetics teaching appears favorable when assessing its impact in nursing, but a sizeable shortage exists in dietetics simulation research to prove its effectiveness.[10] Additionally, lack of training among dietetics educators to implement simulations and cost cutting administrations prove problematic for trial success.[11] However, dietetics organizations like The Academy of Nutrition and Dietetics, The Academy of Nutrition and Dietetics Foundation, and The Accreditation Council for Education in Nutrition and Dietetics have recently encouraged the pursuit of simulation creation, recognizing their potential in utility, variety, and skill acquisition and maintenance, especially in supplemental didactic education for students and interns.[11,12]

Diabetes Standardization

Connecting dietetic students with clinical experiences is crucial in honing their craft and their eventual ability to assess and treat specific diseases. If clinical opportunities for students to adequately learn their trade are limited, it is ultimately the patients who suffer. The need for educated dieticians is crucial, especially now with obesity at an all-time high in the United States resulting in case after case of diabetes diagnoses.[13] And while simulated education is absent among dietetic studies, one study among resident physicians who engaged with a simulated educational activity showcasing a standardized patient with diabetes resulted in their elevated cognitive skills of diabetes management in addition to their self-reported improved knowledge and confidence in their abilities.[14] Patient and disease standardization, in another study among dietetic students, was noted for its ability to provide objective and immediate evaluation and more thorough education and patient connection.[15,16]

EMR Literacy and Integration

As health fields attempt forward leaps in their educational applications, there must also be awareness and incorporation of other industry advances currently in execution, specifically EMRs, to anticipate and ensure eventual and ultimate reciprocity among health care undertakings. Regarding diabetes care in the United States, EMRs have not only been used to track patient health in general but have also aided in pattern recognition in diabetes risk forecasting as well as provided data to better assess diabetes quality of care.[17,18,19] EMR literacy and utility must be a consideration point when constructing future simulations, lending to the possibility of a simulation and EMR integration to expedite and recognize best practices in patient care. Similar to educational simulations, the use of EMRs is also a newer practice in the field of health. Marrying these novel tools will allow for more cost effective and seamless educational protocol for students regarding health technology comprehension as well as lay the foundation for more transparent communication and more well-rounded navigation surrounding patient care.[20]

Methods

Literature Review

The first step in designing an interactive, educational simulation was to research the current health communications landscape to understand what other systems have been implemented and successfully adopted. While educational simulation is somewhat of a new pursuit in the health sector, the field of nursing specifically has been a forerunner in several iterations of such technologies. However, upon further investigation, simulations currently in practice have lent themselves to educating on procedure and protocol through the use of mannequin simulations or question-based computer tutorials that rely on students watching and listening to monotonous talking heads of medical professionals. With the embrace of modern technology and innovative learning methodologies in the classroom and in distance learning worldwide, there is still a void in contemporary, immersive simulated health education. And while the nursing profession has been open and welcoming to new educational methodologies, the field of dietetics remains static.

Software Platform Selection

Identifying this absence of simulated teaching practices allowed the research team to start from scratch in terms of brainstorming how to deliver the immersive simulated experience. After engaging with multiple simulation platforms, the team selected GoAnimate, an animation software that consists of a user friendly interface, resulting in animation that is relatable to an audience based on its wide use among American universities and feedback from past users. The program removes antiquated coding and animation processes and allows the designer to easily create an animated environment simply by dragging and dropping design elements. The ability to tailor characters and dialogue was also a consideration when choosing a system as it was crucial the simulation reflect gender, racial, and ethnic diversity in addition to providing variety in location and background setting options. Turning away from more traditional simulations,

GoAnimate also allowed for the incorporation of special effects and music to reinforce the truly immersive, multimedia experience needed for dietetics students eventually using the simulation; an experience that focuses on *showing* students how to navigate a dietetic consult rather than *telling* them how. This software was also a very economical choice that suited our specific needs and more importantly provided a system that was easily repeatable if other professionals were to potentially pursue similar simulations in the future.

Story and Patient Development

Next phases focused on story development including demographics of patient, specifics of disease, and treatment options. In efforts to minimize bias, both patient profile and disease diagnosis were randomly selected and a nutritional assessment conducted accordingly. Behavioral characteristics, professional career, family life and history, and lifestyle choices and habits were also considered to create a holistic and realistic persona. The protagonist, known as Stan, is white, male, middle-aged, overweight/obese, and recently diagnosed with Type 2 Diabetes. He was once a healthy athlete circa his college years, but his body mass index (BMI) now borders 30, suggesting that he is overweight/obese. He is also divorced with two children, works a typical stationary desk job, eats an overall unhealthy diet, does not exercise, takes Colace and Pepto Bismol to alleviate heartburn and constipation, uses sleeping pills and St. John's Wort for depression, and has a family history of high blood pressure, high cholesterol, heart disease, gallstones, and arthritis.

Most significantly, Stan's Type 2 Diabetes diagnosis is a surprise to him, which is understandable, as most of the general population is blind to their own diagnosis. He finds himself in the hospital for a broken femur which in turn leads to his doctors running other tests and uncovering his Type 2 Diabetes, thus referring him for a dietetic consult. This story background helps to further portray an accurate representation of patients whom dietetics students encounter in real-life clinical environments. Once the basic character details are outlined and noted by students participating in the simulation, the virtual dietitian can further assess the patient and provide care. By interviewing the patient, the dietitian can probe for other important data while students observe the dialogue between the two and learn the appropriate way to interact with a patient and how best to move forward with dietary advice in the situation.

EMR Incorporation

The GoAnimate software also allowed for the ability to link out from the simulation to a standardized EMR interface. This is a supplemental element of the simulation to promote EMR utility and literacy in which students will ultimately enter data they have noted while engaging with the simulation and observing the conversation between the patient and the dietitian. Students will also be able to compare their notes against a pre-existing, completed EMR to check for accuracy and attention to detail. This EMR capability required hosting on a secure backend server. It was also essential to make certain the final pre-existing EMR would reflect any

changes in the storyline that came about from edit discussions among the team, i.e. medication or diet changes, during simulation construction.

Simulation and EMR Construction

Accounting for all the character and storyline details, a working script was greenlit and construction on the simulation and data entry into the sample EMR began. The GoAnimate software provided a password protected space in which only team members could view project progress. Constant editing suggestions and feedback were given by team members to ensure proper balance between educational and interactive aspects of the simulation. Multiple revisions were made, music was incorporated, and the EMR was synced to the end of the simulation. The ending was also further focused to concentrate more on how to handle next steps in day to day life once the patient departs the hospital.

Results

Simulation Tone

While the team set out to construct a fully immersive simulation in which dietetics students can actively partake in the consultation between a newly diagnosed Type 2 Diabetes patient and a Registered Dietitian, the final simulation is much more observational than participatory. However, utilizing the colorful style and creative animation capabilities of the GoAnimate software, the simulation does deliver a more playful tone when compared to more traditional tutorials. And while the severity of a diabetes diagnosis is significant, the lighter tone of the simulation provides a more digestible understanding of the actual scenario. In reality, the majority of a nutritional assessment occurs in a clinical setting; however this simulation takes the viewer out of that environment and shows them first-hand vignettes of what Stan is referring to when he discusses his personal and professional life, diet, and medical and family history (see figures 1-4). Utilizing this story telling technique aims to keep viewers more engaged with the narrative and therefore more likely to note the vital information they are looking for to assess Stan's health. It also provides a sense of relatability to the patient.

Simulation Design

Design elements like detailed backgrounds and character props, character traits like accents and diverse skin color, and filming techniques like zooming and fading also work to better appeal to present day students and specifically target their visual and auditory senses to maintain their undivided interest for the full four minutes in which the simulation runs. Similarly, more experimental imagery and out of the box special effects and sound choices produce a more creative and more exciting viewing experience, one that maximizes our main goal of showing students how to navigate a dietetic consult verses just telling them how to do it (see figures 1-4).

Narrative Technique

The simulation provides fluidity between characters and a virtual aesthetic that helps to destigmatize an all too familiar health scenario of disease diagnosis. There is a sense of team

work and health promotion manifested in the simulation that is essential for any dietitian to translate to a patient. While the simulation guides dietetic students through the vernacular of a nutritional assessment it also shows them appropriate and sympathetic bedside manner and the importance of reinforcing to patients that they must take what they learn with them once they leave the hospital and apply it to their daily lives.

EMR Interaction

The simulation ends with a link to the EMR portal that is in harsh contrast to the simulation itself, looking more like a database that requires a user login and password for users. Upon entrance into the interface, users can enter in the notes they took while watching the simulation and conclude their overall assessment of the patient (see tables 1-2).

Discussion

Responding to a Need

The landscape of interactive, fully immersive multimedia health tutorials is limited. While research reveals sporadic use of more traditional simulations in the nursing profession, the field of dietetics remains stagnant. Creating a modern nutritional assessment simulation for dietetics students who are unable to secure clinical training is a much needed endeavor, especially when clinical placements for dietetics students are few and highly competitive. A simulation such as this one is a trailblazing concept in the dietetic community. Not only will it allow students the ability to learn remotely but it will also help to propel the field of dietetics into today's tech savvy world.

Limitations

Since the idea of a nutritional simulation is novel, the research team encountered several limitations throughout the execution process. The team had originally hoped to create a more immersive experience for dietetics students in which they could physically participate in the simulation by selecting different scenarios and outcomes themselves, guiding the story on their own and tailoring their experience to their own interests. The simulation software marketplace is lacking on such affordable technology for academia at present and therefore the simulation software that we ultimately chose did not allow for such an extensive interactive and in-real-time capability.

Also, the heavy cartoon stylization of the simulation is specific to the GoAnimate software. It does raise awareness as to how this simulation will be received by students using it and others observing it and whether they find it engaging or distracting. Additionally, the EMR integration occurs at the end of the simulation which could pose problematic for students looking to simultaneously enter in data while engaging with the simulation.

Recommendations

The simulation and EMR have yet to be focus group and pilot tested among students pursing dietetic careers. With more time, the research team expects to gain feedback on user experience and navigation, aesthetic appearance, level of utility, and extent of applicability and educational impact.

The team will recruit university students to engage with the simulation. Prior to initial simulation use, these students will be surveyed on their perspectives on distance learning tools and simulation tutorials, their confidence in learning new software, and their personal experience with patient portals and EMRs. After they have engaged with the simulation and EMR, they will be surveyed again on the same topics as well as additional questioning on their personal experience with our simulation and if they have any suggested alterations or feedback.

Conclusions

As other health fields look to incorporate simulated teaching methods into their educational practices, dietetics has yet to join the ranks. Guided by the strides made in the field of nursing specifically, simulated nutritional assessment tools will fill a void in viable observational learning options for dietetics students who are unable to secure in-person clinical placement to further their education. EMR integration into simulated education tools will also provide a foundational familiarity and navigational literacy of patient portals for students. Simulations also offer educational experiences that can be easily tailored to specific patient personas and diseases leading to an easily repeatable and cost effective alternative to on site clinical experience. With more focus group and pilot testing, the incorporation of dietetic simulations into didactic programs will result in standardized evaluation benchmarks with hopes of creating a rubric for successful distance learning simulations in nutrition education.

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Tables

Table 1. Sample EMR: Patient Demographics



Table 2. Sample EMR: Patient Assessment



Figures

Figure 1. Simulated Nutritional Assessment



Figure 2. Simulated Patient Diet



Figure 3. Simulated Patient Lifestyle



Figure 4. Simulated Diabetes Reach



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*c. Identification of relevant **gaps in knowledge***	x					
*d. Clear **rationale** for the project*	x					
e. Summary of what will be covered in the paper (aims)	x					
f. Clear description of research conducted or project undertaken (and student's role in the process)						
4. Described the **Methods or Processes** including:	x					
a. Population, setting, sites and sample (if relevant)	x					
b. Description of information/data collection procedures and measures (qualitative or quantitative)or Process used to develop project	x					
c. Relevant data manipulation & analytic techniques used					x	
5. Presented **Results or Project Outcomes**, incl:	x					
a. Description of sample characteristics, or description of process outcomes	x					
b. Descriptive information on relevant risk factors and outcomes , or on curriculum, intervention or policy components that were assessed, adopted or tested	x					
c. Subgroup analysis, as appropriate					x	
d. Clearly labeled graphs and figures	x					

	C	S	P	N	N/A	Comments
e. Correctly used & interpreted measures and/or statistical tests					x	

C = Completely S = Substantially P = Partially N = Not at all N/A = Not applicable

	C	S	P	N	N/A	Comments
6. Synthesized findings in a **Discussion Section**, including:	x					
a. Succinct synthesis of results	x					
b. Interpretation of results in context of literature	x					
c. Summary of strengths and limitations of project	x					
d. Recommendations based on study or project findings and a conclusion/take home message	x					
7. Organized paper logically and in accordance with instructions, including:	x					
a. Correct length (3000-5000 words) and format (subheadings, margins, spacing)	x					
b. At least a minimum of 15 references, including ≥6 peer-reviewed sources	x					
c. Complete references, using AJPH format	x					
d. Proper attribution for all facts	x					
e. Correct spelling and grammar	x					
8. Organized paper in a clear and effective **style,** including:	x					
a. Ideas within & between paragraphs laid out in a clear & logical fashion	x					
b. Clear paper flow; readable	x					
c. Appropriate language for scientific writing	x					

Action to be taken, please check one:

x _____ This paper is acceptable with no revisions.

_____ This paper should be acceptable once the author makes the indicated revisions.

_____ This paper should be acceptable once the author makes the major revisions indicated.

_____ This paper is unacceptable.

Please comment on your reason for selecting the above choice: Report appears complete – evaluation of effectiveness does not appear to be there – but if this is just development of a model – perhaps it is not needed.

Development of an electronic medical record breast milk feeding exclusivity tracking tool for an outpatient, primary care pediatrics practice.

Advisor: Dr. Arlene Spark
Submitted: November 13, 2015
Abstract Word Count: 170
Text Word Count: 2780

Abstract

Objectives: To develop an electronic medical record (EMR) breast milk feeding (BMF) exclusivity tracking tool for use in an outpatient pediatrics practice.

Methods: A literature review determined that there was no standardized method of categorizing BMF exclusivity in the outpatient setting. Synthesizing three frequently cited definitions allowed us to create a standard set of definitions. Collaboration with the medical team and evaluating the current EMR documentation allowed us to utilize these definitions to create a BMF exclusivity tracking tool.

Results: A standardized set of definitions to categorize BMF exclusivity was developed and utilized to create the tracking tool. We also created an education schematic to train physicians to properly utilize the tracking tool and developed standardized language for EMR documentation of infant diet.

Conclusions: This comprehensive BMF exclusivity rate tracking tool, created from standardized definitions, is to be implemented into an outpatient, primary care pediatrics practice. The next step is to pilot, evaluate and revise the tool. This tool can provide practitioners with precise data for research and targeted interventions to promote exclusive BMF.

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Introduction

Throughout this paper the use of the term "breast milk feeding," abbreviated BMF, instead of "breastfeeding" is deliberate to be inclusive of breast milk provided through all modes including breast, bottle, cup, and other supplemental devices.

Benefits

Breast milk provides infants the ideal nutrition and provides immune factors, passed from mother to infant, that improve their immune system.[1,2] This benefit lasts well into adulthood. Health benefits of BMF include a reduction in childhood conditions such as upper respiratory infections and ear infections, and conditions later in life such as the occurrence of obesity and type 2 diabetes.[1,2] Health benefits are not exclusive to the infant, mothers who provide breast milk to their infant also benefit from a reduction in risk of ovarian, breast, and uterine cancer, positively correlated with the duration of providing breast milk.[1,2] Other maternal health benefits may include returning to pregnancy weight sooner and promoting uterine involution.[1,2]

It is well-established that breast milk is the preferred food for providing the infant's sole nutrition from birth to six months.[1] After six months it is recommended by the Academy of Pediatrics (AAP) to continue providing breast milk for at least the first year, along with complementary foods, and continued as long as desired for by mother and infant.[1] The World Health Organization (WHO) recommends providing breast milk for at least the first two years of life.[2]

Health improvements due to BMF contribute a substantial cost savings in the health care system. If 90% of women BMF exclusively for six months and, along with complementary foods, for the first year, there would be a $13 billion reduction in direct pediatric health care costs in the United States.[1]

Barriers

Despite economic and health benefits there are many reasons why women may not initiate BMF or prematurely discontinue BMF. Barriers to BMF include lack of education, misinformation about BMF, lack of social support, medical contraindications to BMF, or personal choice.[3,4] Low income, minority women are at higher risk of early BMF cessation compared to women of other socioeconomic and ethnic groups.[3,4] Understanding the reasons for BMF cessation in an outpatient, primary care pediatrics setting can help practitioners target interventions to promote BMF exclusivity in alignment with the AAP and WHO guidelines.[3]

Definitions

Over the past three decades, three different definitions for BMF exclusivity have been proposed. In 1990 the Interagency Group for Action on Breastfeeding created three categories that were further divided into six subcategories.[5,6,7] Eight years later, the WHO created five categories.[6] The new set of definitions aimed to simplify the more detailed definitions that were developed in 1990. In doing so the ability to account for differences in the volume of complementary feedings and the proportion of breast milk was lost. In 2010, with the aim of creating classifications that take into account the proportion of breast milk feeding, the Association of Women's Health, Obstetric and Neonatal Nurses proposed a new set of definitions.[8] Table 1 compares the content for each of the three categorical definitions.

Data Collection

BMF initiation rates are commonly captured during the hospital stay in the United States, although there is not a standardized method for collecting BMF data in the research or outpatient settings.[5,6,7,8,9] While there is no established standard for measuring and reporting BMF data, the three definitions presented in Table 1 are the most frequently used definitions in the literature. It is important to note that these definitions do not differentiate clearly between feeding an infant directly at the breast and feeding of breast milk through any modality, such as bottle, cup, or other supplemental device, nor do they capture lifelong BMF exclusivity.

Methods used to measure the duration of exclusivity have an influence how the data collected is interpreted. Exclusivity recall from the past 24 hours may garner different results than if the recall were over one week, one month, or many months.[10] How the information is gathered – interview with mothers, feeding logs, or a combination, may also yield different results.[11,12] Few studies have attempted to validate accuracy in recall verbally versus feeding logs, although one study was able to validate verbal recalls and written feeding logs.[12] When questions are asked appropriately and in a standardized manner, data collected through a verbal recall can be as accurate as a written point in time log.[12]

Background of Project Setting

The outpatient, primary care pediatrics practice this project was conducted in serves a diverse, low-income population. Parents are recruited to become patients prenatally in the adjoining women's health practice and from the labor and delivery floor in the affiliated hospital.

Population

Understanding where a diverse population of infants and mothers fall on the spectrum of exclusive BMF, at what point in time exclusive BMF decreases to BMF and ultimately to no BMF, and why these changes occur can help practitioners target interventions.[3] The population within the pediatrics practice for which this tool was designed is demographically diverse with respect to race, age, marital status, and is of low socioeconomic status, factors that are known contributors to lower BMF rates.[3,4] Having reliable and accurate data about BMF exclusivity and duration rates will allow public health practitioners to know where to best target their efforts aimed at increasing both exclusivity and duration of BMF.

Current Practice

Increasing BMF rates is a core objective shared between the prenatal practice and hospital from which patients are recruited, and the pediatrics practice itself. Prenatally BMF education is conducted and classes are offered; during the hospital stay one-on-one support is provided and classes are offered; in the pediatrics practice BMF education and one-on-one support is offered on an as needed basis. Currently, requirements exist from the Joint Commission on Hospital Accreditation to collect data on BMF initiation and exclusivity rates during the hospital stay.

Need

No formal system exists to capture rates once the mother and infant have been discharged from the hospital. A clear, consistent method of collecting BMF data, as well as concise definitions of exclusivity, in an outpatient, primary care pediatrics setting is important to improving public health.

Tool

Creation of a standardized BMF exclusivity tracking tool to be implemented in an outpatient, primary care pediatrics practice, with questions asked by pediatricians, will allow practitioners to target interventions to effectively promote BMF exclusivity and increase duration of BMF. It will also provide a source of data from which further research on BMF and health outcomes can be conducted.

Methods

Literature Review Conducted

We conducted a literature review to determine how BMF is currently being defined and categorized. From this literature review we determined that standardized definitions of BMF duration and exclusivity are not used. Few have developed definitions of duration and exclusivity however these definitions are not used consistently in research. No standardized definitions are used in the outpatient, primary care pediatrics practice in which this project took place. Studies reviewed differed in their definition of BMF and often the parameters of measurement for the level BMF exclusivity and duration of BMF were not clearly defined.

In three of the most cited definitions, there is no consensus on terminology, percentage of BMF for exclusivity, nor interval of recall. Lack of standardization in definitions makes it difficult to compare study outcomes to one another and identify cause and effect of breast milk consumption. Variations in recall duration can impact the accuracy of the data collected as well as the effect of BMF on study outcomes.

Definitions of BMF Developed

The word breastfeeding is not inclusive of all modes of providing breast milk to an infant. To breastfeed is defined by Merriam-Webster as "to feed (a baby) from a mother's breast,"[13] thusly to breastfeeding is feeding a baby from a mother's breast. This does not account for other modes of feeding an infant breast milk including cup, bottle, or at the breast supplemental devices, to name a few.

We developed a hybrid of the three most cited definitions for use in the outpatient, primary care pediatrics practice. Taking into consideration the level of clarity desired, the term "breast milk fed" rather than "breastfed" was chosen to define the act of feeding an infant with breast milk. To retain the focus on breast milk feeds the level of BMF exclusivity is defined based on the amount of breast milk being fed. Exclusively breast milk fed, predominately breast milk fed, partially breast milk fed, minimally breast milk fed and exclusively formula fed. Each of these measures of exclusivity is correlated to a percentage of feeds from breast milk.

Feeding Recall

In research the duration of BMF is often based upon a 24 hour recall. While this eliminates much of the recall bias that may occur it does not take into consideration infant feeding patterns since birth. As research continues to emerge attributing BMF duration to positive health outcomes it is important to understand how that BMF data was captured, as a point in time recall or as lifelong data. Collecting lifelong data in standard interview methods, such as a survey or interview, when an infant is 6 months or 1 year can be confounded by recall bias, making it difficult to properly determine the lifelong level of BMF exclusivity.

While any percentage of BMF exclusivity is preferred to formula feeding only, the recommendations are to exclusively breast milk feed for six months. Our research site is a unique setting that lends itself to the longitudinal collection of data. Here, patients present at regular intervals, helping to eliminate the long duration between interviews. Longitudinal tracking of BMF exclusivity eliminates much of the recall bias and allows for more exact tracking of exclusivity rates over the course of a infant's first six months of life.

Documentation of Data

We determined that data would be best captured in the pediatrician's assessment note, as feeding questions are already asked. We determined that alteration of the existing assessment note template was the best way to incorporate the standardized method of data collection. Here, pediatricians will be able to document the mode of BMF (at breast or supplemental device), and if formula is being given, in a standardized drop down list, rather than the narrative they currently write. We also added a 'reason for non-exclusive BMF' question including top reasons for not exclusively BMF to help tailor future interventions.

We determined that BMF exclusivity will be measured at the first newborn visit asking recall since birth, one week of life asking recall for the past week, two weeks of life asking recall of past week, one month of life asking recall of past two weeks, and then monthly until six months, asking recall of one month. This corresponds to the follow up schedule for infants already in place in this pediatrics practice. Frequent data collection with his schedule of visits reduced the recall period increasing the likelihood for accurate data collection.

The assessment section of the pediatrician note was identified as an ideal location for a drop down list to categorize the infant as exclusively breast milk fed, predominately breast milk fed, partially breast milk fed, minimally breast milk fed, or exclusively formula fed. An educational schematic was developed to aid the pediatricians in categorization of exclusivity of BMF.

Results

Standardized Definitions

We created of standardized definitions of BMF exclusivity through synthesizing the three most cited definitions while enhancing applicability to the outpatient setting. Standardizing language to be inclusive of BMF at the breast and BMF through another modality as well as creating clear categorization for intensity of BMF was important. The subsequent definitions are outlined in table 2, alongside the definitions that served as their foundation.

In addition to creating standardized definitions to categorize BMF exclusivity we developed questions to determine life-long exclusivity. Having a method to determine the duration of BMF exclusivity at regular intervals, including since birth or since last visit, strengthens the data collected. The physician education schematic outlines how to determine the duration of exclusivity (Figure 1).

Education Schematic

Since pediatricians will be the ones asking mothers and caretakers how their infants are fed and documenting in a standardized way, it is important to have an tool for educating pediatricians on

the definitions and how to determine classification of exclusivity and duration. Figure 1 outlines the method to categorize the infant's BMF exclusivity intensity while also determining the duration of the exclusivity.

Language for Tool in EMR

Utilization of standardized language in the electronic medical record is imperative for consistent data collection. Currently, feeding data is collected in narrative form within the subjective section of the pediatrician's note. Changing this narrative section to a formalized, multi-select drop-down list allows for the pediatrician to document feeding behavior in a standardized way. Figure 2 represents various drop-down lists available for the diet section. Each heading allows for multi-selection to fully capture the variation in feeding mode and nourishment. A placeholder, represented by ***, was added to allow for free texting of information where appropriate.

An important attribute of this drop down list is the inclusion of reasons for non-exclusive BMF. Included here are commonly named reasons for non-exclusive BMF, with the option to free text any reason given that is not listed.

We determined that the BMF exclusivity tracking tool should be added to the EMR in the assessment section of the pediatrician's note. The tracking tool is a drop-down list to document the categorization of BMF exclusivity. Figure 3 represents the standardized definition categories in which the infant's feeding pattern will be classified. These are not multi-select; infant feeding should be classified into only one level of exclusivity. A placeholder, represented by ***, was added to allow for free texting the time frame of exclusive BMF.

Discussion

Goal of Tracking

The goal of creating a standardized BMF tracking tool was to have consistent language and method to collect BMF data in the outpatient setting.

From this standardized documentation of both feeding behavior and exclusivity category, data can be extrapolated for future research and/or interventions. Collecting BMF duration and exclusivity intensity in a standardized way will provide data for secondary analysis. This data, collected with clear, standardized definitions and a limited recall timeframe, will help strengthen existing evidence of health correlations related to BMF. Additionally, a standardized method of collecting reasons for non-exclusive BMF will help practitioners to best target interventions, for both caregivers and providers, to increase exclusive BMF rates.

Tracking BMF rates in the hospital setting requires facilities to be accountable for the education, support, and medical treatment of women and infants. If this data was collected in the outpatient setting, facilities could be held accountable in the same way as hospital settings, with the added advantage of flexibility to initiate interventions and monitor outcomes.

Tool Implementation

Implementing a new way to document in the EMR will require the assistance from the EMR team, review and support from inter-professional staff members, as well as education of

pediatricians on accurate documentation. This BMF tracking tool is in its initial stage of development. Additional inter-professional review and edits prior to implementation will strengthen the tool and increase future participation in accurate documentation.

Limitations

One limitation of this BMF tracking tool is the lack of consideration for intake from other nourishment sources beyond breast milk and formula. While the AAP recommends no other forms or nourishment are to be provided to infants before six months of age that does not mean that caregivers always refrain from providing alternative nourishment sources to their infants before six months. Since the framework for BMF exclusivity intensity is written in relation to breast milk consumption other forms of nourishment could potentially be accounted for within the formula consumption however this is not explicitly noted.

Recommendations

This tracking tool needs to be pilot tested, reviewed, and evaluated upon initial implementation. We will need to assess the accuracy of EMR tracking tool completion before data can be extracted and used for future interventions and/or research purposes. Once the tool has been implemented in the EMR, chart reviews and comparison to feeding logs can be used to validate accuracy of documentation.

Conclusions

Currently, no formal definition of BMF exclusivity, nor a way of collecting data, exists for use in an outpatient, primary care pediatrics practice. Having standardized definitions of BMF exclusivity and a standardized method to determine duration of exclusivity is valuable to improve public health. From this data interventions can be tailored to at risk populations with the aim of increasing BMF duration and exclusivity throughout infancy. Additionally, rigorous research relating BMF exclusivity and duration to health outcomes can be completed without the confounder of unclear definitions of feeding.

The definitions and exclusivity tracking tool still need to be validated and piloted before accepted as standard but are a starting point to improve BMF data collected in the outpatient setting.

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Tables

Table 1. Current Breast Milk Feeding Definitions

Organization	Interagency Group for Action on Breastfeeding [5,6,7]	World Health Organization[6,7]	Association of Women's Health, Obstetric and Neonatal Nurses[8]
Year	1990	2008	2010
Degree/Intensity			
I	**Full Breastfeeding:** • **Exclusive:** breastfeeding only, no other liquid or solids given • **Almost Exclusive:** breastfeeding with vitamins, minerals, water, juice, or ritualistic feeds given	**Exclusive Breastfeeding:** only breast milk with no other liquids or solids given with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines	**Exclusive Breast Milk:** breast milk only, allows drops, syrups (vitamins, minerals, medicines)
II	**Partial Breastfeeding:** • **High:** >80% of feeds breastfeeding • **Medium:** 20-80% of feeds breastfeeding • **Low:** <20% of feeds breastfeeding	**Predominant Breastfeeding:** predominant source of nourishment is breast milk, may also receive water, water based drinks, fruit juice, oral rehydration salts, solution, drop and syrup forms of vitamins minerals and medicines, ritual fluids with no other fluid based foods	**Predominant Breast Milk:** breast milk >75% of diet, allows water, juice, artificial milk, or solid foods
III	**Partial Breastfeeding:** • **High:** >80% of feeds breastfeeding • **Medium:** 20-80% of feeds breastfeeding • **Low:** <20% of feeds breastfeeding	**Complementary Feeding:** both breast milk and solid or semisolid food	**Mixed Feeding:** breast milk 25-75% of diet, allows water juice, artificial milk, or solid food
IV	**Token Breastfeeding:** Minimal, occasional, irregular breastfeeds	**Breastfeeding:** breast milk and solid or semi solid foods	**Predominant Artificial Milk:** breast milk <25% of diet, artificial milk >75% of diet includes water, juice, or solid food
V	NA	**Bottle Feeding:** liquid or semisolid food (including breast milk) from a bottle with a nipple/teat.	**Exclusive Artificial Milk:** artificial milk only, allows drops, syrups (vitamins, minerals, medicines)

Table 2. Breast Milk Feeding Definitions with Definitions for Outpatient Pediatrics Practice

Organization	Interagency Group for Action on Breastfeeding [5,6,7]	World Health Organization[6,7]	Association of Women's Health, Obstetric and Neonatal Nurses[8]	Outpatient Pediatrics Practice
Year	1990	2008	2010	2015
Degree/Intensity				
I	**Full Breastfeeding:** • **Exclusive:** breastfeeding only, no other liquid or solids given • **Almost Exclusive:** breastfeeding with vitamins, minerals, water, juice, or ritualistic feeds given	**Exclusive Breastfeeding:** only breast milk with no other liquids or solids given with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines	**Exclusive Breast Milk:** breast milk only, allows drops, syrups (vitamins, minerals, medicines)	**Exclusively Breast Milk Fed:** fed only breast milk, allows drops, medications
II	**Partial Breastfeeding:** • **High:** >80% of feeds breastfeeding • **Medium:** 20-80% of feeds breastfeeding • **Low:** <20% of feeds breastfeeding	**Predominant Breastfeeding:** predominant source of nourishment is breast milk, may also receive water, water based drinks, fruit juice, oral rehydration salts, solution, drop and syrup forms of vitamins minerals and medicines, ritual fluids with no other fluid based foods	**Predominant Breast Milk:** breast milk >75% of diet, allows water, juice, artificial milk, or solid foods	**Predominantly Breast Milk Fed:** >75% of intake from breast milk, <25% of intake from formula
III	**Partial Breastfeeding:** • **High:** >80% of feeds breastfeeding • **Medium:** 20-80% of feeds breastfeeding • **Low:** <20% of feeds breastfeeding	**Complementary Feeding:** both breast milk and solid or semisolid food	**Mixed Feeding:** breast milk 25-75% of diet, allows water juice, artificial milk, or solid food	**Partially breast milk fed:** 25-75% of intake from breast milk, 25-75% of intake from formula
IV	**Token Breastfeeding:** Minimal, occasional, irregular breastfeeds	**Breastfeeding:** breast milk and solid or semi solid foods	**Predominant Artificial Milk:** breast milk <25% of diet, artificial milk >75% of diet includes water, juice, or solid food	**Minimally Breast Milk Fed:** <25% of intake from breast milk, >75% of intake from formula
V	NA	**Bottle Feeding:** liquid or semisolid food (including breast milk) from a bottle with a nipple/teat.	**Exclusive Artificial Milk:** artificial milk only, allows drops, syrups (vitamins, minerals, medicines)	**Exclusively Formula Fed:** fed only formula, allows drops, medications

Figures

Figure 1. Physician Education Schematic

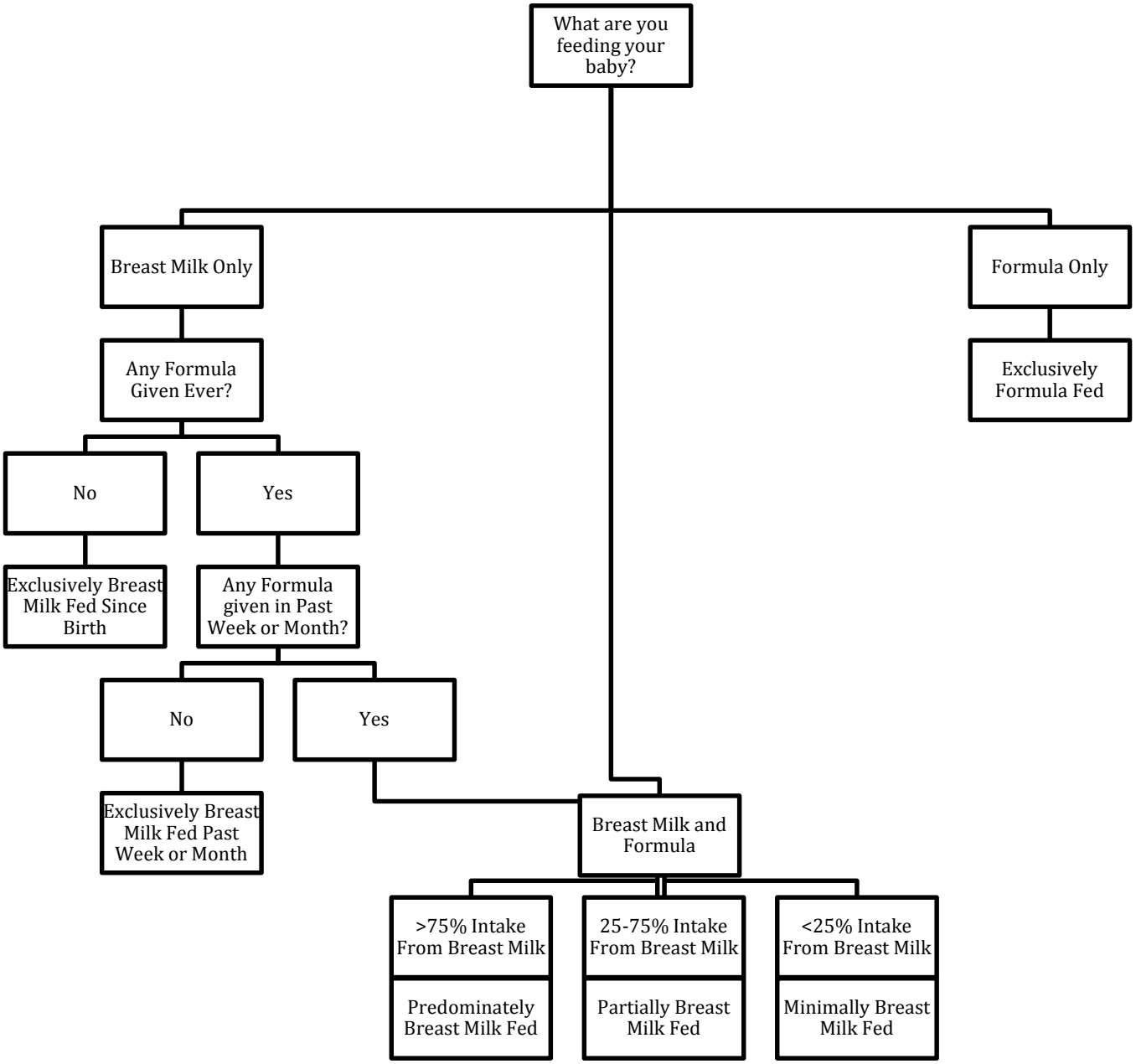


Figure 2. Documentation for Diet Section EMR

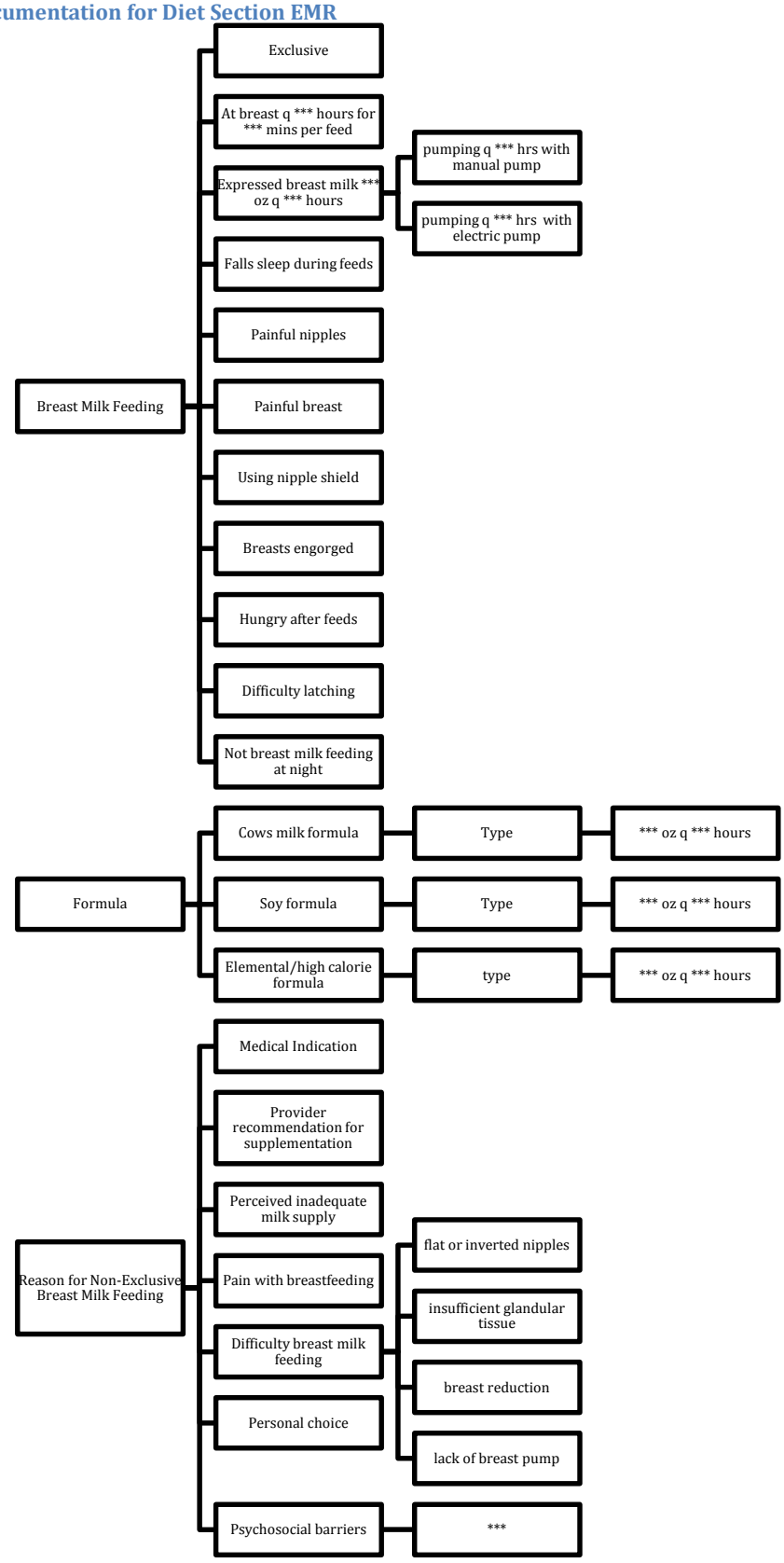
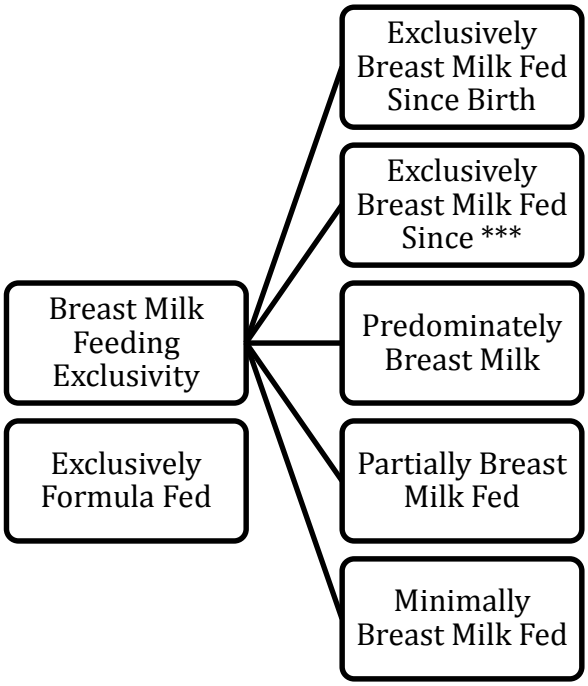


Figure 3. Breast Milk Feeding Exclusivity Categorization for EMR



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Title of paper Development of an electronic medical record breast milk feeding exclusivity tracking tool for an outpatient, primary care pediatrics practice.

Category of paper (circle one): **Practice Project Report** Research Project Report Policy Analysis

Grant Proposal Written Plan for a Program Evaluation of an Existing Program Manual

Systematic Review of the Literature Other _____

Reviewer_____Daliah Heller_____ **Date**___12/9/15_____

C = Completely S = Substantially P = Partially N = Not at all N/A = Not applicable

	C	S	P	N	N/A	Comments
1.Provided a **Structured Abstract** (180 words)	X					
2.Provided an accurate **Table of Contents**	X					Unnecessary sub-categories within each section of the paper.
3.Provided an **Introductory** section including:						
*a. **Scope** of the problem and public health s**ignificance***	X					
*b. Summary of **relevant scientific knowledg**e and policies*	X					
*c. Identification of relevant **gaps in knowledge***	X					
*d. Clear **rationale** for the project*	X					
e. Summary of what will be covered in the paper (aims)		X				This info is here, but is not presented in one concise statement
f. Clear description of research conducted or project undertaken (and student's role in the process)	X					
4. Described the **Methods or Processes** including:						
a. Population, setting, sites and sample (if relevant)		X				This information was mixed between the Intro and Methods section (see comments in paper)
b. Description of information/data collection procedures and measures (qualitative or quantitative)or Process used to develop project		X				
c. Relevant data manipulation & analytic techniques used					X	
5. Presented **Results or Project Outcomes**, incl:						
a. Description of sample characteristics, or description of process outcomes					X	
b. Descriptive information on relevant risk factors and outcomes , or on curriculum, intervention or policy components that were assessed, adopted or tested	X					
c. Subgroup analysis, as appropriate					X	

	C	S	P	N	N/A	Comments
d. Clearly labeled graphs and figures	X					
e. Correctly used & interpreted measures and/or statistical tests					X	

C = Completely S = Substantially P = Partially N = Not at all N/A = Not applicable

	C	S	P	N	N/A	Comments
6. Synthesized findings in a **Discussion Section**, including:						
a. Succinct synthesis of results		X				
b. Interpretation of results in context of literature	X					
c. Summary of strengths and limitations of project	X					
d. Recommendations based on study or project findings and a conclusion/take home message	X					
7. Organized paper logically and in accordance with instructions, including:						
a. Correct length (3000-5000 words) and format (subheadings, margins, spacing)		X				
b. At least a minimum of 15 references, including ≥6 peer-reviewed sources				X		Only 13 references
c. Complete references, using AJPH format	X					
d. Proper attribution for all facts	X					
e. Correct spelling and grammar		X				
8. Organized paper in a clear and effective **style,** including:						
a. Ideas within & between paragraphs laid out in a clear & logical fashion			X			Over-reliance on sub-headings obfuscated flow of the paper, which is already somewhat present
b. Clear paper flow; readable			X			Need to reorganize some paragraphs into different sections; see notes in the paper
c. Appropriate language for scientific writing	X					

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__X__ This paper should be acceptable once the author makes the indicated revisions.

_____ This paper should be acceptable once the author makes the major revisions indicated.

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- Don't rely on subheadings to clarify paragraph topics. Instead, use language transitions to introduce each new topic to be covered.
- Need to distinguish clearly between the Methods and Results in this project, because while it is formative research, these reflect different stages of the project

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Part I: The Culminating Experience

Introduction
This handbook was developed for CUNY SPH students who are completing one of the following degree programs:

Specialization	**Degree**
Community-based Public Health & Health Equity	MPH
Community Health Education	MPH
Environmental & Occupational Health Sciences	MPH
Environmental & Occupational Health Sciences	MS
Epidemiology and Biostatistics	MPH
General Public Health	MPH
Health Care Policy & Administration	MPH
Health Policy & Management	MPH
Public Health Geographic Information Sciences	MPH
Public Health Nutrition	MPH

Although the capstone courses have different names and numbers, they share the same requirements for three major deliverables: (1) the writing assignment, (2) the presentation, and (3) the reflection. This handbook describe in depth each of these three major assignments and their various components. Guidelines, resources, and other helpful information are also presented. Capstone faculty must approve of the deliverables so students are advised to regularly consult capstone faculty.

Brooklyn College	**HNSC 7950X: Capstone Project** This course consists of a structured seminar aimed at allowing students to apply experiences gained during their graduate program and synthesize that knowledge and experience in the form of a major writing project. It is expected that students use a combination of synthesized evidence, theoretical models, and empirical research to answer a public health research question or practice problem using interdisciplinary perspectives. **HNSC 7999X: Thesis Research** Research for master's thesis supervised by a faculty member. Credit is not earned until the thesis is accepted. Students register for this course only once. **HNSC 7935X: Research Seminar II (taken with HNSC 7999X)** Examination of quantitative and qualitative techniques appropriate for research in the health sciences. Class discussions of each student's efforts in developing a master's thesis.
Hunter College	**PH 73800: Capstone Project** This course consists of a structured seminar aimed at allowing students to apply experiences gained during their graduate program and synthesize that knowledge and experience in the form of a major writing project. It is expected that students use a combination of synthesized evidence, theoretical models, and empirical research to answer a public health research question or practice problem using interdisciplinary perspectives.

Lehman College	**PHE 790: Capstone Project (for CBPHHE students)** This course consists of a structured seminar aimed at allowing students to apply experiences gained during their graduate program and synthesize that knowledge and experience in the form of a major writing project. It is expected that students use a combination of synthesized evidence, theoretical models, and empirical research to answer a public health research question or practice problem using interdisciplinary perspectives. **PHE 791: Workshop in GISc Research for Public Health (for GISc students)** An advanced examination of mapping and of new computer-aided technologies in the natural and social sciences, including research design and methodology and designing and conducting an independent GIS public health research project, conforming to generally acceptable professional geographical practices and techniques, under the supervision of faculty.

Core Competencies
Through the three major assignments of the capstone course, students demonstrate they have achieved the core public health competencies developed by the CUNY School of Public Health.

By the time you graduate, you are expected to be able to:
1. Apply the public health core functions of assessment, policy development and assurance.
2. Apply theories, concepts, models and methods to the design of public health research, policy and practice
3. Adhere to ethical and social justice principles and standards
4. Interpret and analyze public health literature and apply evidence-based research
5. Apply basic statistical and informatics techniques
6. Communicate public health information through oral, written, digital and visual presentation
7. Explain how social, behavioral, biomedical and environmental determinants affect population health
8. Design and evaluate interventions to prevent or control public health problems
9. Collect, analyze and interpret public health data
10. Engage and collaborate with diverse groups
11. Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection
12. Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions
13. Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered

Evaluation and Grading
Capstone faculty from the student's specialization has primary responsibility for guiding the student through the Capstone Project while the Faculty Mentor has primary responsibility for guiding the student through Master's Thesis.

The Capstone faculty member from the student's specialization assigns a grade to the written work, the portfolio, and other applicable assignments such as Blackboard posts or attendance. The presentation is assigned an average grade based on all faculty member evaluations. The Capstone faculty member from the student's specialization assigns the final grade for the course, as well. The minimum passing grade for the capstone course is "B."

Capstone Project	Master's Thesis	Presentation	Portfolio

	Hunter, Lehman, and Brooklyn	Brooklyn & Hunter	Hunter, Brooklyn & Lehman	Hunter and Brooklyn[1]
1st reader	Capstone faculty member in student's specialization	Faculty mentor	All capstone faculty members	Capstone faculty member in student's specialization
2nd reader	Non-capstone faculty member in any specialization	Capstone faculty member in student's specialization		

	Grade Weight by Campus		
	Brooklyn	Hunter	Lehman
Assignment			
Major writing assignment	70%	75%	60%
Oral or poster presentation of the major writing project	15%	15%	40%
Portfolio (required in order to earn a grade for the course)	5%	5%	
Participation	5%	5%	
Blackboard Posts	5%		
Total	100%	100%	100%

[1] Lehman College requires a Fieldwork reflection piece in place of a portfolio, which is graded as part of the Supervised Fieldwork course.

Part II: Writing Assignment

Students complete either a Capstone Project or a Master's Thesis. Both are described below:

Master's Thesis

A master's thesis refers to a paper that reports on original research, with the general expectation that the finished product is of publishable quality, meets professional standards, and is useful to some external audience (e.g. journal readers, practitioners, advocates, other researchers).

At Hunter, capstone students with a GPA ≥3.8 may opt to write a master's thesis in lieu of a capstone paper, with formal approval of the academic faculty advisor and a mentor. At Brooklyn College, any capstone student may elect to write a master's thesis as their capstone paper. Students are advised to make this decision one year before they expect to graduate.

Eligible students who choose the thesis must submit a detailed proposal to the capstone faculty member by the end of the semester preceding the semester in which the student expects to enroll in the capstone course (that is, one semester in advance). The proposal should be 2 to 4 single-spaced pages, it should outline and describe the project, and include the names of the master's thesis mentor and one or more additional reviewers. If the thesis falls in the category of research report, the plan must include background and significance, hypothesis, data and methods. The capstone faculty member reviews the plan, assesses whether the proposal is expected to be of publishable quality, and approves/disapproves it.

Format

Students writing a master's thesis must follow the guidelines for the particular journal to which they expect to submit the manuscript. Every journal has on online Information for Authors section that describes in detail requirements for style of the main text, length of the manuscript, references and artwork. The suggested length of the thesis option at Brooklyn is 40 to 60 double-spaced pages.

Publication

Students are strongly encouraged to submit their master's thesis for publication. Advisors can be co-authors on the paper, but generally, the student is expected to be the first author. Student and advisor should discuss and agree on the publication plan, co-authorship possibility, and order of co-authors before submission of the master's thesis proposal, and should ensure that the final authorship follows IJCME guidelines. No matter the type of major written work the student chooses to do, a summary of the work will be presented in a lecture format or as poster. Part III of this handbook provides the specifics on the two means of communicating their work to others.

Capstone Project

There are two types of capstone projects students may choose: a practice project/essay that is based on work conducted during the fieldwork experience, and a research project/essay that is based on original research and data analysis. MPH students in the Maternal, Child, Reproductive, and Sexual Health (MCRSH) concentration are required to conduct their fieldwork and write their capstone paper on a topic in MCRSH that is relevant to their area of specialization.

Practice Project/Essay: Students conducting a practice project identify a problem to be studied, systematically review the literature associated with the problem, plan, implement, and evaluate a program or intervention to ameliorate the problem, discuss the results or outcomes of the project, and present conclusions and recommendations based on the project.

Research Project Report: Students conducting a research project identify a problem to be studied, systematically review the literature associated with the problem, collect primary or secondary data (see below) about the problem (quantitative and/or qualitative), analyze the data in order to either answer research questions or support or refute a pre-selected hypothesis, discuss the results, present conclusions, and make appropriate recommendations based on the study, which might include the need for further research. GISc students and MS-EOHS students must select this option.

- *Primary data* collection and analysis for capstone is usually in the context of an ongoing study, but it is also possible for highly-motivated students to initiate an original study. In the latter case, the student must allow substantial lead time for research planning and Institutional Review Board (IRB) approval
- *Secondary data* analysis is research typically using an existing data set, or exploiting published data. The appropriate IRB approval may need to be obtained for any project that uses data gathered from human subjects. Even in cases where the data is de-identified, a *determination* must be sought from the IRB office

With the permission of capstone faculty, students may also select to write one of the following:

- **Policy analysis—**Students conducting a policy analysis would analyze the public health implications of a current or proposed policy. The project could include perspectives on economics and financing, need and demand, politics/ethics/law, or quality/effectiveness.
- **Evaluation of an existing program** – Students evaluating an existing program will provide a description of the program, explain the purpose of the evaluation, describe the methods and procedures used to evaluate the program, identify the logistics of carrying out the evaluation, and present the results of the evaluation.
- **Written plan for a program** – Students creating a plan for a new program will conduct a needs assessment, create a program mission, goals, and objectives, develop an intervention, describe how the program will be implemented, and explain how the program would be evaluated.
- **Grant proposal** – Students writing a grant proposal for a public health initiative will identify the problem for which the grant would be used, explain the significance, list the hypotheses/questions to be answered, review the literature associated with the problem, create goals and objectives, methods, create a timeline and budget, and explain how the intervention would be evaluated.
- **Manual** – Students creating a manual for a public health initiative will demonstrate the need for the manual, create goals and objectives for the manual, create a table of contents, develop the content for the manual, describe how the manual will be used, and explain how the manual would be evaluated.
- **Systematic review of the literature** – Students conducting a systematic review will define a study question, create a strategy to identify appropriate literature, read and review the literature, extract the appropriate information from the literature, summarize the findings, present conclusions, and make recommendations based on the systematic review. Students selecting this option must follow standard guidelines for conducting a review, such as STROBE or PRISMA. For more information on this option, refer to the AJPH Author Instructions.

Format and Structure of the Capstone Paper

The paper will take the form of a peer-reviewed journal article, such as articles that appear in the Research and Practice section of the *American Journal of Public Health* (*AJPH*). The main text of the capstone paper will be 3000 to 5000 words in length, excluding abstract, table of contents, references, tables, and figures. There will be a title page, structured abstract and table of contents, followed by the main text, references and then tables and figures (one to a page). If there is an appendix, it is placed at the end. Grammar, quality of writing, illustrations and overall presentation are considered when the paper is being evaluated. The paper follows the outline below.

1. Structured abstract (180 words)
2. Table of contents
3. Introduction & literature review/problem statement/background (750 - 1250)
4. Agency background, purpose and project rationale (450-750)
5. Methods/Project description/process (750-1250)
6. Results/Project outcomes (450)
7. Discussion, limitations, recommendations (450-750)
8. Conclusions (150)
9. References
10. Tables, graphs, figures, etc.
11. Appendices

Title page: Include title of the document, student's name, CUNYFirst number, email address, name of capstone advisor, date of submission, abstract word count, and text word count. Do not use a large format font or other decorations on the title page as they may interfere with entering comments in track changes.

Structured abstract: Summary of key points. The abstract should briefly describe: 1) the background and focus of the paper; 2) the methods utilized; 3) a summary of the results; 4) conclusions. Instructions for developing a structure abstract. Instructions for developing a structured abstract are available from the National Library of Medicine via this link.

Table of Contents: Insert electronically. Instructions for creative an electronic table of contents can be found via this link.

Introduction: Background including significance of public health issue. This section relates to the background of the paper, including a statement of the problem, and the specific aims of the study. The literature review section should contain scientific evidence from a variety of text and electronic sources including limitations of the research findings; relevant and appropriate information sources; and interpreted scientific information. Even if it is innovative, the paper should be presented so that it is related to an existing body of knowledge or work on the subject with review of the literature, and identification of the gap to be addressed by this paper. Statement of question you will address, which should integrate an understanding of the health status of the population; determinants of health and illness; factors contributing to health promotion; influencers of the use of health services; and/or policy and apply that understanding to the issue of interest. Variables relevant to public health are selected and defined. The research question should be clearly, concisely, and coherently stated at the end of the introduction.

Methods & materials: For research papers, a clear description of the methods or methodological model and theory (where applicable) that another public health professional might be able to use to replicate the findings. Any previously published procedures should be referenced in the reference section.

For practice papers, present the design of the project: Describe the project procedure in the sequence in which the project segments will be performed. Provide a Gantt chart. Describe each method or approach to be utilized, the population participating in the project, the project site. Provide information about the relevant institutional resources available to help complete your project. Provide a logic model. At a minimum, a practice project will require IRB determination, which should be mentioned in the Methods section.

IRB: Research projects will likely require IRB clearance. If your project is based on some aspect of your fieldwork experience, you should have IRB clearance already. In that case, you do not need additional clearance. However, if your capstone paper in not related to your fieldwork, IRB clearance is required for capstone. In either case, attach a copy of any IRB application and/or IRB determination letter with your portfolio (discussed in Part IV).

Results: Present the collected data and analysis. Alternatively, utilize the relevant methodological model (and theory where applicable) to present and describe the finding of the assessment, or the plan for the service program, education campaign, or program evaluation.

Discussion/Future directions/Policy recommendation: Provide conclusions drawn from the data and analysis. The discussion should reflect the project findings, including unexpected results, and relate these to existing knowledge on the topic. Any difficulties encountered or recommendations for further study should also be included. If the student has completed an assessment, education or program plan, or evaluation project, he/she should highlight and summarize the significant issues. Limitations of the research or project should be addressed in this section. A brief presentation of next steps/future directions is appropriate and encouraged. The core competencies of public health practice should be addressed.

Conclusions and recommendations: Conclusions should be based on evidence and relevance to the core competencies of public health practice. The relevance of findings to public health practice and any limitations of the study/project should be discussed. Recommendations for program improvement, policy changes, and future study should be made as appropriate.

References: Every statement of fact in the text should be referenced and cited in the bibliography. Pertinent journal articles and reference texts should be cited. Unless otherwise instructed, use the *AJPH* style for all capstone papers, which is the same style used by the *Journal of the American Medical Association* (*JAMA*). Refer to the *AMA Manual of Style, 10th edition*.

Tables/Figures: Insert tables, illustrations or charts at the end of the text (after references). Do not insert them in the body of the text. (Inserting and attempting to place these items in Word is time-consuming and can cause formatting problems. Most journals require these items to be sent separately from the text. Typesetters at the journal integrate these items for publication.)

- ➢ Place tables after the references in the main text (insert a page break). Then insert tables, charts, illustrations one to a page separated by page breaks.
- ➢ Each table or figure should have a clear title and short description if relevant. Please ensure that sufficient information is provided so that the tables/figures can be understood standalone. Students using photographs or large files are advised to make the file small enough to be transmitted by email. Please ensure that any figures copied from other sources are fully referenced and redrawn as necessary. This can usually be done by re-formatting using the compress function. If this fails, make a special arrangement with the capstone faculty member.

Appendices: Supplemental material should be added to the main document set off by page breaks. Examples of appendix materials are questionnaires, data collection instruments or checklists, or data too lengthy to be published with the paper. This material must not make the paper too lengthy to email. The manuscript is ready to be submitted for review when you have completed the following checklist.

Yes	No	Objective
		The structured abstract provides a summary of the paper
		The background, rationale, and purpose for the project are clearly stated
		The methods are clearly described and appropriate for the purpose of the project
		The results are presented clearly, using tables and figures if appropriate
		The discussion relates the findings to the existing literature, identifies strengths and limitations, and describes any implications for public health

Submitting the manuscript for review

- Submit the manuscript as a single file to facilitate distribution and storage. Consider 4 or 5 megabytes as the maximum file size for email transmission and distribution. If the file is too large and cannot be emailed using the college email system, it is the student's responsibility to make the document email friendly (see below).
- The paper should be emailed to the student's capstone faculty member. That faculty member is responsible for forwarding the paper to the second reviewer.
- The subject line in your transmitting emails should be "Capstone Paper - *Lastname Firstname_ Paper title_Date*."
- The revised paper should be transmitted with a subject line "Capstone Paper revised - *Lastname Firstname_Paper title_date*"
- The response to reviewers should be transmitted with a subject line "Response to reviewers - Lastname *Firstname Paper Title_date*."

Grading the manuscript

The penultimate draft of the written assignment is reviewed by the capstone faculty and a second reader. Reviewers complete an evaluation rubric that uses this scale to evaluate the points listed below; the complete rubric can be found in the appendix. Keep these points in mind when writing the paper.

Evaluation	Score	Description
Excellent	4.0	All relevant concepts correctly applied
Good	3.5	Most relevant concepts correctly applied
Fair	3.0	Some concepts are correctly applied
Failing	2.5-0.5	Incorrect application of most relevant concepts
	0	Missing

1.	Structured abstract: summary of key points
2.	Effectively enables reader to anticipate the paper
3.	Readily identifiable, clear, concise, and coherent
4.	Significance, originality, and background
5.	Review of literature, analysis, assessment
6.	Results, discussion, consideration of limitations/weaknesses/strengths
7.	Evidence of critical thinking, and recommendations
8.	Items presented support thesis
9.	Clear, accurately summarizes paper
Demonstrates a clear understanding of the 5 public health disciplines:	
10.	Epidemiology
11.	Biostatistics
12.	Social and Behavioral Science
13.	Public Health Administration
14.	Environmental Health
15.	Correct referencing style; at least 12 peer-reviewed articles
16.	Effective use of headings and subheadings
17.	Basic mastery of written English: grammar, syntax, word usage, spelling, etc.
18.	Tables, graphs, maps, diagrams, photographs used

Final submission of manuscript

The penultimate draft of the paper that has been evaluated by two reviewers is returned to the student. Guided by suggestions and comments made by the reviewers, the student makes final revisions to the paper and composes a response letter. The letter and final draft of the paper are submitted together to the capstone faculty member, who grades it after reading it one last time.

Response letter
The response letter clearly states the changes made in the manuscript in response to the concerns expressed by the two reviewers. A justification must be provide if the student disagrees with any of the reviewers' suggestions. The appendix contains a template for a response letter. *Please use this style when composing your own response.*

Part III: Presentation

In addition to producing a major written report, all capstone students present an overview of their capstone project to fellow classmates, preceptors, academic advisors, capstone faculty members, mentors and other interested parties. This presentation occurs during the last weeks of the capstone semester. During the spring term, the

presentations coincide with the school's annual research day. Students choose to present a summary of their work in either a lecture or in a poster format.

Oral Presentation
Presentations must not exceed 10 minutes--with an additional 2 to 3 minutes of time for questions. The format for the oral presentation must include the following:

1. Title
2. Overview/Outline
3. Introduction/background
4. Project Methods
5. Results/Findings
6. Discussion
7. Conclusion
8. Acknowledgments

Organization is key when giving a successful 10-minute talk. Time is extremely limited so you need to know exactly what you want to convey and what information is necessary to convey it. The talk should have no more than **10-12 slides** - that means only about a minute to talk about each slide. And don't load more information onto one slide just to have fewer slides.

Start with a clearly defined problem and progress through the talk in a logical manner. State a question/ problem ("I was interested in the following question…"). How did you go about answering it? ("This is the strategy I used to answer the question…") What did you find? ("These are my results…") What do the findings mean? ("This is how I interpreted the results…")

Do not linger on the introduction and/or summarize the entire history of the field. Minimize time on background information in order to present methods, results and discussion. You should provide enough information to give a general understanding of why you are asking the question you are asking. The introduction should last no more than 1-2 minutes and consist of **1-2 slides.**

Data should be the bulk of your talk. The point of giving the talk is to present your data. Therefore, spend as much time as possible doing so. Do not be afraid to jump right into the data – limiting the use of transition slides allows for a smoother presentation. You do not need to go into extreme details of the methods used unless it is absolutely critical for proper interpretation of the data. If people are curious about how you did something, they will ask. Data should be limited to **3-6 slides** and last 6-8 minutes.

Have data tables or graphs and explain them. But, show only relevant data - anything more will just confuse the audience. Help the audience by 'walking through' each table or figure with a pointer. If you say "look only at this column" then take the other columns out! .

The conclusion is the part of the talk in which you interpret your results in light of the question posed at the beginning of the talk. An effective conclusion can fit onto **1 slide** and be stated in 1-2 minutes. *Do not include a reference slide. Don't end the presentation with "That's all."*

Breathe and relax. It is only 10 minutes and remember--you know more about your topic than anyone else in the room. **Don't panic** if you make a mistake.

Practice! Practice! Practice! This cannot be stressed enough. Go through the talk at least 2-3 times before actually giving it. You will be surprised how long it will be the first time around. Practice out loud, and edit the talk until you can do it in less than 10 minutes. Many times the presentation takes longer than you think it will. This will give you breathing room for questions and any technical difficulties. Practice with friends, other students, or even your advisor—they will have invaluable feedback.

Powerpoint Tips
1. Have one main point per slide. Do not show a collection of assorted data. Try not to use more than 4 or 5 bullets per slide
2. Try to use a font that is 28 point or larger for readability on a large screen

3. Make slides simple, clear, and easy to understand. If the audience is trying to figure out what the slide is showing, then they are not paying attention to what you are saying. You may use any design template in PPT -- but make sure that it is not too busy and does not distract the audience from the words/data on the slide
4. Expand margin lines of text boxes in order to increase font size for readability, but not to gain more space to add more information on the slide.
5. Slides should be free of nonessential information- other data will only distract and confuse. Do not show a table with comprehensive data; just show the important stuff. Save the rest for the paper!
6. Avoid using full sentences; use phrases and key talking points as a prompt for you to say more.
7. Avoid abusing PPT animation. A successful talk should rely on data, not Power Point prowess. More often than not, animation is distracting and sometimes even condescending.
8. Use Arial font. No gradient backgrounds (light backgrounds and dark text always works best). Most people use white background since colors show best (some use white/yellow text on a blue background. Use common sense with visual contrast: No black text on blue background.
9. Use notes portion of PPT to remember facts and things that you would like to point out for each slide. Remember to print out the notes pages of your presentation. DO NOT READ YOUR NOTES TO THE AUDIENCE

Poster Planning and Preparation

1) The preparation *process takes longer than you think,* so get started early. Write introduction and methods now!
2) Review text and poster approach with advisor and other major collaborators!!
3) Look for illustrations or photos to shorten needed text. They may be reproduced from books or slides via color photocopy.
4) Preparing a poster is very different from preparing a paper. Your main objective in preparing text for this presentation is to edit it down to concise language. Use bullets and numbers to break text visually and aid you in the interactive use of your poster.
5) A suggested title format is 90 pt Helvetica or a sans serif font, use bold as this reads better from a distance. Sub titles should be 72 pt.
6) Divide your title information into: Title; Name(s); Program; CUNY School of Public Health.
7) Within the poster presentation space divide information into - Introduction; Methods; Results; Summary; Acknowledgments (optional). Provide references in handout form as they are not necessary for poster presentations and reduce needed space.
8) Other poster text should be 18 pt; space and a half; bold. Never use smaller than 14 pt print. If your poster is legible when printed on A4 paper and held at arm's length, then it is about right.
9) Spell-check and proof text very carefully before your final print out.

Other Poster How-To's:

- ***Organization:*** Use headings to help readers find what they are looking for (fieldwork setting, objectives, results, conclusions, etc.). Most experts suggest a columnar format: top to bottom, left to right. The width of the poster should be greater than its height. Use pleasing and balanced arrangement of graphics, text, colors. Remember that people prefer shapes in the golden ratio, and tend to look at the top right corner.
- ***Less** is **more:*** Keep the verbiage to a minimum. Again, this is not simply pages of text. All text should be in fonts large enough to be read from 3-6 feet away (minimum font size: 18 pt). Titles should be in larger font sizes to be read from far away. Use simple fonts (e.g., Arial, Helvetica) and do not use more than 2 types.
- ***Colors:*** Use a theme of 2-3 colors; avoid overly bright (neon) colors. Dark colors on a light background are easiest to read.
- ***Graphics:*** Use graphics (simple charts, tables, graphs) and photos as appropriate. Not only do pictures help tell the story, they also help attract the audience.

Resources for Posters:

Designing conference posters (2015). Retrieved September 12, 2015, from http://colinpurrington.com/tips/poster-design/

Hess G, Tosney K, Liegel L. Creating effective poster presentations (2013). Retrieved September 12, 2015, from http://www.ncsu.edu/project/posters/.

Kirkeby K. Preparing professional scientific posters (n.d.). Retrieved September 12, 2015, from http://www.ce.umn.edu/~smith/supplements/poster/guide.htm

Reynolds G. *Presentation Zen*. *Simple Ideas on Presentation Design and Delivery, 2nd ed*. Berkeley: New Riders: 2011.

Part IV: The Portfolio/Reflection

Why is a portfolio required? The portfolio serves many functions:

- To provide a means of self-assessment indicating how you achieved core and concentration- specific competencies through master's courses and fieldwork, community service, and paid volunteer work experience.

- To demonstrate to the graduate faculty that you have attained at least entry-level public health competencies in the core public health areas. IOW: The portfolio is a means for faculty to assess educational outcomes.
- To provide information that will be used by the Council on Education in Public Health to assess the curriculum's effectiveness in providing students with the opportunities necessary to become competent in the core public health areas and in specialized areas.
- The portfolio is intended to be a useful career tool for you. With the portfolio, you should be able to promote yourself by showcasing your professional development, skills, experience. Your portfolio organizes critical information for potential employers while it showcases your accomplishments and abilities.
- Because learning and development are a continual part of professional life, a portfolio remains useful to you throughout your career. Keeping copies of your completed portfolio forms can help you demonstrate to yourself (and others) the paths you have taken and assist you in determining future growth and career directions.

Review and Evaluation of the Portfolio

The portfolio is submitted as a component of the capstone course. The capstone course is taken during the last or next-to-the-last semester of your graduate degree training. As the portfolio will not be returned to you, we urge you to keep an electronic copy for yourself.

You and your program academic advisor are responsible for periodically reviewing your portfolio. From time to time, your advisor will ask to discuss the portfolio with you. By tracking progress on achievement of competencies during your MPH/MS training, you can identify any areas that are deficient in your program of study and work with your academic advisor to make certain that those shortcomings are addressed before graduation. Courses and other learning experiences should be selected to strengthen competence in specific areas. Ultimately, the final product is evaluated by your capstone faculty member.

Components of the Portfolio

(1) Title page

This page contains general information for each student.

- Student's full name
- Contact information (address, phone, e-mail, fax)
- Area of specialization

(2) Table of contents

Insert a table of contents to make the portfolio easy to search.

(3) Professional mission statement

State your public health focus and your expertise, and how you expect to promote yourself as a public health practitioner. Write this as a concise statement of your individual, focused purpose in your public health career and the specific contribution you hope to make.

Reflect

- Think about your goals and how your unique knowledge, skills, and experience will help you reach those goals.
- Think about what you have to offer professionally as a public health practitioner and what specific contribution you can make to the public health field.

Write

- Communicate these thoughts in a concise professional statement that reflects your goals, focus and skills, and the contribution you expect to make to public health. Be as focused and specific as possible. "To improve the public's health" is neither focused nor specific; everyone with an MPH wants to do that.

Distinguish yourself from the others by indicating your specific area of focus and the specific way in which you hope to improve the public's health. You may want to consult the following resources which describe how to write an effective professional mission statement:

- State your professional mission and goals.
- Reflect on those mission and goals. As you reflect, you may find that you have refined your mission and goals over time.
- Discuss the extent to which you have realized your mission and achieved your goals.
- Suggest future actions you might take to further realize your mission and goals.

(4) Résumé
This section contains your professional résumé.

Minimum requirements include:

1. Name
2. Contact information
3. Education completed
4. Public health and other relevant work experience (in chronological order)
5. Honors and awards (chronological order)
6. Special skills

The career development office offers counseling and guidance for writing résumés, as well as other professional services. There are many sites on the internet with instructions for preparing resumes.

(5) Experience in public health
This section provides documentation and evidence of commitment and experience in the field of public health.

Minimum requirements include:

1. Certification of IRB training (CITI certificate)
2. A chronological list of all the public health experiences you have had. Include dates, agency name & address, your supervisor's name, credentials & title, your title and responsibilities. Use these section headings:
    - Paid professional experience
    - Volunteer experience
    - Fieldwork experience
    - Other

(6) Core competencies
In this section, indicate the extent to which you have acquired the core competencies required of all graduates of public health programs. Use the worksheet on the next page to explain how you know you have acquired each core competency. Your statement for each competency may be as long as needed. Where possible, provide in an appendix documentation that illustrates how you know the competency has been achieved, such as your written (or other) response to an assignment in a particular course, a letter acknowledging your paid or volunteer activity, a certificate of completion for a CE course, and so on. When you are attaching documentation, indicate in your statement the name of the document so we know what to look for in the appendix.

At Lehman, students complete two reflection assignments during Supervised Fieldwork. The first is to prepare an in-depth reflection paper that identifies and discusses the fieldwork experiences with regard to satisfaction with the extent to which learning goals were met, challenges encountered during the fieldwork experience and how they were addressed and how the fieldwork experience informed or influence the student's practice within public health. The second assignment is a public health organizational analysis of the setting where fieldwork was conducted. Under guidelines based on key core competencies, the student assesses the extent to which the organization applies the core public health functions of assessment, policy development and assurance to the development and analysis of public health problems and their solutions; applies ethical principles to public health activities; applies the core orientation and values of public health in professional practice. Specifically, students assess competencies by way of analysis of the leadership and management of the organization, staff competencies, organizational culture, degree to which organizational mission and goals are met, and evidence of commitment to health equity and social justice. The outcome of this assignment is to identify the implications for public health practice within the community served.

(7) Specialization-specific competencies
Students in these areas must provide evidence of membership in at least one professional organization related to their specialized area. Each specialization has its own competencies. These concentration-specific competencies specify the skills graduates need to have in order to receive the master's degree. In this section of the portfolio you provide documentation and evidence of competence in your specific program. Complete only the worksheet for your specialized area from the list above. Use the worksheet to explain how you know you have acquired each specialization competency. Your statement for each competency may be as long as needed. Where possible, provide in an appendix documentation that illustrates how you know the competency has been achieved, such as your written (or other) response to an assignment in a particular course, a letter acknowledging your paid or volunteer activity, a certificate of completion for a CE course, and so on. When you are attaching documentation, indicate in your statement the name of the document so the public health faculty member who is reviewing your portfolio knows what to look for in the appendix.

(8) Community service
This section provides documentation and evidence of community involvement and service outside of the academic environment. Include at least two examples of community involvement.

(9) Fieldwork
This section provides documentation and evidence of the student as a reflective public health practitioner. Fieldwork may include aspects of your employment in a healthcare, public, occupational or environmental health agency.

Minimum requirements include:

1. List of fieldwork placements. For each, provide: dates, preceptor (name, credentials, title), your responsibilities, tangible products of the fieldwork experience
2. Reflections about your fieldwork experiences, including:

    - Reflections on the extent to which your course work at Hunter prepared you for the fieldwork experience.

    - Reflections on the quality of on-site supervision you received during your fieldwork. Was someone generally available to answer your questions and provide feedback (even if you didn't seek it)? Discuss the usefulness and value of the feedback you received.

    - Reflections on challenges or problems you encountered during the fieldwork and how they were addressed. What technical or human obstacles did you encounter? Were there any deviations from your original plan or expectations for the fieldwork (for better or worse!). Discuss things you hoped to get out of the fieldwork experience, but didn't.

- Reflections on the overall quality of the fieldwork. Were there particular skills, knowledge or lessons that you acquired unexpectedly? Explain. Was the fieldwork a good educational experience – why or why not? How did it provide you with a better sense of the skills needed for employment in the profession? Discuss recommendations for improving your fieldwork experience. What were the most valuable lessons you learned? Explain why you would or would not recommend that other students conduct fieldwork with the same department or agency.

(10) Other

Use this section to present and discuss other topics that have contributed to your professional development. Some examples of additional areas include leadership activities, conferences attended, non-credit courses completed, and track-specific competencies attained outside of your specific area.

APPENDIX

Contents

1 Capstone paper evaluation rubric

2 Response letter template

3 Oral presentation evaluation rubric

Appendix 1: Capstone Paper Evaluation Rubric

Student's Name_____

Degree MPH in_____ or EOHS-MS_____

Title of paper_____

Category of paper (circle one): Practice Project Report Research Project Report Policy Analysis Grant Proposal Written Plan for a Program Evaluation of an Existing Program Manual Systematic Review of the Literature

Reviewer_____ **Date**_____

	Capstone Paper Grading Rubric	

	Description	4.0 **Excellent** All relevant concepts correctly applied	3.5 **Good** Most relevant concepts correctly applied	3.0 **Fair** Some concepts are correctly applied	**Failing**					
					Incorrect application of most relevant concepts					Missing
					2.5	2	1.5	1	0.5	0
OVERALL PAPER EVALUATION	Articulates ability to synthesize and apply public health competencies; discusses relevance of findings to public health practice									
Structured Abstract	Summary of key points; 250 words, maxi									
Introduction	Effectively enables reader to anticipate the paper									
Thesis Statement	Readily identifiable, clear, concise, and coherent									
Content (all items may not be applicable)	Significance, originality, and background									
	Review of literature, analysis, assessment									
	Results, discussion, consideration of limitations/weaknesses/strengths									
	Evidence of critical thinking, and recommendations									
Evidence	Items presented support thesis									
Conclusion and Recommendations	Clear, accurately summarizes paper									
Core Disciplines (Demonstrates	Epidemiology									

understanding and application of core public health disciplines)	Biostatistics					
	Social and Behavioral					
	Public Health Administration					
	Environmental Health					
References and Bibliography	Correct referencing style; at least 12 peer-reviewed articles					
Style	Effective use of headings and subheadings					
Quality of Writing	Basic mastery of written English: grammar, syntax, word usage, spelling, etc.					
Graphics	Tables, graphs, maps, diagrams, photographs used					

Recommendation

___Accent ____Accept with minor revisions ____Accept with major revisions ____Do not accept

Comments

Appendix 2: Response Letter Template

[Insert date here]

Dear Dr. *or* Professor *or* Ms. *or* Mr. [insert 1st & 2nd readers' last names]:

Re: Revisions to capstone paper, "[insert title of your paper]"

Thank you for your comments and suggestions on my manuscript. They were helpful and enabled me to improve the quality of my paper. The following pages contain point-by-point responses to your remarks. *My responses are in script.* I also use yellow highlight for additions, and ~~strikethroughs~~ for deletions. For example: "In accordance with the suggestions of the Reader, **[insert changes you made according to suggestions]**

I hope that you find the revisions in the manuscript and accompanying responses are satisfactory

Yours sincerely,
[insert your name, degrees & title, if appropriate]

----------new page ----------

Responses to the comments of Reader #1

1. [insert 1st reader's 1st comment; if the comment is lengthy, copy and paste it here directly from the reader's letter]
Response: **[insert your response]**

2. [insert 1st reader's 2nd comment: copy and paste it here directly from the reader's letter]
Response*:* **[insert your response]**

3. …and so on.

Responses to the comments of Reader #2

1. [insert 2nd reader's 1st comment: if the comment is lengthy, copy and paste it here directly from the reader's letter]
Response: **[insert your response]**

2. [Insert 2nd reader's 2nd comment: copy and paste it here directly from the reader's letter]
Response*:* **[insert your response]**

3. …and so on.

Appendix 3: Oral Presentation Evaluation Rubric

Student's name_____ **Reviewer**_____

Degree MPH in_____ or EOHS-MS_____ **Date**_____

Title of presentation_____

Category of work presented (circle one): Practice Project Report Research Project Report Policy Analysis Grant Proposal Written Plan for a Program Evaluation of an Existing Program Manual Systematic Review of the Literature

Oral presentation components	**Max score**	**Score**	***Comments***
Title	0		
Background and Significance	10		
Methods, or Project Description	10		
Results, or Project Outcomes	10		
Discussion and Conclusions	10		
Recommendations	10		
Overall presentation style and demeanor	40		
Handout	10		
Total	**100**		

Evaluation of Capstone Oral Presentation

1. Title of presentation _____
2. Brief background and significance of research/project (10 pts)
    a. Public health scope of problem
    b. Importance of project to public health community and knowledge
3. Methods or Project description (data collection etc…) (10 pts)
    a. Sample
    b. Data collection or description of processes (project paper)
    c. Analytic framework
4. Results or project outcomes (must include at least 2 tables for a research paper or at least 1 table for project paper) (10 pts)
    a. Table quality and ability to convey results
    b. Explanation of results
5. Discussion of results and Conclusions drawn from research or project (10 pts)
    a. Analysis, synthesis and interpretation of results
    b. Limitations and strengths
    c. Draws conclusions about results

6. Recommendations (which can include but not limited to additional research, policy and/or practical implications) (10 pts)
7. Overall presentation style and quality (40 pts)
    a. Speech quality
    b. Graphics
    c. Timing
    d. Response to questions
8. One-page handout (10 pts)

DPH Community, Society, and Health				
	CSH Specialization Competencies	**Specialization Courses**		
		Community Health Interventions: Theory and Methods (PUBH 810)	Social Behavioral Dimensions of Health: Theory and Methods (PUBH 811)	Evaluation of Public Health Programs and Policies (PUBH 816)
1.	Draw on social science and behavioral theories to analyze the impact of class, race, ethnicity, gender, disability and sexual orientation on the health of individuals and communities.		P	R
2.	Assess community needs, assets and capacity to promote health.	P	R	P
3.	Apply quantitative and qualitative or, when appropriate, mixed methods to community health research and evaluation.	P	R	P
4.	Investigate through multidisciplinary methods the potential implications and impact of policies and politics in health, education, justice, housing, welfare, child and family services and other sectors on individual and community health.	R	R	P
5.	Develop and teach educational curricula on community health using theories and methods from the social sciences and public health disciplines.	P	P	R

DPH Environmental and Occupational Health			
	EOH Specialization Competencies	**Specialization Courses**	
		Emerging Issues in Environmental and Occupational Health (PUBH 830)	Environmental and Occupational Health Risk Assessment, Management and Communication in Urban Settings (PUBH 831)
1.	Assess and analyze the influence of infrastructure (e.g., transportation, water supply/waste disposal systems and the built environment), global influences (e.g. climate change, energy use), and macro-social trends (e.g., affecting labor practices, immigration, and regulatory oversight) in creating or mitigating environmental and occupational health hazards.	P	R
2.	Identify and quantify the toxicological, physical, behavioral and susceptibility factors contributing to environmentally and occupationally-related illness and anticipate how these factors interact within the environment.	P	R
3.	Design research to identify, monitor, evaluate, or ameliorate occupational environmental hazards and/or their health effects using the appropriate methods and tools, which may include epidemiology, GIS mapping and spatial analysis, contaminant analysis, and developing community partnerships.	R	P
4.	Critically analyze environmental health risks within the current scientific, political, economic, social, cultural and regulatory contexts and use this analysis to develop management strategies that incorporate public participation, sustainable development, environmental justice and cumulative and competing hazards.	R	P
5.	Plan, direct, implement and evaluate occupational and environmental health programs appropriate for a variety of contexts including educational, government, and advocacy settings.	R	P
6.	Explain the impact of occupational and environmental hazards in a manner appropriate for the target audience including students, professionals, community, and advocacy.	P	P
7.	Demonstrate the leadership and teamwork skills appropriate for working with students, communities, organizations, health professionals and regulators in developing strategies for controlling occupational and environmental hazards.	P	R

DPH Epidemiology								
	EPI Specialization Competencies	**Specialization Courses**					**Other**	
		Epidemiologic Methods II: Study Design and Analysis (PUBH 821)	Epidemiologic Methods III: Seminar in Epidemiologic Methods (PUBH 822)	Epidemiologic Methods IV: Seminar in Applications of Epidemiologic Methods to Urban Health (PUBH 823)	Applied Biostatistics I (PUBH 824)	Applied Biostatistics II (PUBH 825)	Second Exam/Dissertation	Practicum
1.	Determine the influence of social, cultural, historical, behavioral and biological factors in population health.	R	P		R	R	R	R
2.	Operationalize studies of the complex interactions between multiple determinants of population health in a variety of settings, exploiting the differences between settings as a source of insight.	P	P	P	R		R	R
3.	Design and implement research projects that: a. Quantify health and the burden of disease in populations b. Perform surveys and risk factor analyses c. Apply causal inference to study design, study implementation and data analysis d. Identify vulnerable populations and their attributes; apply rigorous methods to examine and monitor health disparities e. Identify effective interventions to improve population health equitably f. Evaluate the effectiveness of interventions designed to improve population health g. Give appropriate attention to the potential for bias, as well as exposure and outcome measurement issues	P	P	P	P	R	P	P
4.	Conduct public health surveillance of diseases, events, and health states, as well as their risk factors and drivers.	R	P				R	R
5.	Demonstrate mastery of causal inference and apply these techniques to scientific questions relevant to at least two current public health issues or population groups that are relevant to the student's substantive content interests.	R	P	P	R	R	P	R
6.	Identify and apply appropriate biostatistical approaches to analyses that address epidemiological questions in public health research and practice.	R	R	R	P	P	P	R

7.	Present empiric findings persuasively to a wide array of audiences (oral and written)	R	P	R	P		P	R
8.	Work with colleagues to translate epidemiologic findings into practicable interventions	P	R		R		R	P
9.	Teaching epidemiologic methods to students, more junior colleagues or to others in public health		R		R			P*

* We do not require that the practicum experience include a teaching component, this is optional, so for students who chose to include teaching in their practicum experience this is a major focus or "P"

DPH Health Policy and Management					
	HPM Specialization Competencies	**Specialization Courses**			
		Seminar in Health Policy and Management (PUBH 840)	Quantitative Methods in Health Services Research (PUBH 841)	Public Health Economics (PUBH 842)	Health Policy Analysis Methods (PUBH 843)
1.	Assess and analyze the impact of public policy interventions within the various domains of public health, the theoretical motivations for undertaking them, the influence of the political, bureaucratic, and social environmental in which policy decisions are made, the consequences of such decisions.	P	P	R	P
2.	Understand and analyze the policy environment for healthcare organizations.	P		R	P
3.	For healthcare and public health organizations, discuss how each of the following affect organizational behavior and service delivery: organizational structure, motivation and incentives, individual and group behavior, group decision making, quality measurement and improvement, and organizational relations with their environments. Develop interventions to change at least 3 of the above to improve health care and public health service delivery and health outcomes.	P		P	P
4.	Understand organizational behavior and organization theory as frameworks for examining relationships between diversity and disparities in healthcare quality.	P			P
5.	Understand and appropriately apply analytical strategies used in health policy research, such as costing analysis, cost effectiveness and cost benefit analysis.		P	P	
6.	Develop familiarity with and critically analyze federal, state, and municipal laws/regulations and their historical context as relevant to public health management and policy decisions.	P		R	
7.	Formulate alternative options for resolving problems in health policy or management, evaluate their economic, practical, ethical, legal, administrative, and technical feasibility and recommend preferred options based on and supported by your analysis.	P	R	P	

MPH Epidemiology & Biostatistics (Biostatistics Track)						
	BIO Specialization Competencies	**Specialization Courses[1]**				
		Applied Biostatistics I (BIOS 75000)	Applied Biostatistics II (BIOS 75100)	Epidemiological Methods I: Study Research Design (EPI 75000)	Epidemiological Methods II: Survey and Research Methods (EPI 75100)	Applied Research: Data Management and Analysis (EPI 75200)
1.	Describe assumptions, procedures, strengths and limitations of statistical methods that are used in public health research	P	P	N/A	N/A	R
2.	Select statistical methods that are suitable for different purposes of analysis and different types of data	P	P	N/A	N/A	R
3.	Apply statistical methods correctly in public health research	P	P	N/A	N/A	R
4.	Use information technology and computer software effectively for collection, management, analysis and presentation of public health data	P	P	N/A	N/A	R
5.	Accurately describe computer outputs of those analyses and appropriately interpret the statistical results	P	P	N/A	N/A	R
6.	Write scientific reports of statistical analyses correctly with tables and figures	P		N/A	N/A	P
7.	Orally present statistical findings clearly and effectively	P	P	N/A	N/A	P
8.	Summarize correctly and critically evaluate statistical analyses in published literature	P	P	N/A	N/A	R

[1] Epidemiological Methods I (EPI 75000) and Epidemiological Methods II (EPI 75100) only address competencies in epidemiology

MPH Community Health Education						
	COMHE Specialization Competencies	**Specialization Courses**				
		Community Health Assessment (COMHE 75000)	Community Health Interventions (COMHE 75100)	Community Organizing and Development for Health (COMHE 75200)	Health Program Planning and Funding (COMHE 753)	Research and Evaluation for Community Health (COMHE 754)
1.	Apply social and behavioral theory and evidence to assess, plan, implement and evaluate community health programs, policies and interventions that promote health equality and reduce inequities.	R	P	R	R	R
2.	Demonstrate team building, negotiation, and conflict management skills in community health interventions.	R	R	P	R	
3.	Use qualitative and quantitative research methods to generate insight into community health issues.	P	R		R	P
4.	Apply ethical, socially just, and culturally competent principles and strategies to community organizing, community health assessment, program planning, implementation and evaluation.	P				R
5.	Engage communities to propose solutions to health inequities that recognize the role of power and stratification systems		R	P		

MPH Community Based Public Health and Health Equity					
	CBPHE Specialization Competencies	**Specialization Courses**			
		History and Philosophy of Public Health (PHE 700)	Health Equity and Social Justice (PHE 709)	Applications of Research Methods in Public Health (PHE 710)	Planning and Evaluation of Community-Based Programs (PHE 715)
1.	Analyze critical health inequalities confronting urban populations by social and economic determinants such as race, ethnicity, income and neighborhood	R	P	P	R
2.	Identify aspects of public health ethics and values of social justice that affect public health practice and decision-making	R	P	P	R
3.	Assess the health needs and issues confronting communities	R	R	P	P
4.	Synthesize theories, methods and practice of public health to address income inequities within communities	R	P	P	R

MPH Environmental & Occupational Health Sciences						
	EOHS Specialization Competencies	**Specialization Courses**				
		Occupational Health and Safety (EOHS 70200)	Environmental Chemistry (EOHS 70500)	Hazard Evaluation and Instrumentation (EOHS 74700)	Environment and Occupational Toxicology (EOHS 75400)	Environmental Audits and Remediation (EOHS 76500)
1.	Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	P	P	R	R	R
2.	Predict and prevent health, safety and environmental risks from processes, work tasks, the built environment and other economic and/or social activities	P	R	R	R	
3.	Evaluate the human health risks from CBPS hazards using qualitative, quantitative and/or instrumental assessment methods	R	R		P	P
4.	Recommend appropriate engineering, personal protection or administrative controls and policies for CBPS hazards and evaluate their effectiveness.	P		R	R	R

MPH Epidemiology & Biostatistics (Epidemiology Track)						
	EPI Specialization Competencies	**Specialization Courses[1]**				
		Applied Biostatistics I (BIOS 75000)	Applied Biostatistics II (BIOS 75100)	Epidemiological Methods I: Study Research Design (EPI 75000)	Epidemiological Methods II: Survey and Research Methods (EPI 75100)	Applied Research: Data Management and Analysis (EPI 75200)
1.	Identify key sources of data for epidemiologic purposes	N/A	N/A	P	P	P
2.	Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	N/A	N/A	P	P	R
3.	Critically read and evaluate the strengths and limitations of epidemiologic literature from a methodological perspective	N/A	N/A	P	P	R
4.	Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	N/A	N/A	P	P	R
5.	Identify key threats to validity (internal and external) within and across epidemiologic studies	N/A	N/A	P	P	R
6.	Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	N/A	N/A	P	P	R

[1] Applied Biostatistics I (BIOS 75000) and Applied Biostatistics II (BIOS 75100) only address competencies in biostatistics

MPH General Public Health					
	GPH Specialization Competencies	**Specialization Courses**			
		Conducting Community Needs and Strengths Assessment (HNSC 7163X)	Health Services Planning and Implementation (HNSC 7164X)	Program Evaluation in Community Health (HNSC 7171)	Research Seminar in Health Science I (HNSC 7930X)
1.	Apply approaches for improving the health status of populations, including a specific initiative for a target population	P	P	P	R
2.	Apply principles of planning, development and practice of organizational and community initiatives that relate to program planning, policy formulation or research	P	P	P	
3.	Use audience-appropriate written and oral communication to convey public health information	P	R	P	R
4.	Develop collaboratively public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served	R	R	P	
5.	Differentiate among evaluation methods in relation to their strengths, limitations and appropriate uses	P	R	P	R
6.	Analyze the effects of political, social and economic policies on public health systems at the local, state, national and international levels	R	P	R	

MPH Health Policy Management						
	HPM Specialization Competencies	**Specialization Courses**				
		Public Health Management (HPM 75000)	Public Health and Health Care Law (HPM 75100)	Comparative Analysis of Urban Health Care Systems (HPM 75200) OR Public Health Advocacy (HPM 75400)	Public Health Policy Analysis (HPM 75300)	Public Health and Health Economics (HPM 75500)
1.	Apply relevant theoretical/conceptual models and leadership principles to developing health policy and administrating health programs	P	R	R (HPM 75400)	P	R
2.	Evaluate public health programs and health policies and apply evaluation results to their improvement	R		R	P	
3.	Identify and discuss the partnership and collaborative skills needed to develop effective public health programs and policies	P	R	R	P	
4.	Analyze and critically evaluate theoretical and conceptual models used to describe the U.S. health care system and the delivery of health care	R	R	R (HPM 75200)	P	P
5.	Apply strategies for advocating for effective public health policies and programs		P	R	R	
6.	Identify and analyze the legal, economic, ethical and health bases and implications of public health policies that affect urban populations			R	P	P
7.	Identify non-public health policies and describe how they can mitigate or exacerbate health disparities and influence the health of urban populations				P	R
8.	Apply economic concepts and theories to the analysis of health care policy and management issues that inform decision-making and policy development					P

MPH Health Care Policy and Administration					
	HCPA Specialization Competencies	**Specialization Courses**			
		Planning, Strategic Analysis & Organizing of Health Care Services (HNSC 7141X)	Healthcare Policy and Administration in Public Health (HNSC 7142X)	Healthcare Financial management (HNSC 7143X)	Health Economics (HNSC 7144X)
1.	Demonstrate knowledge of political, economic and social context of health policies	R	P	R	R
2.	Examine, analyze and explain the intended and unintended consequences of national policies and reforms	R	P	R	R
3.	Discuss the policy process for improving the health status of populations	P	P	R	
4.	Discuss the legal and ethical bases for public health and health services	P	R	R	R
5.	Demonstrate leadership skills for building partnerships	R	P	P	
6.	Apply principles of program planning, development, budgeting, management and evaluation in organizational and community initiatives	R	R	P	
7.	Explain methods of ensuring community health safety and preparedness	P	R	R	
8.	Apply systems thinking for resolving organizational problems	P	R	R	

MPH Public Health Geographic Information Science					
	GISC Specialization Competencies	**Specialization Courses**			
		Environmental Health GISc Lab (PHE 704)	Principles of GISc for Public Health (PHE 705)	Spatial Analysis and Environmental Modeling for Public Health (PHE 706)	The Geography of Urban Health (PHE 717)
1.	Synthesize theories, methods, and practice of public health GISc	R	P	R	P
2.	Interpret and analyze cartographic information	R	P	P	R
3.	Analyze geographic health data in terms of spatial distributions and associations with other variables	R	R	P	P
4.	Identify, estimate, and analyze environmental exposures and evaluate their impacts on public health and social inequality	R	R	P	P
5.	Effectively communicate geographic health information through oral, written and visual presentations	R	P	R	R

MPH Public Health Nutrition							
	PHN Specialization Competencies	**Specialization Courses**					
		Community Health Assessment (COMHE 75000)	Principles of Public Health Nutrition (NUTR 71000)	Community Nutrition Education (NUTR 72000)	Nutrition and Human Development (NUTR 73300)	Food Politics and Policy (PH 72200)	Health Program Planning and Funding (COMHE 75300)
1.	Apply research methodology, interpretation of research literature and integration of research principles into evidence-based practice for public health nutrition	R	P	P	R	R	R
2.	Demonstrate effective oral and written communication and advocacy skills for public health nutrition	P	R	R		R	R
3.	Contribute to the design, planning, implementation or evaluation of community nutrition interventions as a member of an interdisciplinary team	P	P	P			R
4.	Identify and prioritize nutritional problems for individuals at various stages of the life cycle and for diverse population groups using appropriate assessment methodologies		R	P	P		
5.	Discuss the role of government and organizational systems and policies that influence accessibility, adequacy and safety of the food supply system (production, processing, distribution, consumption), and the relationship of food, nutrition and lifestyle choices in health promotion and disease prevention		R	R		P	
6.	Use social and behavioral theories to inform public health and nutrition research and practice		R	P		R	

MS Environmental & Occupational Health							
	MS EOHS Specialization Competencies	**Specialization Courses**					
		Occupational Health and Safety (EOHS 70200)	Environment and Occupational Toxicology (EOHS 7540)	Environment and Industrial Hygiene Laboratory (EOHS 74100)	Industrial Ventilation and Indoor Air Quality (EOHS 75500)	Principles of Industrial Hygiene (EOHS 75700)	Noise and Radiation Hazards and Controls (EOHS 76200)
1.	Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	P	R	R	R	R	R
2.	Predict and prevent health, safety and environmental risks from processes, work tasks, the built environment and other economic and/or social activities	P	R	R	R	R	R
3.	Evaluate the human health risks from CBPS hazards using qualitative, quantitative and/or instrumental assessment methods	R	P				R
4.	Recommend appropriate engineering, personal protection or administrative controls and policies for CBPS hazards and evaluate their effectiveness.	P	R		R	R	R

Last Updated August 28, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
BIOS 75000: Applied Biostatistics I
3 Credits
Fall 2015

Time and location	Wednesday, 6:05-7:50 pm, Silberman (2180 3rd Ave), Room C08
Instructor	Shiro Horiuchi, PhD Professor, CUNY School of Public Health 2180 3rd Ave, Room 521 Phone 212-396-7749 Shiro.Horiuchi@hunter.cuny.edu (preferred contact)
Office hours	Wednesday 4:00 – 5:30pm or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	A follow up course to PH 7500/75100 and PH 75200/75300, covering intermediate-level statistical methods commonly used in public health research. Topics include: simple and multiple linear regression; logistic regression; residual analysis; variable selection. Focus on practical applications, utilizing statistical software.
Course prerequisites	PH 750/751 and PH 752/753 or equivalents
Course format	This course is taught with a combination of lectures and in-class computer exercises using SPSS (for linear regression), SAS (for logistic regression) and Excel (for basic statistical analysis). All materials are available on the course website.
Required reading and resources	Ford AC, et al. 2005. *American Journal of Epidemiology* 162:454-460. Hall SL, Greendale GA, 1998. *Calcified Tissue International* 63:183-189. Simanek AM, Dowd JB, Aiello AE. 2009. *International Journal of Epidemiology* 38:775-787. Wisborg K, et al. 2001. *American Journal of Epidemiology* 154:322-327.
Suggested reading and resources	Fox J. *Applied Regression Analysis and Generalized Linear Models. Third Edition*. Sage Publications; 2015. ISBN-10: 1452205663, ISBN-13: 978-1452205663. (Second Edition is also all right.)

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Biostatistics-track Competencies		
Describe assumptions, procedures, strengths and limitations of statistical methods that are used in public health research	• Describe and explain the model equations, assumptions and estimation procedures of linear regression and logistic regression* * "Linear regression and logistic regression" in this table include both simple regression (one independent variable) and multiple regression (two or more independent variables)	• Mid-term and Final Examinations • Homework 1 & 2
Select statistical methods that are suitable for different purposes of analysis and different types of data	• Identify if linear regression or logistic regression is a suitable tool for investigating the research question with the given data, and assess its advantages and limitations*	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Apply statistical methods correctly in public health research	• Set up linear regression and logistic regression models that are suitable for the data and research question*	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Use information technology and computer software effectively for collection, management, analysis and presentation of public health data	• Run at least one of widely used statistical software packages to conduct linear regression and logistic regression*	• In-class Computer Exercises • Research Notes 1 & 2
Accurately describe computer outputs of those analyses and	• Interpret results of linear regression and logistic regression analyses; assess the extent to which the results support the initially	• Mid-term and Final Examinations • Homework 1 & 2

appropriately interpret the statistical results	proposed hypothesis; evaluate the predictive accuracy and reliability of the results; and examine if the results are consistent with the statistical assumptions of the methods and models*	• Research Notes 1 & 2
Write scientific reports of statistical analyses correctly with tables and figures	• Write scientific reports of linear regression and logistic regression analyses, with properly formatted and labeled tables and figures*	• Research Notes 1 & 2
Orally present statistical findings clearly and effectively	• Orally present results of linear regression and logistic regression analyses	• Research Notes 1 & 2
Summarize correctly and critically evaluate statistical analyses in published literature	• Correctly summarize results of linear regression and logistic regression analyses in published literature, and critically evaluate statistical aspects of the research*	• Research Notes 1 & 2
Epidemiology-track Competencies		
Identify key sources of data for epidemiologic purposes	• Describe the design of major US surveys (NHANES) and explain how this affects analysis of the survey • Conduct a web search to identify publicly available population-based health data to answer research questions	• In-class Computer Exercises • Research Notes 1 & 2
Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	• Compare the interpretation of absolute and relative risk • Apply methods to determine effect modification, including homogeneity and expected versus observed • Explain additive and multiplicative effect modification	• Research Notes 1 & 2 • Mid-term and Final Examinations • Homework 1 & 2

	• Apply descriptive and analytic statistics to describe the distribution of health conditions using publicly available data • Test hypotheses regarding associations of health with environmental, demographic, social and economic factors using publicly available data. • Use confidence intervals and p-values to assess statistical uncertainty using publicly available data	
Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	• Compare different methods for identifying confounders • Compare the biases generated by colliders and confounders • Discuss planning and evaluating epidemiologic studies, threats to validity and value of the inferences drawn from these studies • Construct a data analysis plan for a publicly available dataset that is appropriate given the study design used to collect that data and the research question being addressed	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	• Identify the type of data to be analyzed • Implement descriptive and analytic analyses in SPSS and SAS • Select appropriate statistical methods for the data type and the research question	• In-class Computer Exercises

Course Assessments

Descriptions on details about the assignments and grading criteria will be shown on the course website

Mid-term Examination: Students will take an in-class examination, about 50~60 minutes long, solving technical and computational problems that are mostly related to linear regression analysis.

Final Examination: Students will take an in-class examination, about 100 minutes long, solving technical and computational problems that are mostly related to logistic regression analysis.

Homework 1: Students will solve a set of technical and computational problems that are mostly related to linear regression analysis and submit the answers.

Homework 2: Students will solve a set of technical and computational problems that are mostly related to logistic regression analysis and submit the answers.

Research Note 1: A subset of data from a health survey will be provided. Each student will develop a hypothesis that could be investigated with the data, analyze the data using linear regression, and write a research report.

Research Note 2: A subset of data from a health survey will be provided. Each student will develop a hypothesis that could be investigated with the data, analyze the data using logistic regression, and write a research report.

In-class Computer Exercises: During the last 20~40 minutes of most classes, students will do computer exercises using computer terminals in C08, and upload their output files onto the assigned location of Discussion Board of the course website or submit them to the instructor by email after the class. The output files may be edited to remove results with errors.

Class Participation: Students should actively participate in the classes by asking questions to the instructor and orally responding to questions from the instructor during the lecture and in-class exercise.

Grading

Evaluation criteria

Evaluation criteria for research notes are described in the assignment instructions, which will be posted on the course website. In-class examinations are assessed primarily with respect to the accuracy of answers and the appropriateness of the approach adopted to solve the problems. In-class computer exercises and homework 1

and 2 are assessed primarily according to whether a sufficient amount of effort has been made. Class participation is assessed in terms of the quality and frequency of questions and replies.

The relative weight of each course component is as follows:

Assessment	Weight
Mid-term in-class examination	20%
Final in-class examination	25%
Research note 1	20%
Research Note 2	25%
Homework 1	2.5%
Homework 2	2.5%
In-class exercise and class participation	5%
	100%

The grading system for the course is as follows:

Letter Grade	Quality Points	Percentage
A+	4.0	97.0 - 100
A	4.0	93.0 - 96.9
A-	3.7	90.0 - 92.9
B+	3.3	87.0 - 89.9
B	3.0	83.0 - 86.9
B-	2.7	80.0 - 82.9
C+	2.3	77.0 - 79.9
C	2.0	70.0 - 76.9
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Attendance is required. No student will get a full point for "in-class exercise and class participation" if s/he misses more than 3 classes or the number of in-class exercise outputs that are not submitted in time is 3 or more.

Late/incomplete submission of assignments

Late/incomplete submission of Research Notes is not accepted. Late submission of Homework is not accepted. In-class exercise outputs are accepted if they are submitted by the end of the class or within 4 days after the class.

Make-ups, rewrites, and extra credit

With permission of the instructor, students may be allowed to resubmit research notes, homework assignments, and in-class computer exercise outputs before the due date.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Classes are offered in a computer laboratory. During the class, NEVER do any email work or website browsing unrelated to the class.
- Complete all assignments by their assigned due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- There is no group discussion in this course, but students are expected to participate actively in the classes, by asking scientific and technical questions to the instructor if there are any unclear issues, and by responding to questions from the instructor.

- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.
- Because in-class exercise outputs and homework assignments 1 and 2 are not returned with corrections or comments, students are expected to compare their outputs and answers with the model scripts/outputs and answer keys that will be posted on the course website.

Expectations for the instructor

- Provide course materials (including presentation files, data files, computer programs, assignment instructions, copies of or links to articles in the required reading list), regular announcements, reminders, suggestions on the course website.
- Answer questions asked by students during the class.
- Respond to students' email inquiries within 2 days.
- Provide students with individualized in-person instructions during their office-hour visits.
- Communication about grades and progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

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Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings/Resources	Assessment
1	9/2	Introduction to multiple linear regression 1: Basic models and partial regression coefficients (Part 1)	JF 5	ICE
2	9/9	Introduction to multiple linear regression 1: Basic models and partial regression coefficients (Part 2)	JF 5; HG	ICE
	9/16	9/16 - Last day to drop without a grade of "W"		
3	9/16	Introduction to multiple linear regression 2: Categorical independent variables	JF 7.1-2	ICE
	9/23	No class		
4	9/30	Introduction to multiple linear regression 3: Ordinary least squares and R^2	JF 5	ICE
5	10/7	Introduction to multiple linear regression 4: Statistical inference.	JF 6.1-2	ICE Homework 1 assigned
6	10/14	Issues in regression analyses 1: Examination of hypotheses on causal relationships I. Explanation of RN1. HW1 answers	JF 6.3 & 1.2	Homework 1 due Research Note 1 assigned
7	10/21	Issues in regression analyses 2: Nonlinearity (Mid-term in-class examination)	JF 12.3	Mid-term in-class examination
8	10/28	Introduction to logistic regression 1: Basic models	JF 14.1	ICE
9	11/4	Introduction to logistic regression 2: Adjusted odds ratio	JF 14.1; AF; KW	ICE Research Note 1 due
	11/9	Last day to withdraw with a grade of 'W'		
10	11/11	Issues in regression analyses 3: Interaction	JF 7.3	ICE
11	11/18	Introduction to logistic regression 3: Maximum likelihood estimation.	JF 14.1.4-5	
12	11/25	Issues in regression analyses 4: Examination of hypotheses on causal relationships II.	SDA	ICE Homework 2 assigned

				Research Note 2 assigned
13	12/2	Introduction to logistic regression 4: Ordinal and polytomous logistic regression.	JF 14.2	ICE Homework 2 due
14	12/9	(Final in-class examination)		Final in-class examination
15	12/16	Issues in regression analyses 5: Multi-collinearity, stepwise regression, partial and part correlation	JF 13	ICE
	12/20			Research Note 2 due

Keys: AF = Ford et al. 2005; HG = Hall & Greendale 1998; ICE = In-class computer exercise; JF = recommended textbook by John Fox; KW = Wisborg et al. 2001; SDA = Simanek Dowd & Aiello 2008.

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
BIOS 75100: Applied Biostatistics II
3 Credits
Fall 2015

Time and location	Silberman room C-06
Instructor	Levi Waldron, B.Sc., M.Sc., Ph.D. Best way to contact: levi.waldron@hunter.cuny.edu
Office hours	By appointment (www.calendly.com/lwaldron to schedule an appointment.)
Course website	https://bbhosted.cuny.edu/webapps/blackboard/execute/launcher?type=Course&id=_1185885_1&url=
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	A follow up course to BIOS 75000 Applied Biostatistics I, covering intermediate and advanced statistical methods commonly used in public health research. Topics include: log linear and generalized linear models; random and mixed effects models; survival analysis. Focus on practical applications utilizing statistical software.
Course prerequisites	Bios 75000
Course format	Hybrid: all classes available in person or online.
Required reading and resources	none
Suggested reading and resources	Vittinghoff E, Glidden DV, Shiboski SC, McCulloch CE. Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models (Statistics for Biology and Health). Springer; 2005.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Describe assumptions, procedures, strengths and limitations of statistical methods that are used in public health research	• Describe the assumptions necessary for statistical inference in generalized linear models, especially for regression models and models of count data • Describe the assumptions necessary for statistical inference in a repeated measures setting, both for traditional methods as well as random and mixed effects models • Recognize inherent limitations in both the data under study as well as the statistical method used to analyze the data	• Assignments 1-4
Select statistical methods that are suitable for different purposes of analysis and different types of data	• Explain censoring and recognize when it is appropriate to utilize Survival Analysis methods • Recognize connection and difference between Poisson and Negative Binomial regressions • Apply random and mixed effects models to account for within and between subject correlations. • Identify potential for over-fitting, develop and assess regression models in such situations appropriately.	• Assignments 2-4
Apply statistical methods correctly in	• Apply and interpret Poisson and	• Assignments 1-4

public health research	Negative Binomial regression models, Cox Proportional Hazard models, Linear Mixed Effects models, and Penalized Regression • Show competency in assessing model fit and modifying the models as well as finding alternatives when appropriate	
Use information technology and computer software effectively for collection, management, analysis and presentation of public health data	• Identify various public health data structures • Master the use of statistical software for analysis of public health data • Utilize statistical software to produce high quality graphical displays	• Assignments 1-4
Accurately describe computer outputs of those analyses and appropriately interpret the statistical results	• Show competency in interpreting computer output from Poisson and Negative Binomial regression models, Proportional Hazard models and Linear Mixed Effects models	• Assignments 2-4
Write scientific reports of statistical analyses correctly with tables and figures	• Produce data analysis reports of the highest quality as to their conciseness, readability and cohesion • Create appropriate tables and figures that adequately convey the key points of statistical analysis	• Assignments 1-4
Orally present statistical findings clearly and effectively	• Orally present your findings clearly and effectively • Incorporate feedback into improved data analysis report after in class “peer review”	• Oral presentation of one assignment
Summarize correctly and critically evaluate statistical analyses in	• Recognize research questions posed in published reports	• Assignments 1-4

published literature	• Reflect intelligently on analytic approach and data presentation in published research	

Course Assessments

Your understanding of the course material will be evaluated through a total of four (4) data analysis reports. Each student will be expected to present draft results in class and actively participate in the constructive critique/review of the work of his/her peers. You will have the chance to revise and resubmit each report after the first round of critique/review. This will give you the chance to deepen your analysis and bolster your mastery of the statistical methods.

Grading

Evaluation criteria

Rubrics provided with each assignment. Participation is based on handing in a rough draft of each assignment on time, effort put into presentation, and feedback provided through discussion forums and during presentations.

The relative weight of each course component is as follows:

Assessment	Weight
Assignment 1	20%
Assignment 2	20%
Assignment 3	20%
Assignment 4	20%
Participation	20%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw

from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

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Course Policies

Attendance and class participation

Participation will be assessed based on your project presentation, and ongoing participation in class and / or online discussion. You are required to be in class on the first day and on the one when you are presenting.

Late/incomplete submission of assignments

All projects will have a specific due date and will be returned to students within 7 days. Late homeworks will be penalized by deducting 10% from the earned grade per day, with no credit after 5 days unless prior arrangements for extenuating circumstances are made.

Make-ups, rewrites, and extra credit

Make-up assignments will be provided only under exceptional circumstances. In this case, the final grade will be the average of grades for the original and make-up assignments.

Expectations of students

Students are expected to attend every class either online or in person, and to attend in person on the day they are presenting. It is encouraged for students to help each other in figuring out how to do assignments, and to share pieces of code, however the work you hand in must be primarily your own, and any borrowed code must be attributed to

its author. Students are expected to participate in class discussions or online discussions, whether attending online or in person.

Expectations for the instructor

The instructor will be available for help through the online discussion forum, and by appointment (www.calendly.com/lwaldron to book an appointment). Appointments may be in person in room 538 of the Silberman building, by phone, or by Skype/Hangout. Students can expect an welcoming and respectful learning environment.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

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Course Schedule

The following schedule is subject to change (last updated: August 31, 2015).

For key dates regarding withdrawals etc, see:
http://www.cuny.edu/academics/calendars/fall-2015.html

Session	Date	Topic	Suggested reading
1	9/2 in-class attendance mandatory	**Introduction** • Review of syllabus • Review of linear and logistic regression • Introduction to R (time permitting)	4.1 - 4.6 5.1 – 5.3
2	9/9	**Generalized linear model (GLM)** • Analysis of variance and deviance table • Residual analysis • Multicollinearity	4.7 5.4 – 5.6
3	9/16	**Report 1: First Submission + Presentations and Critique**	
4	9/30	**Loglinear Models** • Analysis of multi-way contingency tables • Poisson regression for count data • Loglinear models as special case GLM **Report 1: Final Resubmission**	8.1-8.3
5	10/7	**Loglinear Models** • Negative Binomial regression for count data • Residual analysis and model diagnostics	4.2
6	**10/14**	**Report 2: First Submission + Presentations and Critique**	
7	10/21	**Basic Methods for Survival Analysis** • Life tables • Kaplan-Meier curves • Log-rank test **Report 2: Final Resubmission**	3.5, 6.1
8	10/28	**Cox Proportional Hazards Model** • Model specification • Residual Analysis	6.2, 6.4
9	11/4	**Extending the Cox Regression Model** • Stratification • Time-varying covariates • C-statistic for evaluating survival models	6.3
10	11/11	**Report 3: First Submission + Presentations and Critique**	
11	11/18	**Longitudinal Data** • Basic methods for longitudinal data • Covariance structures	7.1-7.5

		• Linear Mixed Effects Models • Variance components • Random intercept models **Report 3: Final Resubmission**	
12	11/25	**Multilevel/Hierarchical Modeling** • Random effects models • Extensions	handouts
13	12/2	**Advanced model assessment** • Cross-validation • ROC plots • Alternative measures of goodness of fit	handouts
14	12/9	**Report 4: First Submission + Presentations and Critique**	
15	12/23	**Regression with many variables** • Exploratory methods • Bias-variance tradeoff • Over-fitting • Penalized likelihood regression **Report 4: Final Resubmission**	handouts

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
COMHE 75000: Community Health Assessment
3 Credits
Fall 2015

Time and location	Silberman 329 Wednesdays 4:10-5:55pm
Instructor	Meredith Manze, MPH, PhD Assistant Professor Meredith.manze@hunter.cuny.edu (best way to reach me) Silberman Room 523 (212) 396-7736
Office hours	Wednesdays 3-4pm
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course prepares students to collect and analyze data on community health from a variety of sources, to identify problems and assets, and to develop objectives for community health interventions.
Course prerequisites	PH 75500
Course format	Lecture, partially online
Required reading and resources	Hodges, Bonnie C & Videto Donna M. Assessment and Planning in Health Programs. 2nd edition. Jones & Bartlett. 2011. Other articles available on BlackBoard
Suggested reading and resources	See last page

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply social and behavioral theory and evidence to assess, plan, implement and evaluate community health programs, policies and interventions that promote health equality and reduce inequities.	• Compare and prioritize health issues for action and community resources and capacity, based on epidemiological evidence, equity, feasibility and other considerations • Identify community level health and social indicators and specify whether appropriate tracking data exist or need to be collected	• Community map • Community Profile Part I • Community Profile Part II • Quiz #2
Demonstrate team building, negotiation, and conflict management skills in community health interventions.	• Design a process for establishing community or organizational health priorities and strategies through community dialog • Identify and incorporate principles of CBPR into a community health assessment • Formulate an assessment planning model that ensures participation for key community constituencies including beneficiaries of anticipated health promotion efforts • Describe the power dynamics involved in a particular community collaboration, the importance of these dynamics, and ways of addressing them	• Discussion board participation • Community Tour • Community Board Meeting
Use qualitative and quantitative research methods to generate insight into community health issues.	• Locate, analyze and interpret community-level qualitative and quantitative data on health from a variety of sources • Construct and deliver a presentation on the health of a community (overall or with respect to specific health	• Community map • Community Profile Part I • Community Profile Part II • Oral presentation • Community Tour • Community Board

	issues) that synthesizes data from multiple sources and incorporates community perspectives • Design, conduct and interpret community level qualitative research, using ethnographic observation, in-depth interviews and content analyses, using community sourced documents or texts	Meeting • Quiz #1
Apply ethical, socially just, and culturally competent principles and strategies to community organizing, community health assessment, program planning, implementation and evaluation.	• Practice reflexivity with respect to one's own social position vis a vis the community being assessed.	• Community Impression

Course Assessments

You will be assigned to a community district which will be the subject of the following assignments: community impressions, community tour, community board meeting, community map, community profiles I & II and your oral presentation. Despite being assigned in groups to districts, the only assessments that should be done as a group are the two profile papers. The oral presentation should also be done as a group but you will receive an individual grade. All other assessments should be completed independently and without the help of group members. The page limits listed below for each assignment do not include tables, figures or references. Please keep these at the end of your papers so I am able to easily assess if you are within the page limits. To be clear, a page length of 2-3 pages means at least two pages but no more than three pages (so it ends somewhere on the second or third page). All written assignments will be scanned in BlackBoard for plagiarism via SafeAssign. You will be able to review your score. You will have 2 attempts to upload each assignment to BlackBoard (so if you receive a high score for copied text in the first submission, not related to quotes or citations, it is up to you to review and edit and resubmit before the deadline). Allow yourself time for potential revisions before the deadline.

Your district is designed to be a community that you don't work or live in. It will likely take you some time to commute to your community district but you only need to do this once if you conduct the tour on the same day as the board meeting. You will be given a "free" class for the time it will take to visit your community.

1. Community Impressions (reflexive exercise):

In qualitative research, we often engage in reflexive exercises to understand how our own biases may impact our research. Reflexivity is "acknowledging the existence of researcher bias and explicitly locating the researcher within the research process" (Finlay). It emphasizes the importance of self-awareness and self-questioning. It is an ongoing process to understand "what I know and how I know it" (Patton). In this way, before you plan your walking tour of the community, write down your impressions of the community to which you have been assigned. Articulate how you think you developed these thoughts (press, movies, discussions, etc.) and how these impressions could impact your assessment of the community.

DUE DATE: 9/16
Length: 2-3 pages (not including references, tables or figures)

2. Community Tour
"Ethnographic" exercise

Take a walking tour of the community to which you have been assigned. In an expository description, state the day of the week and time of day you walked around the neighborhood and summarize your insights and feelings about walking around the

community. Were there any surprises? The description should answer questions such as:

General Observations of the community

1. What kinds of noises do you hear on the street? Where are the noises coming from?

2. Do the streets appear clean? At night, are there working streetlights on the streets?

3. What kind of transportation do people use? How accessible is the neighborhood? What kind of traffic is there?

4. How safe is the neighborhood? Explain your perceptions.

Population

1. Who are the people on the street? Describe their age, gender, race/ethnicity; what languages do you hear spoken? If people are hanging out in groups, note who they are with - - families, intergenerational groups, friends of the same age, race/ethnicity?

2. What are people doing? (Shopping/ "hanging out"/recreational activities) Are there local gathering spots for some people in the community such as parks, cafes, community centers?

3. What are people buying in the neighborhood supermarkets? Do community residents go to specific local restaurants or bars?

4. Does the population of the neighborhood change according to the time of day? Is there a large influx of people from outside the community during business hours (how do you know this)?

Institutions

1. What kind of commercial businesses are in the neighborhood? Are they "small" businesses or franchises?

2. What kind of religious institutions are there in the community?

3. What kind of government offices, schools, libraries, other city-run services exist in the neighborhood? Are the buildings clearly marked and what is the physical condition of the structures?

4. What kind of social service institutions or community groups exist? Are there youth service organizations, community centers, day care or senior centers?

5. What kinds of health services are available in the community? Drug stores? Private doctors offices? Hospitals? Community clinics? Drug treatment centers? Nursing homes? Others?

DUE DATE: 10/28
LENGTH: 2-3 pages (not including references, tables or figures)

3. Participant observation exercise

ATTENDANCE AT A COMMUNITY BOARD MEETING in the community to which you have been assigned is mandatory. Access to information about Community Boards can be found by going to the WebPages at *www.nyc.gov*. Meetings generally take place once a month. The following questions must be answered and please provide any additional comments about the Community Board Meeting.

1. Before you attend the meeting, write down your expectations. How many people will attend? What are the topics that will be addressed? What will the site be like? Compare these notes with your actual experience and describe this in your report.

2. Describe the process of finding out when and where the meeting will occur and any concerns or suggestions that you might have about the process. See if you can obtain the minutes of a previous meeting.

3. Note the make-up of the board and of the attendees. Do they reflect the overall makeup of the population? What are the topics on the agenda? What discussions occurred? How are decisions handled?

4. How effective is the mechanism of community boards in reaching out to and learning about community level concerns? Would you attend another meeting? Would you consider becoming more involved in the future? Explain why.

DUE DATE: 10/28 *(Note: if you are not able to attend a board meeting until after this date, please notify the instructor. You will be given 7 days from the date of the board meeting attended to submit the paper without penalty.)*
LENGTH: 2-3 pages (not including references, tables or figures)

4. Community Maps:
This is a creative exercise to construct a community needs assessment and assets map for your assigned community. Draw/create **1 or 2** community map(s). One that represents a needs-based approached and one that represents an assets-based approach, or you can make one map that combines both. Use the lecture and reading

for examples and as guide for your maps. Your maps should focus on the needs/assets of the community as a whole.

Some suggestions for the maps:
Needs Based Map
- What are the problems facing the community?
- What are the basic needs that are lacking in the community?
- Represents the barriers that people face in that community in order to lead a healthy life
- Orient whoever is looking at the map to the deficits that exist in the community and depending on the strategy used exactly where these deficits are located
Assets Based Map
- What are the assets present in the community?
- How can aspects of the community that may represent a barrier be looked at as an asset?
- What are the other non-economic or physical resources present in the community that can be used to improve health and the condition of the community?
- Are these assets wide-spread or located in particular areas?

In the end be creative, this is an exercise in presenting information in a different format. Think about how you would present this to members of the community you were assigned.

Include a list of references (but no formal write-up is required). Examples will be shown. You will briefly (1-2 min.) present your "map" to the class on the due date. See instructions posted on BlackBoard.

DUE DATE: 12/2

5. <u>Quizzes</u>
There will be two quizzes, one for each of the other online classes **(10/21 & 11/25)** that will cover the readings and lecture slides for each class, respectively. Quizzes are to be completed independently. (Note for each of these online classes you will also need to participate in the Discussion Forum. See description in "Attendance & Participation" section below.)

6. <u>Community Profile Paper:</u>
The major course assignment will be a two -part community profile project. Part I & II are both group projects. Each student has been assigned a Community District for this semester-long project. Throughout the semester, time will be allotted during class for you to meet with your fellow classmates who are assigned to your same Community District. All citations and the bibliography must be in AJPH format. The *New York City Department of Health Summary of Vital Statistics* must be included in your reference list.

The community profile is a written description of the community. Listings of data or presentation/copying of books/reports without written description are unacceptable. Included in the report **MUST** be:

PART I:

a. **Description of the history and physical environment** of the community (who founded the community and when, what is it like today, physical boundaries, names and roles of major institutions in the formation of the neighborhood, historical landmarks, types of housing stock (including rental vs. ownership), types of transportation including names and routes, etc.)

b. **Demographic profile** of the community (race/ethnicity, sex ratio, percentages and numbers of persons in all age categories listed by groups of 5 and younger and then in ten year integers up until 85+.) Note- you do NOT need to present the breakdowns of race/ethnicity and gender by each age category. The table should reflect the % and raw numbers by the following three variables: age (listed by groups of 5 and younger and then in ten year integers up until 85+), gender and race/ethnicity. One way to organize it is in the left hand column of your table to list each of these categories, with the other columns showing their respective % and raw numbers. You can also present these separately in different tables, pie charts, graphs, etc.

c. **Social and economic profile** of the community (religious affiliations, social successes and problems, environmental successes and problems, political affiliations and numbers of voters, types of employment, and numbers of employees and those on public assistance).

d. **Epidemiologic profile** of the community: including a description of the health status of your community, a comparison of rates for the five major causes of death in your community, rates for the five major causes of death in New York City and rates for the five major causes of death in the United States (A possible listing of fifteen major causes of death). Chart format will be provided on BlackBoard. You can use either the age-adjusted rate or the non-adjusted rate for this table. (Age-adjusted is preferable, if available.) Whichever you use, though, be sure that is consistent across your district, NYC and the US- and cited. There must be a written discussion/comparison of data across these three levels.

e. **Analysis** of the economic, social and health trends of your community. Identify existing organizational resources (name and type of organizations, scope of services provided, etc.) that help address the needs of the community. Indicate gaps in services.

DUE DATE: 11/11 (One (1) paper per group)
LENGTH: 6-8 pages (not including references, tables or figures)

PART II

a. **Selection of Primary Health Concern**: Describe five current or potential major public health concerns in your community. Select one **concern** (it must be listed in *Healthy People 2020)* that your group will address in this paper. This concern does not have to be a major cause of death, but what you define as a major public health problem based on your community research. This condition/disease may be one for which there are primary, secondary or tertiary prevention intervention strategies. Describe and justify your choice of a major public health problem in your community. If you are selecting drug use, please choose a specific drug such as alcohol, heroin, etc.
b. **Review the literature** on your selected public health problem. Define and discuss a) what is it, including its physiologic manifestations? b) What causes it? c) Can it be prevented? d)Who gets it? and e) What are the treatments?
c. **Review at least two intervention studies on your health condition.** Give a rationale for the articles your group selected. Be sure to remark on programs, goals and objectives, study population, duration of study, involvement of community, funding, findings and limitations.
d. **For your community, write at least two program objectives:** What are the best ways to approach going about reducing the burden of the condition you have chosen, given all that you know about the area and population that lives in that area? Include a brief overview of the proposed program/intervention your group has developed and list at least two detailed program objectives.

DUE DATE: 12/16 (One (1) paper per group)
LENGTH: 6-8 pgs (not including references, tables or figures)

7. Oral Presentations:

During the last 2 sessions of class, each group will present a summary of their assigned community as if they were presenting to their assigned community board. The presentation should highlight 1) a description of what was learned about the community; 2) key health data and health concerns identified; 3) description of the sources used to find your data and how the community board can take advantage of these resources such as the environmental tracking portal; 4) community assets/resources; 5) the major health concern that you think the community board health subcommittee should focus on and recommendations for how and what they should do reduce the burden of the health concern. Please review the instructions posted on BlackBoard for the oral presentation. Each group member will have 5 minutes to present. You will need to submit your slides by 3pm on the day of the presentation via BlackBoard. Use of powerpoint slides submitted later will result in a penalty, in fairness to other students. You will present as a group but receive individual grades.

12/9 or 12/16 (your group will sign up for a time slot earlier in the semester)

8. Group Member Evaluation: 5% of your final grade will be an average of your peer evaluations for your group work. The group member evaluation form is posted on BlackBoard. If you do not submit a group member evaluation form your group members will all receive the highest score as a default and your own grade will be deducted by 1 point.

DUE: 12/17

Grading

Evaluation criteria

The relative weight of each course component is as follows:

Assessment	Weight
Regular class attendance	5%
Class participation	10%
Quizzes (2 quizzes, 5% each)	10%
Community Impressions	10%
Community Tour	5%
Community Board Meeting	5%
Community Maps	10%
Community Profile Part I (group)	15%
Community Profile Part II (group)	15%
Oral Presentation (group)	10%
Group member evaluation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Your attendance grade reflects the number of in-class sessions you attend fully and on time. Excessive lateness and absences will be noted and reflected in your final grade. Class will start promptly at 4:10pm in order to maximize our time together. If you are going to be late or going to miss a session, please inform the instructor via email *prior* to the class. It is your responsibility to obtain the content and assignments for those sessions you miss (network with your classmates). If you miss *more than two* classes you risk receiving a failing grade for this course. Please initiate a meeting with the instructor if you miss three or more courses.

Participation in class discussion and Blackboard (when assigned) is vital in this course. Your participation grade will reflect consistent, thoughtful contributions to class discussions. Your participation should reflect your reading and understanding or questions related to the assigned reading. For the in-class sessions, it's impossible to participate unless you are in attendance. Two classes will be held online this semester in order to facilitate student work schedules. For the online sessions, participation will be graded based on your contribution of at least one response to the discussion

question posted by the instructor AND at least one response to another student's comments (comments due by the following Tuesday at 4:10pm - see schedule below).

Late/incomplete submission of assignments

All work is expected to be presented on time. 5% will be deducted for each day a written assignment is late. **After one week of lateness you will not receive any credit for that assignment.** In case of extenuating circumstances, please contact me. Please note the following specifications for all assignments: Papers and other assignments are due at the beginning of the class period (4:10pm) via BlackBoard unless otherwise noted. Any assignment submitted at or after 4:11pm will be considered late. If you anticipate the need to turn in work late, please negotiate with me a mutually acceptable submission plan in advance of the established due date. **DO NOT SEND AN E-MAIL REQUESTING AN EXTENSION ON THE DAY THE ASSIGNMENT IS DUE.** Papers and reports should be kept to the maximum length specified. I will stop reading after the maximum length and you will be marked down, accordingly. It is expected that your writing will be of graduate-level quality, presented in a readable and consistent manner: Times New Roman 12 pt font, double-spaced, typewritten, with one inch margins all around and proof-read. All written assignments should use the American Journal of Public Health reference format (this journal uses AMA style format).

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites or extra credit offered for this course.

Expectations of students

All students must enroll in BlackBoard. BlackBoard will be used on a routine basis as a learning tool to distribute course materials, as well as to facilitate communication with the instructor and classmates. You are expected to check your Hunter email daily for course updates.

The classroom is a community. Respectful interaction with classmates, the instructor and guests is expected at all times. Public health deals with controversial issues from multiple perspectives and consideration of these issues may cause disagreements among us or may evoke strong personal feelings, depending on our individual experiences, histories, identities and worldviews. Therefore, in all of interactions and communications, it is important that students strive to demonstrate mutual respect for one another and for any course guests and members of the community with whom they come into contact.

Please avoid crosstalk, text messaging, and turn off (or set to vibrate) cell phones etc., anything that can be distracting and take away from a climate of mutual learning or attentive listening and participation. Student announcements of related events and opportunities of interest to students may be made at the end of the class. Students should let the instructor know if they have an announcement to make. Feel free to

bring refreshments to class for yourself and/or others; but please help clean up afterwards.

Expectations for the instructor

Direct any inquiries to the instructor via e-mail. A response can be expected within 72 hours. Assignments will be graded within two weeks of the due date (unless otherwise stated). I will post lecture slides (if applicable) within 48 hours after our class.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857. If you have special accommodations that are necessary for class sessions, exams or presentations, please let me know at the beginning of the semester.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Help with research and writing: Feedback will be given on the quality of all written assignments. If you require further assistance with improving your writing skills, consider visiting the Student Reading and Writing Center on the main campus. For more information, visit http://rwc.hunter.cuny.edu/ .

Course Schedule

The schedule and assigned readings are subject to change throughout the semester. The "Last Updated" Date in the header references the current version of the syllabus and will be updated if a change in schedule is made. Please refer to the Hunter Academic Calendar for important dates including holidays, course meeting dates and withdrawals.

Session Date	Topic/Assignments	Readings
Session 1: 9/2	Introductions and Overview Definitions of community & health	Larson, Jewkes 1996
Session 2: 9/9	Community health assessment process overview	Hodges Ch. 1, Jewkes 1998, Sharma, Finlay, Gandelman Recommended: Bronx Community Needs Assessment
Session 3: 9/16	Theories of Health Promotion & Education; Conceptual models ***Guest Lecturer: Mia Brezin, CB11 E. Harlem*** **Due: Community Impressions Assignment**	Community Board 11 Statement of Need; Hodges Ch. 6, Earp, Morgan, Dunn
Hunter College Closed: No Classes 09/23		
Session 4: 9/30	Planning tools for CHA: Precede-Proceed Model	Castellanos, Buta, Hale, Hodges Ch. 2
Session 5: 10/07	Engaging Communities: CBPR Orientation, "insider" vs. "outsider" perspectives & power dynamics	Israel Ch. 5; Minkler, 2004; Minkler Ch. 1; Kerstetter; Carcari-Stone, Faridi
Session 6: 10/14	Data collection methods: overview, finding secondary data ***Guest Lecturer: John Pell, CUNY SPH Librarian***	Hodges Ch. 3, Finifter; Ulin Ch. 1 & 2
Session 7: 10/21 (ONLINE ONLY*)	**ONLINE: *Data collection methods: participant observation, "windshield tours"***	Hirsch, Israel Ch. 6, Ulin Ch. 5, Emerson

	Quiz #1 (online) **Due: Discussion Board comments (10/27)**	
Session 8: 10/28	Data collection: content analysis & document review **Due: Community Tour & Board Mtg. written assignments**	Borzekowski, Hsieh, Hussain, Latimer
Session 9: 11/4	**GROUP WORK – NO CLASS**	
Session 10: 11/11	Case Study: St. Vincent's Medical Center Closure ***Guest Lecturer: Diana Romero, PhD*** **Due: Community Profile Part I**	Romero (2012) & Romero (2012) – 2 readings
Session 11: 11/18	Data collection: Interviewing techniques	Ritchie Ch. 7; UCLA Section4; Van der Wees
Session 12: 11/25 (ONLINE ONLY*)	**ONLINE: *Identifying & Employing Community Assets*** **Quiz #2 (online)** **Due: Discussion Board comments (12/1)**	Kretzman; Sharpe
Session 13: 12/2	Program Planning & implementation; Logic models **Due: Community Map**	Hodges Ch. 4 & 9; Kellog Ch 1 & 2, McAlister
Session 14: 12/9	Oral Presentations	No reading
Session 15: 12/16	Oral Presentations/Wrap-Up **Due: Community Profile Part II**	No reading

*indicates class will meet online. You should NOT come into class on those days.

READINGS
Required text:

Hodges, Bonnie C & Videto Donna M. Assessment and Planning in Health Programs. 2nd edition. Jones & Bartlett. 2011.

Other required readings:

Borzekowski DLG, Schenk S, Wilson JL, Peebles R. e-Ana and e-Mia: A Content Analysis of Pro-Eating Disorder Web Sites. *American Journal of Public Health.* 2010;100(8):1526-1534.

Buta B, Brewer L, Hamlin DL, Palmer MW, Bowie J & Gielen A. (2011) An innovative faith-based healthy eating program: from class assignment to real-world application of PRECEDE/PROCEED. *Health Promotion Practice*. 12 (6): 867-875.

Cacari-Stone L et al. The Promise of Community-Based Participatory Research for Health Equity: A Conceptual Model for Bridging Evidence With Policy. American Journal of Public Health. 2014. Published online ahead of print July 17, 2014: e1–e9

Castellanos DC, Downey L, Graham-Kresge S, Yadrick K, Zoellner J, Cornell CL. Examining the Diet of Post-Migrant Hispanic Males Using the Precede-Proceed Model: Predisposing, Reinforcing and Enabling Dietary Factors. *Journal of Nutrition Education and Behavior*. 2013; 45(2): 109-118.

Community Board 11 Statement of District Needs, Fiscal Year 2016. Draft.

Dunn RL, Kalich KA, Henning MJ, Fedrizzi R. Engaging field-based professionals in a qualitative assessment of barriers and positive contributors to breastfeeding using the social ecological model. *Maternal and Child Health*. 2015; 19(1): 6-16.

Earp JA, Ennett ST. Conceptual models for health education research and practice. Health Education Research. 1991; 6: 163-17

Emerson RM, Fretz RI & Shaw LL, Writing Ethnographic Fieldnotes. Chicago: University of Chicago Press, 1995: Ch. 1 Fieldnotes in Ethnographic Research (pgs 1-16)

Eng E, Strazza K, Rhodes SC, Griffith D, Shirah K, Mebane E. Insiders and outsiders assess who is “the community”: Participant observation, key informant interview, focus group interview, and community forum, Ch 5. In: **Israel** BA, Eng E, Schulz AJ, Parker EA, eds. *Methods for Community-Based Participatory Research for Health,* 2nd ed. San Francisco, CA: Jossey-Bass; 2013: 133-159.

Faridi Z, Grunbaum JA, Gray BS, Franks A, Simoes E. Community-based participatory research: necessary next steps. *Prev Chronic Dis* [serial online] 2007 Jul

Finifter, D.H., Jensen, C.J., Wilson, C.E., & Koenig, B.L. (2005). A comprehensive, multitiered, targeted needs assessment model. *Family & Community Health, 28*(4), 293-306.

Finlay L. "Outing" the Researcher: The Provenance, Process, and Practice of Reflexivity. *Qualitative Health Research.* 2002;12(4):531-545.

Gandelman, A, DeSantis, LM, Rietmeijer, CA. Assessing Community Needs and Agency Capacity- An Integral Part of Implementing Effective Evidence-Based Interventions. *AIDS Education and Prevention*. 2006; 18A, 32-43.

Hale, J (1998). Application of the Precede-Proceed Model for Comprehensive Community Assessment, Education Programming, and Evaluation in a Combat Hospital Community during the Gulf War. *Home Health Care Management Practice* 11 (1): 52-65.

Hirsch JS, Higgins J, Bentley ME, Nathanson CA. The social constructions of sexuality: marital infidelity and sexually transmitted disease-HIV risk in a Mexican migrant community. *American Journal of Public Health.* 2002;92(8):1227-1237.

Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qualitative Health Research*. 2005. 15(9): 1277-88.

Hussain H, Omer SB, Manganello JA, Kromm EE, Carter TC, Kan L, et al. Immunization Safety in US Print Media, 1995-2005. *Pediatrics.* 2011;127:S100-S106.

Jewkes R, Murcott A. Meanings of community. *Soc Sci Med.* 1996; 43, 4: 555-563

Jewkes R, Murcott A. Community representatives: Representing the “Community”. *Soc. Sci. Med. 46(7): 843-858, 1998*

Kellog Foundation. *Logic Model Development Guide*. Battle Creek, MI: W.K. Kellogg Foundation; 2004

Kerstetter, K (2012). Insider, outsider, or somewhere in between: The impact of researchers’ identities on the community-based research process. *Journal of Rural Social Sciences*, 27(2), 99-117.

Kretzman JP and McKnight, JL, (1993). Building Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community's Assets, Evanston, IL: Institute for Policy Research pp. 1-11.

Larson, JS. The conceptualization of health. *Medical Care Research and Review*. 1999: 56, 2: 123-136

Latimer AE, Green KE, Schmid K, Tomasone J, Abrams S, Cummings KM, et al. The identification of framed messages in the New York State Smokers' Quitline materials. *Health Education Research.* 2010;25(1):54-60.

McAlister A, Puska P, Salonen J, Tuomilehto J, Koskela K. Theory and Action for Health Promotion: Illustrations from the North Karelia Project. *American Journal of Public Health.* 1982;71(1): 43-50.

Minkler, M. (2004) Ethical Challenges for the "Outside" Researcher in Community-Based Participatory Research. *Health Education & Behavior*. 31 (6): 684-697.

Minkler M, Wallerstein N, Introduction to community-based participatory research: New issues and emphases. In: Minkler M, Wallerstein N, eds. *Community-based participatory research for health: From process to outcomes*. 2nd ed. San Francisco, CA: Jossey-Bass; 2008: 5-23.

Morgan, PJ et al. The SHED-IT community trial study protocol: a randomised controlled trial of weight loss programs for overweight and obese men. *BMC Public Health*. 2010; 10: 701.

Ritchie J, Lewis J. *Qualitative Research Practice: A Guide for Social Science Students and Researchers. Chapter 7: In-depth interviews.* London; Thousand Oaks, CA: Sage; 2003.

Romero D, Kwan A, Swearingen J, Nestler S, Cohen N. (2012) Impact of the closure of a large urban medical center: a qualitative assessment (part I). *J Community Health.* Oct;37(5):982-94.

Romero D, Kwan A, Nestler S, Cohen N. (2012) Impact of the closure of a large urban medical center: a quantitative assessment (part II). *J Community Health.* Oct;37(5):995-1005.

Schensul JJ, Berg MJ, Nair S, Using ethnography in participatory community assessment, Ch 6. In: **Israel** BA, Eng E, Schulz AJ, Parker EA, eds. *Methods for Community-Based Participatory Research for Health,* 2nd ed. San Francisco, CA: Jossey-Bass; 2013: 162-188.

Sharma RK. *Putting the community back in community health assessment*: A process and outcome approach with a review of some major issues for public health professionals. *Journal of Health and Social Policy* 2003; 16, 3: 19-33

Sharpe PA, Greaney ML, Lee PR, Royce SW. (2000) Assets-oriented community assessment. Public Health Rep.Mar-Jun;115(2-3):205-11.

UCLA Center for Health Policy Research. Section 4: Key Informant Interviews.

Ulin P, Robinson ET, Tolley EE. Qualitative Methods in Public Health: A Field Guide for Applied Research. Jossey-Bass (2007).

Van der Wees PJ et al. Comparing the implementation of team approaches for improving diabetes care in community health centers. BMC Health Serv Res. 2014 Dec 3;14:608.

Other Resources:

Helpful Websites—Assessment and Planning

Community Toolbox, Bringing Solutions to Light http://ctb.ku.edu/en/. A helpful collection of resources for community health assessment and health program planning.

National Association of County & City Health Officers, Community Environmental Health Assessment (PACE EH)
http://www.naccho.org/topics/environmental/landuseplanning/index.cfm
A model for conducting community environmental health assessment at the local level.

National Association of County & City Health Officers, http://www.naccho.org/toolbox/. A collection of tools and resources for local public health practice.

National Association of County & City Health Officers
http://www.naccho.org/topics/infrastructure/MAPP/index.cfm. A community driven model for health planning in local public health.

The Asset Based Community Development Institute. http://www.abcdinstitute.org/. Resources and tools for asset based community planning.

Community and Public Health Data

U.S. Census Bureau. http://www.census.gov/ National, state and local data on populations, housing and economic indicators.

Centers for Disease Control, Behavioral Risk Factor Surveillance System.
http://www.cdc.gov/brfss/ national and state level data on behavioral risk factors.

New York City Health Department, Data and Statistics.
http://www.nyc.gov/html/doh/html/data/data.shtml, Health related data for New York City, including an interactive feature.

New York State Department of Health, Data and Statistics.
http://www.health.state.ny.us/statistics/ Health related data for New York State.

New York State, Community Health Assessment Clearinghouse.
http://www.health.state.ny.us/statistics/chac/ Resources for community health assessment in New York State.

Community Asset and Assessment Mapping

Asset-Based Community Development Institute
http://www.abcdinstitute.org/

Mapping Community Capacity by John McKnight & John Kretzmann
www.racialequitytools.org/resourcefiles/mcknight.pdf

Vitalizing Community: Building on Assets and Mobilizing for Collective Action by John Allen, Sam Cordes, Jeff Hart
Step-by-step guide to preparing for and hosting an asset mapping effort
www.nlc.state.ne.us/epubs/U2031/H003-2004.pdf

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College

COMHE 75100.02 "Community Health Interventions"

3 Credits
Fall, 2015

Time and Location	Online and in-person: Silberman, Room 216, Tuesdays, 6:05-7:50pm
Instructor	Jessie Daniels, PhD, Professor | Email: jdaniels@hunter.cuny.edu , Twitter: @JessieNYC
Office hours	Tuesdays, 4-6pm & by appt.
Course website	https://canvas.instructure.com/courses/867603
Support resources	Twitter, course hashtag: #CMHE751 | We will share relevant info about the course here
Course description	An introduction to community-level interventions as explained by theories of individual, organizational and community change from the disciplines of psychology, sociology and health education.
Course prerequisites	PH 75500, COMHE 75000
Course format	Hybrid, a mix of online and in-person: 9/1, 10/13, 11/10, 12/15
Required reading and resources	*Health Education: Critical Perspectives*, Katie Fitzpatrick, Richard Tinning, Editors, (Routledge, 2014). (*Two copies of this book are on reserve at the Silberman Campus Library.)
Suggested reading and resources	Additional open access, peer-reviewed articles and documentary films will be required and made available on the course site.

Learning Objectives:

This course is intended to prepare students to think critically about the theory, design, and implementation of community health interventions in urban settings. As such, the course prepares students to: 1) understand theories from psychology, sociology and health education meant to improve the public's health; 2) critically analyze public health intervention projects; 3) write and present clearly about community health concerns; 4) design multi-level, theory-driven interventions that support community health goals, particular in multiethnic, urban populations; and, 5) present research findings (individual) and proposed intervention (group) to the class.

Program Competencies Addressed in this Course

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to achieve the following competencies which are expected of MPH graduates in your specialization track:	*After successfully completing this course you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Identify theories from psychology, sociology and health education that apply to behavior change and maintenance.	1. Understand theories from psychology, sociology and health education meant to improve the public's health	Assements 1-6
2. Conduct literature reviews and Internet searches on selected health issues and interventions.	2. Critically analyze public health interventions.	Assements 3,6,9,10-13
3. Apply principles of effective communication, by using various media and formats, applied to different audiences and communities.	3. Write clearly about community health concerns.	Assements 3,6,9
4. Develop theory-driven health education programs.	4. Design multi-level, theory-driven interventions that support community health goals, particular in multiethnic, urban populations.	Assements 9, 10, 11
5. Involve communities in the design of appropriate intervention strategies.	4. Design multi-level, theory-driven interventions that support community health goals, particular in multiethnic, urban populations.	Assements 9, 10, 11
6. Develop, produce and evaluate media campaigns to create health consciousness.	5. Present research findings (individual) and proposed intervention (group) to the class.	Assements 8, 14,15
7. Develop and/or incorporate culturally sensitive and age appropriate health education materials.	5. Present research findings (individual) and proposed intervention (group) to the class.	Assements 8, 14,15

Course Assessments

Your understanding of the course material will be evaluated though class participation and discussions, several individual writing assignments, oral presentations (both individual and group), and through group work.

1. In-Person Class Attendance (5%). This class will meet four (4) times in person. Each student is required to attend all in-person class meetings.
2. Online Class Participation (15%). This class will meet throughout the semester online. Each student is required to participate online in the course several times a week, through the course management site (Canvas), through Twitter, and through Google Hangouts/Air. Each student, either individually or in pairs, will be tasked with scheduling and leading at least one Google Hangout/Air for other students during the semester. These sessions will happen most every week at a time chosen by the students leading them. Assessment on this component is subjective and up to the instructor's discretion, but in general terms is an evaluation of a student's active participation in the online components of the course.
3. Individual Written Assignments (30%). A large portion of any public health professional's working life is accomplished through clear, effective written communication. These assignments are intended to develop the ability to write about community health effectively and clearly.

- **Written Assignment 1: Community & Health Condition of Concern (10%).** Briefly describe the community you are interested in, be sure to include demographics and evidence of negative health outcomes, along with strengths and assets of the community. Identify at least three current public health concerns in your community, select one concern to address in this paper, and justify your choice. Review the literature on your selected public health problem, and be sure to detail the proximate, distal and fundamental causes. Present data on the incidence and prevalence in the community and in New York City as a whole. Are there specific populations within your community that are particularly vulnerable to this condition? Who are they and why are they susceptible? **5 pages, double-spaced, 1250 words. Due: September 14.**
- **Writing Assignment 2: Successful & Failed Interventions (10%).** Review five (5) intervention studies on your health condition. Identify at least one intervention that in your view "failed", in other words, note the ways that the interventions described did not reduce the burden of the health condition on the intended community. In light of your research, write four or more program objectives that encapsulate your view of the best ways to reduce the burden of the condition you have chosen in your community. **5 pages, double-spaced, 1250 words. Due: October 5.**
- **Writing Assignment 3: Theory-Driven Proposal for a Structural Intervention (10%).** Drawing on the assigned readings and the literature reviewed in your previous two writing assignments, propose a theory-driven rationale for a structural intervention to reduce the burden of the condition you have chosen in your community. **5 pages, double-spaced, 1250 words. Due: October 26.**

4. Group Work: Design a Multi-Level Community Health Intervention (25%). In the field of community health, interventions are almost always designed by groups of people working in collaboration with one another. This assignment is intended to simulate that experience. Class sessions will be designated in which students can work together in their groups. This group work may be done online or in-person, mostly at the students' discretion (some of this group work will be done during in-person sessions at the instructor's direction). Working in groups, students will design a multi-level community health intervention, including a theory-driven logic model. To help you progress along the way to the final project, the logic model will be required earlier (**due: November 25**). Students will present this work in written form and in oral presentation. **10 pages, double-spaced, 2400 words. Due: December 15, at the time of scheduled oral presentation.**

5. Oral Presentations (10%). Professionals working in the field of public health are often required to give oral presentations of their ideas, proposals, and projects. This assignment is intended to develop the necessary skills to do that well.

- **Individual Presentation (online - 5%).** Using VoiceThread (www.voicethread.com - free but requires registration), each student will prepare a brief (no more than 5 minutes) oral presentation. This presentation will be image-driven, with audio content based on Writing Assignment #2.
- **Group Presentation (in-person - 5%).** The culminating course assignment is a presentation that you will give with your group. Throughout the semester, time will be allotted during class for you to meet with in these groups. During the last two class sessions, each group will present an overview of their multi-level intervention and field questions from their peers about the proposed intervention. This presentation will be image-driven and no longer than 15 minutes.

Hybrid Course: Please note that this course is a hybrid course, meaning there will be a mix of online and in-person class sessions. There will be four (4) required in-person sessions and the rest of the course will happen online, in both synchronous and asynchronous sessions.

The required in-person meeting dates will be: **9/1, 10/13, 11/10, and 12/15**. These in-person meetings are required. If you do not attend, you will lose points toward your final grade. Students in the class may choose to meet more often in-person or online. We will meet in Room 216, at the Silberman Campus of Hunter College.

For the uninitiated, hybrid courses may seem easier (only 4 sessions! woo-hoo!). This is a mistake. If anything, hybrid courses are *more difficult* than traditional face-to-face classes because they require students to be more self-directed in their learning.

As with many online learning environments, the model here is "peer-to-peer" learning rather than "sage on the stage." In other words, the goal is that you will learn from each other as much or more than from the professor. Again, if this is a new way of learning, this may prove challenging at first, but ultimately is more rewarding and accrues greater long-term benefits.

Grading (relative weight of each component):

Class attendance (in-person)	5%
Class participation (online and in-person)	15%
Individual written assignments (online)	45%
Group Work (in-person; written & oral)	25%
Oral presentations (online and in-person)	10%
	100%

The grading scale for the course follows that in the Hunter Catalog:

Letter Grade	Quality Points	%
A+	4.0	97.5-100
A	4.0	92.5 - 97.4

A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C-	2.0	70.0 - 77.4
F	0	<70

Withdrawal: If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Last day to drop the course with the grade of "W": Monday, November 9.

Grade of incomplete: Incompletes are not recommended. Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade Appeals: When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance/Class Participation: This class will meet four (4) times in person. Each student is required to attend all in-person class meetings. This class will also meet throughout the semester online. Each student is required to participate online in the course several times a week, through the course management site (Canvas), through Twitter, and through Google Hangouts/Air. Each student, either

individually or in pairs, will be tasked with scheduling and leading at least one Google Hangout/Air for other students during the semester. These sessions will happen most every week at a time chosen by the students leading them. Assessment on this component is subjective and up to the instructor's discretion, but in general terms is an evaluation of a student's active participation in the online components of the course.

Late/Incomplete Submission of Assignments: Students should strive to submit assignments on the dates and times they are scheduled. In the event that this is not possible, late assignments will be accepted.

Make-ups, rewrites and extra credit: The goal of this MPH course is "mastery" over some difficult concepts. If students would like to rewrite an assignment because they believe it will help them develop mastery, then they will be given this opportunity. There will be no make-up or extra credit assignments.

Expectation of students:

- add a photo and some text to complete your profile on the course site;
- attend in-person class sessions;
- participate online (lead a Google Hangout, share information on the course hashtag via Twitter);
- connect with other people in the class (your peers are your 'co-learners' and you will help each other);
- manage your time well (the course goes very quickly, and it's easy to fall behind);
- check into the course site often (part of how you'll manage your time and keep up);
- do the readings, watch the videos, think critically;
- turn in assignments when they're due;
- don't get behind and don't get discouraged;
- have fun!

Expectations for the instructor:

- help students navigate instructional technology used in the class (course site, Google Hangouts, Twitter);
- set readings, videos and assignments for the entire course;
- evaluate and provide feedback on students mastery of course material;
- lead in-person class sessions;
- guide students in leadership skills to lead discussion sections.

Hunter College Institutional Policies
(http://www.hunter.cuny.edu/provost/reports-policies/policies)

Accessibility: "In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call: (212) 772- 4857 or (212) 650-3230."

Academic integrity: "Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures."

Help with research and writing: "Students must demonstrate consistently satisfactory written English in coursework. The Hunter College Writing Center provides tutoring to students across the curriculum and at all academic levels. For more information, see http://www.hunter.cuny.edu. In addition, the Teacher Placement Office in the School of Education offers a writing workshop during the semester and a series of free writing classes are offered to students who are in need of additional support in improving their writing skills. In both cases, stop by room I000 West for information and dates of workshops."

Course Schedule

Session	Format	Date	Topic	Readings & Assignments
1.	In-person	Sept 1	Introduction to Interventions & Group Selections	
2.	In-person	Sept 8	Colonialism, Healthism & Public Health & Group Work	Part 1. Fitzpatrick & Tinning
3.	Online	Sept 15	Inventing Health Issues	Part 2. Fitzpatrick & Tinning
Writing Assignment #1 Due. (online)				
4.	Online	Sept 22	Structure, Theory & the Limits of Individual Behavior Change	Additional online readings
5.	Online	Sept 29	Power, Participation, and Engaging Communities	Additional online readings
6.	Online	Oct. 6	Policy Interventions	Additional online readings
Writing Assignment #2 Due. (online)				
7.	Online	Oct 13	Impact & Effectiveness	Additional online readings
8.	Online	Oct 20	Successful & Failed Interventions	Additional online readings
Individual Oral Presentations Due. (online)				
9.	In-Person	Oct 27	Designing Interventions & Group Work	Part 3. Fitzpatrick & Tinning
Writing Assignment #3 Due. (online)				
10.	Online	Nov 3	Communication, Dissemination & Collaborative Decision-Making	Additional online readings
11.	Online	Nov 10	Theory-Driven Logic Models	Additional online readings
12.	Varies	Nov 17	Group Work	---
13.	Varies	Nov 24	Group Work	---
Logic Models Due. (online)				
	No Class	Nov 26	Thanksgiving Holiday	
14.	In-Person	Dec 1,8	Group Work	---
15.	In-Person	Dec 15	**Group Papers & Oral Presentations Due.** (in-person)	---

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
COMHE 75400:Research and Evaluation for Community Health
3 Credits
Fall 2015

Time and location	Thursdays 6:05-7:50pm; Silberman 329
Instructor	Jocelyn Apicello, DrPH, Adjunct Instructor Best contact: japicell@hunter.cuny.edu
Office hours	Thurs 5-6pm and 8-9pm; or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Basic concepts, methods and approaches for evaluation research applied to community health education and health-related programs through a critical review of literature and a program evaluation design.
Course prerequisites	15 credits in program including PH 75000 or PH 75100, PH 75500, COMHE 75000, COMHE 75100, COMHE 75200
Course format	Seminar with in-class discussions and group work
Required reading and resources	Required book: Rossi PH, Lipsey MW, Freeman, HE. *Evaluation: A Systematic Approach*. 7th ed. Thousand Oaks (CA): Sage Publications; 2004. Additional required readings are indicated below in the course schedule and are posted on Blackboard when available.
Suggested reading and resources	Recommended book: Perrin, KM. *Principles of Evaluation and Research for Health Care Programs.* Burlington (MA): Jones & Bartlett Learning; 2015. Additional suggested readings are indicated in the course schedule and are posted on Blackboard when available.

Program Competencies	**Course Learning Objectives**	**Assessment Methods**
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply social and behavioral theory and evidence to assess, plan, implement and evaluate community health programs, policies and interventions that promote health equality and reduce inequities.	• Assess program theory based on evidence from the public health literature • Identify the role theory and logic models play in designing comprehensive impact evaluations • Use process measurement to differentiate between failures of theory and failures of implementation • Design processes to involve stakeholders in evaluation planning • Explain the relevance of program sponsors, decision makers, managers, users and community stakeholders to the evaluation process	• Quiz 1 and 2 • Classroom discussions • Measure development assignment • Qualitative interview guide assignment • Group evaluation plans
Use qualitative and quantitative research methods to generate insight into community health issues.	• Select a research design appropriate to the evaluation purpose, available resources, and situational concerns • Define and operationalize proximate and distal outcomes • Identify valid, reliable scales • Design and conduct stakeholder interviews	• Classroom discussions • Measure development assignment • Qualitative interview guide assignment • Group evaluation plans
Apply ethical, socially just, and culturally competent principles and strategies to community organizing, community health assessment, program planning, implementation and evaluation.	• Identify the criteria for human subjects' research • Articulate the purpose and function of the IRB process and be able to identify some of its historical context	• Quiz 1 • Informed consent assignment • CITI Social and Behavioral Training for Human Subjects • Group evaluation plans

Course Assessments

Quizzes:

Students are responsible for completing two (2) online quizzes during the semester. The quizzes will be posted on Blackboard one (1) week prior to being due. Quizzes are open book and are timed: once a student begins a quiz they will have a limited amount of time to complete it. Quiz answers must be posted via Blackboard. These are individual quizzes – collaboration with peers is not allowed. Quizzes are worth 20% of the student's final grade (10% each quiz).

Program evaluation plan:

The most appropriate method for acquiring evaluation skills is to work together with colleagues on an evaluation plan of a program. Throughout the entire semester students will work in small groups on the critical steps to developing a complete evaluation plan of a public health program. In the Spring 2015 semester of COMHE750 (Community Health Assessment), students were asked to develop a program proposal for a community in New York City. This semester, students will be assigned to groups with a former student of COMHE750 so you can make use of their proposed program.

That said, each student will complete several individual assignments and group assignments that culminate in a complete evaluation plan. Please see below for an explanation of these assignments. Also note: All assignments must be posted to Blackboard by the due date - no paper or email versions accepted.

Individual assignments:
1. Human subjects training: Complete the CITI Social and Behavioral Training for Human Subjects Research. Course available at: *www.citiprogram.org*. If you have previously completed the training and your report is still valid (i.e., within 2 years), you only have to submit your proof of completion (i.e., you do not have to take the course over again). This assignment is graded as Pass/Fail.

2. IRB consent form development: An important stage of conducting research with human subjects is to obtain informed consent. Students will be responsible for designing an informed consent form to conduct evaluation research of their group's program. Detailed instructions on how to complete this assignment are posted on Blackboard.

3. Measure development: A data collection instrument can only be as good as the measures within it. Based on your group's conceptual framework, select one concept and describe in 1-page maximum how you plan to measure the concept quantitatively. You must cite the literature and any reliability or validity data on the measure. Each group member must select a different concept to measure.

4. Qualitative interview guide: Qualitative interviewing requires a trained interviewer *and* a valid interview guide. Select two (2) concepts to explore qualitatively (one can be the same concept you developed a measure for in #3 above) and develop a brief (i.e., 1-page maximum) qualitative interview guide following the guidelines in the Hennick et al. reading.

Group assignments:
1. Defining the problem, description of the program and conceptual framework: Using the program from the Spring 2015 COMHE750 class, write a 2-page maximum paper that briefly covers background on the public health problem being addressed (with respect to the particular community being addressed);

identifies the objectives of the program; briefly describes the program; and develops a conceptual framework that shows how the program is expected to achieve the objectives (the conceptual framework does not count toward the 2-page limit).

2. Process evaluation plan: Your group will propose a process evaluation plan of the program. You will be responsible for defining purpose and objectives of the process evaluation; proposing one quantitative data collection methodology to achieve the objectives; and proposing one qualitative data collection methodology to achieve the objectives. Examples of your data collection instruments must be included. 4-page maximum (instruments do not count toward 4-page limit). More detailed instructions are posted on Blackboard.

3. Summative evaluation plan: Your group will propose a summative evaluation plan of the program. You will be responsible for defining purpose and objectives of the summative evaluation; identifying indicators for outputs, initial outcomes and intermediate outcomes; proposing a study design; identifying threats to validity; and discussing advantages and disadvantages of the methodology. 4-page maximum. More detailed instructions are posted on Blackboard.

4. Oral report on evaluation plan: Each group will report back to the class on their evaluation plans. These oral reports will simulate a briefing to the community board where your program and evaluation take place. Powerpoint is not expected, but is permissible. Groups will have 15 minutes to present the following: review of the public health problem; the program description; the conceptual framework; the process evaluation plan; and the summative evaluation plan. The last 2 sessions of the course are dedicated to these report backs.

Grading

Evaluation criteria

Quizzes are multiple choice and short answer and are assessed for accuracy. Written assignments are assessed based on content areas within each assignment, as laid out in this syllabus or in additional resources provided by the instructor that will be posted on Blackboard. Oral communication assignments are assessed based on the grading rubric posted on Blackboard.

The relative weight of each course component is as follows:

Assessment	Weight
Attendance/participation	15%
Quiz 1 and 2	20%
IRB consent form	5%
Measure development	5%
Qualitative interview guide	5%
Defining problem, program description and conceptual framework (group-based)	10%
Process evaluation plan (group-based)	15%
Summative evaluation plan (group-based)	15%
Presentation of evaluation plan (group-based)	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Students are expected to arrive to class on time, to be prepared for class, and to actively participate in class discussions and activities. Frequent absences, persistent lateness, failure to participate in class discussions/activities, or evidence of lack of preparation will result in a poor class participation grade (15%). If a student needs to miss a class, it should be communicated to the instructor in advance. Students who miss more than 2 classes may be required to submit written assignments to reflect their understanding of content discussed at the missed classes. Students are responsible for class content and assignments, even if they miss a class.

Late/incomplete submission of assignments

Assignments are due at the beginning of class on the date indicated in the syllabus; two points will be deducted for each day an assignment is late. If a student anticipates the need to turn in work late, please

negotiate an acceptable submission plan with the instructor at least *24 hours in advance* of the established due date. In case of emergencies, contact the instructor immediately.

Make-ups, rewrites, and extra credit

There is no extra credit in this course. Make-ups on assignments will be at the discretion of the instructor and, if instituted, will apply to all students in the class equally.

Expectations of students

The classroom is a community. It is important that everyone demonstrate mutual respect for one another and for any course guests or members of the larger community with whom they come into contact. Please turn off or silence cell phones when entering class and avoid text messaging, crosstalk, etc. Use of laptops is permitted but not encouraged. Classroom engagement and active participation is expected and when there is a screen open in front of a student there are more opportunities for disengagement or multi-tasking that could be reflected in the participation grade. We will strive to create an atmosphere of mutual learning, where inquiry, critical thinking, reflection, and discussion are welcome, even when they are uncomfortable. Students should be fully prepared to actively participate in discussion. Questions of clarification are appropriate, but it is *dis*respectful to classmates who have completed the reading to bog the discussion down with questions that reflect lack of preparation. Students are responsible for regularly checking the course website and Hunter email for course-related correspondence.

Expectations for the instructor

The instructor will provide regular announcements, reminders and suggestions on the course website. She will respond to student emails within 36 hours Monday through Friday. Grading and feedback of assignments will be completed within 2 weeks of the due date and returned electronically via Blackboard or email. Communication about grades and progress in the course will be given throughout the semester. The instructor will listen to all requests for grade changes or appeals and will take action if deemed appropriate and necessary. The instructor's teaching style is very discussion-oriented. Do not expect Powerpoint lectures. Critical thinking and articulation of the material during class discussions is the goal.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Please note: This schedule and assignments are subject to change. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. If students do not actively participate in class discussion, written weekly responses or in-class quizzes will be assigned.

Please refer to Hunter's current academic calendar for important dates: http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%20-Repaired-FINAL.pdf

	Date	Topic	Readings	Assignments & Due Dates
1	Aug 27	ONLINE CLASS: Evaluation and ethics. NOTE: This class session does NOT meet in-person. It is an on-line session.	• Harris, Ch 1, An introduction to public and community health evaluation, 1-18 • Perrin, Ch 2, Ethics, 29-51. • The Belmont Report, available at http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html	• Individual assignment #1 due: Human subjects training; due by 11:59 on Aug 28 (Fri) • "Meet" with your assigned group via discussion, text, email by 11:59 on Aug 28 (Fri)
2	Sept 3	Evaluation and research; Conceptual models	• Earp JA, Ennett ST. Conceptual models for health education research and practice. *Health Education Research, 1991*; 6: 163-77. • Rossi, Ch1; and from Ch 2, Tailoring evaluations, 52-61. • Perrin, Ch 1, Purpose, 1-28. • CDC Self Study Guide - ftp://ftp.cdc.gov/pub/Publications/mmwr/rr/rr4811.pdf	• Individual assignment #2 due: Informed consent form
---	Sept 10	NO CLASS	• Classes follow a Monday schedule	
3	Sept 17	Describing the program; Evaluability assessment	• Rossi, Ch 5, Expressing and assessing program theory, 133-168. • Harris, Ch 5, Designing the evaluation: describing the program, 79-86. • Parra-Medina D, Taylor D, Valois R, Rousseau M, Vincent M, Reinnger B. The Program Plan Index: an evaluation tool for assessing the quality of adolescent pregnancy prevention program plans. *Health Promot Pract.* 2003; 4(4): 375-84.	• Group assignment #1 due: Defining the problem, describing the program and conceptual model
4	Sept 24	Planning and focusing the evaluation;	• Holden and Zimmerman, Ch 2, Evaluation planning here and now, 7-32.	• Quiz 1 opens online (inclusive of Sept 24)

		Engaging stakeholders	• Rossi, from Ch 2, Tailoring evaluations, 31-52; Ch 3, Identifying issues and formulating questions, 77-100. • Liket KC, Rey-Garcia M, Maas KEH. Why aren't evaluations working and what to do about it: A framework for negotiating meaningful evaluation for nonprofits. *Am J Eval. 2014;* 35(2): 171-188.	
5	Oct 1	Measurement concepts	• Perrin, from Ch 5, Reliability and validity, 109-128. • Perrin, from Ch 7, Elements of research, 171-180. • Perrin, from Ch 8, Surveys, 212-218.	• Quiz 1 closes
6	Oct 8	Measurement concepts (cont'd)	• Perrin, from Ch 5, Reliability and validity, 128-135. • Perrin, from Ch 7, Elements of research, 180-188. • Conron KJ, Landers SJ, Reisner SL, Sell RL. Sex and gender in the US health surveillance system: a call to action. *Am J Public Health*. 2014; 104(6):970-976. • Additional reading TBA. *Recommended reading* • Chen HT. The bottom-up approach to integrative validity: a new perspective for program evaluation. *Eval Prog Plann.* 2010; 33: 205-214.	• Individual assignment #3 due: Measure development
7	Oct 15	Qualitative interviewing	• Hennick M, Hutter I, Bailey A. Ch 6, In-depth interviews. In *Qualitative research methods*. Thousand Oaks, CA: Sage; 2011, 109-132. • CDC focus group guide: http://www.cdc.gov/nccdphp/dnpa/socialmarketing/training/pdf/focusgroupguidelines.pdf • Perrin, from Ch 6, Qualitative data, 145-163. • Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups.	
8	Oct 22	Process evaluation	• Rossi, Ch 6, 169-201 • Mowbray CT, Holter MC, Teague GB, Bybe D. Fidelity criteria: development, measurement, and validation. *Am J Eval*. 2003; 24(3): 315-340. • Additional reading TBA.	• Individual assignment #4 due: Qualitative interview guide
9	Oct 29	Outcome, impact and efficiency evaluations	• Rossi, from Ch 7, Measuring and Monitoring Program Outcomes 203-231. • Rossi, from Ch 8, Assessing Program Impact, 233-238 • Rossi, Ch 11, Assessing Program Efficiency	• Group assignment #2 due: Process evaluation plan • Quiz 2 opens online (inclusive of Oct 29)

10	Nov 5	Outcome, impact and efficiency evaluations: Reading the literature	• Weitzman BC, Mijanovich T, Silver D, Brecher C. Finding the impact in a messy intervention: using an integrated design to evaluate a comprehensive citywide health initiative. *Am J Eval*. 2009; 30(4): 495-514. • Woods ER, Bhaumik U, Sommer SJ et al. Community asthma initiative: evaluation of a quality improvement program for comprehensive asthma care. *Pediatrics*. 2012; 129(3): 465-472.Somerset S, Markwell K. Impact of a school-based food garden on attitudes and identification skills regarding vegetables and fruit: a 12-month *intervention* trial. *Public Health Nutr*. 2009; 12(2): 214-221.	• Quiz 2 closes • In-class exercise: Identifying strengths and weaknesses in published studies
11	Nov 12	Experimental, non-experimental and quasi-experimental research design	• Rossi, from Ch 8, Randomized field experiments, 239-262. • Rossi, Ch 9, Assessing Program Impact, 265-300. • West, S.G. Duan, N., Pequegnat, W., et al. (2008). Alternatives to the randomized controlled trial. *American Journal of Public Health*, 98(8):1359–1366. • Additional reading TBA.	
12	Nov 19	Research designs: reading the literature	• Long JA, Jahnle EC, Richardson DM, Loewenstein G, Volpp KG. Peer mentoring and financial incentives to improve glucose control in African American veterans: a randomized trial. *Ann of Inter Med*. 2012; 156(6): 416-424. • Robitaille Y, Fournier M, Laforest S, Gauvin L, Filiatrault J, Corriveau H. Effect of a fall prevention program on balance maintenance using a quasi-experimental design in real-world settings. *J Aging Health*. 2012; 24(5): 827-845.	• Group assignment #3 due: Summative evaluation plan • In class exercise: identifying threats to validity
13	Dec 3	Analyzing program effects	• Rossi, Ch 10, Detecting, interpreting and analyzing program effects • Additional readings TBA.	• In class exercise: interpreting evaluation results
14	Dec 10	Evaluation plan reports	None	• Group assignment #4 due: Oral reports on evaluation plan (groups 1-5)
15	Dec 17	Evaluation plan reports	None	• Group assignment #4 due: Oral reports on evaluation plan (groups 6-10) • Group peer evaluations due by Dec 17, midnight

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
COMHE 77085: Qualitative Research Methods in Public Health
3 Credits
Fall 2015

Time and location	Silberman Building, Rm 318, Wednesday, 6:05-7:50pm
Instructor	Diana Romero, PhD, MA Associate Professor, Hunter College 2180 Third Ave, New York, NY 10035, Rm. 542 Office: 212-396-7743 diana.romero@hunter.cuny.edu (preferred contact)
Office Hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course provides students with a foundation in qualitative research methods, with a focus on their application to public health practice and research. It covers qualitative research design, data collection, analysis, writing for publication, and dissemination of findings. Students will develop a qualitative research project of interest or work on an instructor-assigned project, develop an appropriate study design, conduct primary data collection and analysis, and write a research report.
Course prerequisites	PH 750/751 and PH 752/753, or permission of instructor
Course format	Lecture format with active student participation
Required reading and resources	- Ritchie J, Lewis J, Nicholls CM, Ormston R. *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage; 2014. (ISBN: 978-1446209127) - Morgan DL. *Focus Groups as Qualitative Research*. 2nd ed. Thousand Oaks, CA: Sage; 1997. (ISBN: 978-0761903437) - Auerbach C, Silverstein LB. *Qualitative Data: An Introduction to Coding and Analysis*. New York: New York University Press; 2003. (ISBN: 978-0814706954) - Additional readings noted on the course Blackboard site
Suggested reading and resources	- Corbin JM, Strauss AL. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. 3rd ed. Los Angeles, CA: Sage; 2008. (*or* new 4th edition, 2014) - Miles MB, Huberman AM, Saldada J. *Qualitative Data Analysis: A Methods Sourcebook*. 3rd ed. Thousand Oaks, CA: Sage; 2013.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Understand basic theories, concepts, models and methods from a range of core and related disciplines and apply them to the design of PH research, policy and practice	• Describe the strengths and limitations of 4 different approaches to qualitative research (focus groups, in-depth interviews, observational methods, content/document analysis) • Discuss the concepts of reliability and validity and ways in which they are assessed in qualitative research	• Reflexive memo • Research proposal • Class attendance and participation
Design and evaluate interventions to prevent or control urban PH programs	• Design a study on a public health topic of interest that uses one of the qualitative methods described below	• Research proposal • Class attendance and participation
Use qualitative and quantitative research methods to generate insight into community health issues.	• Collect and/or analyze qualitative data produced from focus group, in-depth interview, ethnographic or a document-based study design	• Data collection instrument • Code book/data display/analytic memo • Final paper
Collect, analyze and interpret PH data	• Specify a central research focus that can appropriately be addressed using qualitative methods, and for which data can be collected, analyzed, and written up by the end of the semester	• Reflexive memo • Quant-Qual question exercise • Data collection instrument • Code book/data display/analytic memo • Class attendance and participation
Apply ethical and social justice principles and standards	• Demonstrate knowledge of the principles of the ethical conduct of research with human subjects • Carry out qualitative data collection according to the principles referred to above	• CITI certificate • Research proposal • Final paper • Class attendance and participation
Communicate PH	• Develop an original final report and	• Final presentation

information verbally and in writing	slide presentation of a qualitative research project and present it to the class and instructor	• Final paper • Class attendance and participation

Course Assessments and Grading

Students' understanding of the course material will be evaluated through a combination of in-class activities and participation, written assignments, and presentations described below. the relative weight for each assignment is noted below. Additional details about the assignments are posted on the course Blackboard site.

Grading	
Required (cannot do class research project without this)	CITI Certificate: The CITI is an online training program (www.citiprogram.org) that provides certification for human subjects research. Students must complete the Basic Module by the second class session and upload their certificate to the Bb folder. Please do not leave this until the "last minute" as the Basic Module requires approximately 3-4 hours to complete. (Note: it is divided into several sections that can be done at different times.)
5%	Reflexive Memo: A 1-2 page memo in which you reflect on how your social, economic, gender, educational and other positions/identities may influence, constrain, and shape your research question and how these understandings, assumptions, and points of reference may inform your work as you collect and analyze data for your research project.
10%	Quantitative-Qualitative Questions Exercise: Identification and critique of two close-ended questions
Hypothetical Grade (for feedback)	Central Research Focus and Methods Proposal (draft): A short (3-4 pp) proposal of the public health research topic you would like to investigate, the qualitative method you will use, and why it is best suited for this research project.
15%	Research Proposal: Revised proposal and with logistical details and timeline added.
10%	Data Collection Guide/Instrument
15%	Code book, data display, *or* analytic memo: Submit only 1 of 3 of these "steps" in the qualitative analysis process. (Depends on where the student is in the process.)
10%	Final PowerPoint Presentation: In-class presentation of project (data collection, analysis, and results).
25%	Final Paper: A complete write-up of the research question, methods, and results of the final project.
10%	Class Attendance and Participation: This pertains to an expectation of perfect attendance and *active class participation*.
100%	

Assignments are to be submitted in class on the day that they are due, unless the instructor has set up a folder on Blackboard where the assignment can be submitted *before* the start of class.

Final grades are based on the sum of assignment scores as described above. There will be no opportunity to do additional work for extra credit.

Guidelines for Written Assignments: All papers should be typed, double-spaced, spell-checked and proofread. Please use 1-inch margins all around and 11- or 12-point font. For identification purposes, please include your name, title of the assignment, course, term, and date. Print copies should be submitted for all assignments unless otherwise instructed. Use only AMA style for citing references. You may consult this link at guidelines on how to cite using the AMA style: http://www.lib.jmu.edu/citation/amaguide.pdf.

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
Students are expected to attend *every* class session and complete the readings *prior to* each of the class sessions so as to be able to participate fully during the class. Students should also be prepared to be selected at random to lead class discussions on assigned readings and other course materials. The instructor should be notified in person or by email if an absence is unavoidable; excessive lateness may be considered equivalent to absence from class. It is the student's responsibility to obtain missed class notes and related information from a colleague. Assignments must be received by the due dates regardless of class attendance.

Late/incomplete submission of assignments
Fully completed assignments are due on the date indicated in this syllabus. A *full grade* will be deducted for each week an assignment is late. In case of emergency, please contact the instructor.

Make-ups, rewrites, and extra credit
No make-ups, rewrites, or extra credit opportunities will be allowed. In some cases, the instructor *may* permit rewrites for feedback only (ie, not for grade reconsideration), primarily based on the instructor's availability and the point in the course.

Use of Blackboard (Bb)
All assignments and course documents will be posted on Blackboard. Bb announcements and/or email will used to communicate new information and/or changes. It is the student's responsibility to check Bb frequently for such announcements. In addition, students should be aware that emails sent by the instructor via Bb will be automatically sent to the email address in the Bb system.

Use of Qualitative Software
The instructor recommends using Dedoose (Dedoose.com) which comes with a free one-month trial period, which should be adequate for the course final project as long as the trial begins immediately before data analysis commences. (Use of the software can be continued at approx. $10/month should the student decide to use it beyond the course.)

Expectations of students
Throughout this course, teaching and learning will take place through interactive lecturing utilizing seminar-like discussion of course material, presentations from the instructor and guest lecturers, and class exercises. To effectively learn and master the course material requires a class-by-class sequential approach that builds on skills and concepts. Therefore, students are expected to be prepared for each class by carefully reading the texts and doing the assignments. Students should be "active learners" ready to pose questions to the faculty and their classmates, as well as respond to questions asked of them. Attendance at all classes is required; therefore, students should notify the instructor if they anticipate any absences.

Use of any electronic devices in class must be limited to accessing the course materials under discussion in that session and taking notes. Under no circumstances should these devices be used for communication with others *within or outside of the classroom*. Students are expected to

be fully engaged with and participating in the class; thus, use of any devices that distract the student(s), instructor(s), and/or guest(s) will be considered intrusive and in violation of expected standards of conduct in the classroom. As such, the student may be asked to discontinue use of the device.

Additional expectations are listed below:
- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete assignments by the due date.
- Regularly check the course website and official university email for course correspondence.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

Email correspondence
The instructor will try to respond to emails within a 24-hour period during the Monday through Friday work week. Students should not wait until a Friday to send an email if a response is needed before the following Monday. The instructor may respond over the weekend but it is not guaranteed. Responses that take more than a day during the work week may be due to special circumstances, such as the instructor is attending an out-of-town conference, the student's query is of a complex nature that requires consultation with others/obtaining additional information, etc.

Additional expectations are listed below:
- Provide regular announcements, reminders, and suggestions on Bb and in class
- Provide detailed feedback to students on class assignments
- Communicate about grades and progress in the course to the class as a whole and to individual students, as appropriate

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity
Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

This syllabus and schedule is a *guide* for the course and is subject to change, particularly given the advanced level of the course. Changes will be announced in class and/or will be posted on the course Blackboard site. Also please consult the current academic calendar for important dates (eg, holidays, course drop/withdrawal, etc).

Class /Date	Topic	Readings and Assignments
1 9/2/15	Course overview and introduction: Qualitative research and its methodological tools	Ritchie et al, Ch 1: The Foundations of Qualitative Research Auerbach & Silverstein, Ch 1: Introducing Qualitative Hypothesis-Generating Research Recommended: Peshkin, Alan. The goodness of qualitative research. *Educational Researcher.* 1993;22:23-29. Ragin CC, Nagel J, White P. *Workshop on Scientific Foundations of Qualitative Research (7/11-12/03*). Washington, DC, National Science Foundation, 2004. http://www.nsf.gov/pubs/2004/nsf04219/nsf04219.pdf **DUE**: *For discussion in class*, write a few sentences about a research idea/question that you think can be explored with a qualitative research method.
2 9/9/15	Qualitative Study Design I: Research Questions	Ritchie et al, Ch 2: The Applications of Qualitative Methods to Social Research Auerbach & Silverstein, Ch 2: Designing Hypothesis-Generating Research Auerbach & Silverstein, Ch 3: Qualitative and Quantitative Research as Complementary Strategies Watt D. On becoming a qualitative researcher: The value of reflexivity. *The Qualitative Report*. 2007;12(1):82-101 Recommended: Corbin & Strauss, Ch 2: Practical Considerations **DUE:** Reflexive Memo and CITI certification
3 9/16/15	Qualitative Study Design II: Sampling Strategies	Ritchie et al, Ch 3: Design Issues Ritchie et al, Ch 5: Designing and Selecting Samples

		Recommended: Small ML. 'How many cases do I need?' On science and the logic of case selection in field-based research. *Ethnography*. 2009; 10(1): 5-38. **DUE**: Quant-Qual Questions Exercise (student-pair reviews on Bb)
2/23	NO CLASS (Yom Kippur) **(Get going with Morgan book [FGs])**	
4 9/30/15	Introduction to Data Collection Methods and Asking Open-Ended Questions	Ritchie et al, Ch 6: Designing Fieldwork (IDIs and FGs) Recommended: Ulin, Robinson & Tolley, Ch 4: Collecting Qualitative Data **DUE**: Central research focus and methods proposal draft
5 10/7/15	Data Collection I: Focus Groups	Morgan DL. *Focus Groups as Qualitative Research*. 2nd ed. Thousand Oaks, CA: Sage; 1997. [the *complete* handbook] Romero D, Kwan A, Swearingen J, Nestler S, Cohen N. Impact of the closure of a large urban medical center: A qualitative assessment. *Journal of Community Health*. 2012;37:982-994. Recommended: Ritchie et al, Ch 8: Focus Groups Morgan DL. Reconsidering the role of interaction in analyzing and reportinging focus groups. *Qual Health Res.* 2010;20:718-722. Shelley D, Cantrell MJ, Moon-Howard J, Ramjohn DQ, Vandevanter N. The $5 man: the underground economic response to a large cigarette tax increase in New York City. *Am J Public Health*. 2007;97(8):1483-8. Goudet SM, Faiz S, Bogin BA, Griffiths PL. Pregnant women's and community health workers' perceptions of root causes of malnutrition among infants and young children in the slums of Dhaka, Bangladesh. *Am J Public Health*. 2011;101(7):1225-33. Paz MG, Fry D. Bringing the Global to the Local: Using Participatory Research to Address Sexual Violence with Immigrant Communities in NYC. 2008. *(participatory research, focus groups with pictoral/image instruments)* *Qualitative Health Research* special issue on focus groups methods: May 2010; 20(5).

6 10/14/15	Data Collection II: In-Depth Interviews	Ritchie et al, Ch 7: In-depth Interviews Edin K, Kefalas M. *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*. Berkeley, CA: University of California Press; 2005. (Ch 1: Introduction, p. 1-26; App. A: City, neighborhood, family characteristics, and research methods, p. 225-247; App. B: Interview Guide) Romero [In class: Field Logistics—SPAFF project: training materials, sampling; L-GEAR] <u>Recommended</u>: Merry L, Clausen C, Gagnon AJ, et al. Improving qualitative interviews with newly arrived migrant women. *Qual Health Res*. 2011;21:976-86. Grineski S. Childhood asthma, public housing, and environmental control: Differences between families renting with section 8 vouchers and those living in the projects. *J Pov*. 2008;12:432-55. Ghose T, Swendeman DT, George SM. The role of brothels in reducing HIV risk in Sonagachi, India. *Qual Health Res*. 2011;21:587-600. Grossman D, Holt K, Peña M, et al. Self-induction of abortion among women in the United States. *Reprod Health Matters*. 2010;18(36):136-46. **DUE:** *REVISED* Research question and methods proposal
7 10/21/15	Data Collection III: Participant/Field Observation, Ethnography	Ritchie et al, Ch 9: Observation Shuler S, Sypher BD. Seeking emotional labor: When managing the heart enhances the work experience. *Management Communication Quarterly.* 2000;14:50-89. [Triangulated participant observation, interviews, and 911 call data]. Hirsch JS, Higgins J, Bentley ME, Nathanson CA. The social constructions of sexuality: marital infidelity and sexually transmitted disease-HIV risk in a Mexican migrant community. *Am J Public Health*. 2002;92(8):1227-37. <u>Recommended</u>: Lopez I. *Matter of Choice: Puerto Rican Women's Struggle for Reproductive Freedom*. New Brunswick, NJ: Rutgers University

		Press; 2008. [sterilization] Fadiman A. *The Spirit Catches You and You Fall Down: A Hmong Child, Her American Doctors, and the Collision of Two Cultures*. New York: Farrar, Straus, and Giroux; 1998. Rapp R. *Testing Women, Testing the Fetus: The Social Impact of Amniocentesis in America*. New York: Routledge; 1999. Ch. 1: How Methodology Bleeds into Daily Life, pp. 1-22. **DUE**: Data collection instrument (student-pair reviews on Bb)
8 10/28/15	Data Collection IV: Document Review, Content Analysis	Borzekowski DL, Schenk S, Wilson JL, Peebles R. e-Ana and e-Mia: A content analysis of pro-eating disorder Web sites. *Am J Public Health*. 2010;100:1526-34. Ray JL, Smith AD. Using photographs to research organizations: Evidence, considerations, and application in a field study. *Organizational Research Methods.* 2012;15:288-315. [visual methods] Latimer AE, Green KE, Schmid K, et al. The identification of framed messages in the New York State Smokers' Quitline materials. *Health Educ Res*. 2010;25(1):54-60. Hussain H, Omer SB, Manganello JA, et al. Immunization safety in US print media, 1995-2005. *Pediatrics*. 2011;127 Suppl 1:S100-6. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qualitative Health Research*. 2005;15:1277-1288. <u>Recommended</u>: Offen N, Smith EA, Malone RE. "Willful misconduct": how the US government prevented tobacco-disabled veterans from obtaining disability pensions. *Am J Public Health*. 2010;100:1166-73. Almeida-Filho N, Kawachi I, Filho AP, Dachs JN. Research on Health Inequalities in Latin America and the Caribbean: Bibliometric Analysis (1971-2000) and Descriptive Content Analysis (1971-1995). *Am J Public Health*. 2003;93:2037-2043. Gilmore A, Collin J, Townsend J. Transnational tobacco company influence on tax policy during privatization of a state monopoly: British American Tobacco and Uzbekistan. *Am J Public Health*. 2007;97(11):2001-9.

		DISCUSS: student review of data collection instruments
9 11/4/15	Qualitative Data Analysis I: Approaches & Techniques	Auerbach & Silverstein, Ch 4: Coding 1—The Basic Ideas Corbin & Strauss, Ch 6: Memos & Diagrams <u>Recommended</u>: Ritchie et al, Ch 10: Analysis: Principles and Processes
10 11/11/15	Qualitative Data Analysis II: From Data Reduction & Analysis to Results	Auerbach & Silverstein, Ch 5: Coding 2—The Mechanics *(Phase 1: Making the Text Manageable)* Auerbach & Silverstein, Ch 6: Coding 2—The Mechanics *(Phase 2: Hearing What Was Said)* Auerbach & Silverstein, Ch 7: Coding 2—The Mechanics *(Phase 3: Developing Theory)* <u>Recommended</u>: Ritchie et al, Ch 11: Analysis in Practice Miles, Huberman, Saldana Ch 11: Drawing and Verifying Conclusions, p. 275-322 **DUE**: Code book (***or*** 1 of 2 other options due next week)
11 11/18/15	Qualitative Data Analysis III: Writing	Ritchie et al, Ch 13: Writing Up Qualitative Research Miller DL, Creswell JW, Olander LS. Writing and retelling multiple ethnographic tales of a soup kitchen for the homeless. *Qualitative Inquiry.* 1998;4:469-491. [Ethnography; Writing <-> Interpretation; different yet non-contradictory findings] <u>Recommended</u>: Corbin & Strauss, Ch 13: Writing thesis, monographs, & giving talks, p. 275-295. Wolcott HF. *Writing Up Qualitative Research*. 3rd ed. Los Angeles: Sage; 2009. Ulin, Robinson & Tolley, Ch 7: Putting It Into Words: Reporting Qualitative Research Results **DUE**: Data display or analytic memo (***if*** did not submit codebook last week)

12 11/25/15	Generalization and Validity (a.k.a. Credibility, Truthfulness)	Auerbach & Silverstein, Ch 8: Convincing Other People: The Issues Formerly Known as Reliability, Validity and Generalizability Ritchie et al, Ch 12: Generalising from Qualitative Research Maxwell JA. Understanding and validity in qualitative research (Ch. 2). In Huberman AM, Miles MB, eds. *The Qualitative Researcher's Companion*. Thousand Oaks, CA: Sage; 2002.
13 12/2/15	Dissemination of Findings, Research Ethics, and Other Reflections on Qualitative Research	Ritchie et al, Ch 4: Ethical Considerations in Qualitative Research Baum F. Researching public health: behind the qualitative-quantitative methodological debate. *Soc Sci Med*. 1995;40:459-68. Newman KS. Qualitative research on the frontlines of controversy. *Soc Meth Res*. 2002; 31:123-130. <u>Recommended</u>: Ulin, Robinson & Tolley, Ch 8: Disseminating Qualitative Research Babbie E. Laud Humphreys and research ethics. *International Journal of Sociology and Social Policy*. 2004; 24: 12-19. Nardi PM. "The Breastplate of Righteousness": Twenty-five years after Laud Humphreys' tearoom trade: Impersonal sex in public places. *J Homosexuality*. 1995;30:1-9. Glesne C. But is it ethical? Learning to do it right. (Ch. 6). *Becoming Qualitative Researchers: An Introduction*. 3rd ed. Boston: Pearson, 2006.
14 12/9/15	Student Research Projects	**DUE:** Student Presentations (15 min)
15 12/16/15	Student Research Projects	**DUE:** Student Presentations (15 min) **FINAL PAPER DUE Mon, 12/21/15**

Last Updated September 2, 2015

Session	Due Date	Assignment
Session 1	9/2/15	- Assigned readings - Bring research idea to class
Session 2	9/9/15	- Assigned readings - Reflexive Memo and CITI certificate
Session 3	9/16/15	- Assigned readings - Quant-Qual questions exercise (student-pair reviews on Bb)
Session 4	9/30/15	- Assigned readings - Central Research Focus and Methods Proposal (draft)
Session 5	10/7/15	- Assigned readings
Session 6	10/14/15	- Assigned readings - Central Research Focus and Methods Proposal (revised)
Session 7	10/21/15	- Assigned readings - Data Collection Instrument (student-pair reviews on Bb)
Session 8	10/28/15	- Assigned readings - Discussion: student reviews of data collection instruments
Session 9	11/4/15	- Assigned readings
Session 10	11/11/15 (Choose **either** this assignment **or** 1 of the 2 for next week)	- Assigned readings - Code Book (code families and sub-code definitions developed *up to this point)*
Session 11	11/18/15	- Assigned readings - Data Display *or* Analytic Memo (types of data analysis processes, for where ever you are *at this point*)
Session 12	11/25/15	- Assigned readings
Session 13	12/2/15	- Assigned readings
Session 14	12/9/15	Final Project PowerPoint Presentations (15 min)
Session 15	12/16/15	Final Project PowerPoint Presentations (15 min) **FINAL PAPER DUE / /2015**

Last Updated August 6, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
EOHS 70N02: Advanced Methods in Industrial Hygiene
4 Credits
Fall 2015

Time and location	Thursday 6:05PM - 9:45PM Silberman 318
Instructor	Dr. Brian Pavilonis, Ph.D. Silberman Room 721 212-396-7739 Bp305@hunter.cuny.edu (preferred method of contacting me)
Office hours	Monday and Wednesday 4:00P,M – 6:00 PM
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This advanced industrial hygiene course examines methods for assessing physical hazards and occupational controls of workplace hazards, including noise, radiation (ionizing and non-ionizing), vibration, thermal stress, and pressure. Students examine potential worker exposure to physical agents, assess exposure to physical agents, determine when physical agents may be hazardous to workers, and recommend strategies for controlling exposures, where necessary. The course also explores the fundamentals of design, operation and evaluation of air moving systems for local and dilution exhaust ventilation systems.
Course prerequisites	PH 75400, EOHS 70200 and EOHS 75700 or EOHS advisor approval.
Course format	Weekly in-class lecture and laboratory demonstrations
Required reading and resources	• Fundamentals of Industrial Hygiene, Author: Barbara Plog, Publisher: National Safety Council, Edition: 6th, Year Published: 2012 • Ventilation for Control of the Work Environment, Authors: William A. Burgess, Michael J. Ellenbecker, Robert D. Treitman, Edition: 2nd
Suggested reading and resources	Supplemental reading assignments will be posted on Blackboard or available online. It is the student's responsibility to keep track of supplemental reading assignments.

Last Updated August 6, 2015

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
1. Apply the core functions of PH practice (assessment, policy development, and assurance)	• Interpret and apply applicable occupational and environmental regulations in order to recognize, evaluate and control hazards in the workplace. • Apply course information, engineering design considerations and system performance factors to propose effective ventilation system designs to control specific airborne occupational exposure hazards.	All assignments Test 1 and 2
2. Understand basic theories, concepts, models and methods from a range of core and related disciplines and apply them to the design of PH research, policy, and practice.	• Describe the basic properties and health effects of physical hazards • Understand the scientific disciplines that contribute to the ability to recognize and control occupational exposures that may lead to work-related diseases.	Assignments 1-3; 6 Test 1 and 2
3. Use basic statistical and informatics techniques	• Develop an understanding of static, velocity, and total pressures and how they relate to ventilation system efficiency • Develop ability to recognize and correct ventilation system deficiencies based on design performance. • Understand and apply the basic principles of assessment and control of physical hazards in the workplace. • Apply industrial hygiene formulae used to quantify exposures to physical agents and effectiveness of control measures	All assignments Test 1 and 2
4. Explain key social, behavioral, biomedical and environmental determinants of and inequities in health and disease across the lifespan in urban settings	• Apply preventive control strategies that greatly reduce these workplace exposures and prevent associated occupational disease.	Assignments 4-6 Test 2
5. Design and evaluate interventions to prevent or control urban PH problems	• Describe the hierarchy of controls designed to protect workers, and provide examples of each level of control. • Understand work processes, tasks and exposure factors that contribute to airborne exposure risk for workers and apply ventilation-based control principles to reduce these exposure risks. • Identify ventilation system design and performance issues that enhance control of airborne contaminants. • Be familiar with recognized design and performance considerations for effective and efficient operation of local and general exhaust ventilation systems. • Understand the proper function and apply methods to evaluate the effectiveness of hoods, ducts, transitions and fans.	Assignments 4-6 Test 2
6. Describe the legal foundations of the US PH system and its interrelationships with other systems (e.g. health care, education, environmental protection)	• Interpret and apply applicable occupational and environmental regulations with regard to the need for hazard assessment and engineering controls. • Gain familiarity with workplace regulatory requirements, consensus standards, and the basis of occupational exposure standards.	All assignments Test 1 and 2

Last Updated August 6, 2015

EOHS Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
1. Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	• Understand work processes, tasks and exposure factors that contribute to occupational exposure and apply control principles to reduce these exposure risks.	Assignments 1-3; 6 Test 1 and 2
2. Predict and prevent health, safety and environmental risks from processes, work tasks, the built environment and other economic and/or social activities	• Describe the basic properties and health effects of physical hazards • Understand, and to the extent possible become familiar with examples of common industrial processes, operations and manufacturing techniques found in the US. • Understand work processes, tasks and exposure factors that contribute to exposure risk for workers and apply control principles to reduce these exposure risks. • Understand the scientific disciplines that contribute to the ability to recognize and control occupational diseases.	All assignments Test 1 and 2
3. Evaluate the human health risks from CBPS hazards using qualitative, quantitative and/or instrumental assessment methods	• Describe routes of entry to chemicals and exposure to physical agents in the occupational environment • Be familiar with recognized design and performance considerations for effective and efficient operation of local and general exhaust ventilation systems.	Assignments 1-3; 6 Test 1 and 2
4. Recommend appropriate engineering, personal protection or administrative controls and policies for CBPS hazards and evaluate their effectiveness.	• Describe the hierarchy of controls designed to protect workers, and provide examples of each level of control. • Apply knowledge gained during this course to design a basic local exhaust ventilation system. • Apply course information, engineering design and performance considerations to propose effective ventilation system designs to control specific airborne environmental and occupational exposure hazards.	Assignments 1-3; 6 Test 1 and 2

Course Assessments

Two, equally weighted, take home exams will be given. Exams are due on the date listed below. Exams should be written legibly with all calculations shown. Grading will be based on accuracy of the answer and problem solving. Exams can be scanned and submitted via email or handed in to the instructor.

Six, equally weighted, homework assignments will be given throughout the course. You may drop the lowest grade. It is due prior to the start of class. You must show all your work and write legibly in order to receive full credit. We will spend a significant portion of class time going over the solutions to problems and you will be called on in class to present answers.

Grading

Evaluation criteria

Describe the grading methodology that will be used to assess performance in the class. If a rubric is not used, what method will be used to evaluate graded assignments?

The relative weight of each course component is as follows:

Assessment	Weight
Homework Assignments	30%
Test #1	30%
Test #2	30%
Participation	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty

generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Class attendance will be taken every session. Students must sign in at the beginning of class. 10% of the final grade is class participation. It is your responsibility to sign in every class period.

Late/incomplete submission of assignments

Homework and exams handed in 24 hours after the due date will be given 75% credit. No credit will be given for work handed in after 24 hours.

Make-ups, rewrites, and extra credit

No make-ups, rewrites, or extra credit will be allowed in the course.

Expectations of students

Students are expected to come to class prepared to discuss the lesson and homework assignments.

Please silence your cell phones prior to class the start of class. If it is an emergency and you need to make a phone call please quickly and quietly leave the class. Please refrain

from texting and checking email while in class as this is disruptive to the instructor and fellow students. Everyone should be respectful of each other's opinions and questions

Expectations for the instructor

I am available for extra help outside of class. Students are encouraged to stop by my office for help with exams and homework assignments. The classroom is a place for discussion and I welcome students questions about the topic that will be covered in the course.

I am available by email at Bp305@hunter.cuny.edu during business hours to answer questions by email. Please do not abuse the email privilege. Consult the syllabus, blackboard, and other course materials first for answers to your questions. Allow 24 to 48 hours for an email response. I cannot answer email while teaching, in meetings, and while I am working on research. I am often not available by email after business hours, on weekends, and during holidays.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Please note that schedule is subject to change throughout the semester. The "Last Updated" Date in the header of the syllabus is meant to reference the current version of the syllabus and therefore should be updated if a change in schedule is made.

Please refer to the current academic calendar (available at hyperlink below) for important dates (for example: holidays, course drop, course withdrawal).
http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%20-Repaired-FINAL.pdf

Session Number	Date of Session	Topic	Assigned Readings	Assignments Due
1	27-Aug	Introduction to physical hazards/ Noise	Plog Chapter 4	
2	3-Sep	Noise	Plog Chapter 9	
	10-Sep	No Class		
3	17-Sep	Ionizing radiation	Plog Chapter 10	Assignment #1
4	24-Sep	Non-ionizing radiation	Plog Chapter 11	
5	1-Oct	Thermal stress	Plog Chapter 12	Assignment #2
6	8-Oct	Ergonomics/ Vibration	Plog Chapter 13	
7	15-Oct	No Class Take home Test		
8	22-Oct	Introduction to ventilation/ Principles of airflow	Burgess Chapter 1 and 2	Exam #1
9	29-Oct	Airflow measurements/ General exhaust ventilation	Burgess Chapter 3 and 4	Assignment #3
10	5-Nov	Local exhaust ventilation- hood design Last day to drop course	Burgess Chapter 5	Assignment #4
11	12-Nov	Chemical laboratory ventilation	Burgess Chapter 7	
12	19-Nov	Fan selection	Burgess Chapter 10	Assignment #5
	26-Nov	No Class		
13	3-Dec	Design of single hood systems	Burgess Chapter 8	
14	10-Dec	Design of multiple hood systems	Burgess Chapter 9	Assignment #6
15	17-Dec	No Class Take home Test		
	23-Dec	No Class Take home Test		Exam #2

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
EOHS 70200 Introduction to Occupational Safety and Health
3 Credits
Fall 2015

Time and location	Silberman, Room 326, Tuesdays from 6:05 PM to 7:50 PM
Instructor	Grace Sembajwe, ScD, MSc Office: Room 527 (Silberman, 2180 3rd Ave.) Office Phone: (212)396-7735 Email: gsembajw@hunter.cuny.edu
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Introduction to basic concepts and issues of occupational safety and health, including recognition and control of chemical and physical hazards, and the regulations governing these hazards.
Course prerequisites	N/A
Course format	Introduction to basic concepts and issues of occupational safety and health, including recognition and control of chemical and physical hazards, and the regulations governing these hazards.
Required reading and resources	Levy and Wegman, eds., Occupational and Environmental Health: Recognizing and Preventing Disease and Injury, Oxford 6th edition, 2011. ISBN-13: 9780195397888 $ $60.79. [earlier editions acceptable] Selected reading for assignment 2 (select one): Jimmy Breslin, The Short Sweet Dream of Eduardo Gutierrez, Three Rivers Press, 2003 or David Von Drehle, Triangle: The Fire That Changed America, Grove Press, 2003. Supplemental reading assignments will be posted on BlackBoard, available online, or by handouts. It is the student's responsibility to keep track of supplemental reading assignments.
Suggested reading	Plog, B. and Quinlan, P. (eds) Fundamentals of Industrial

and resources	Hygiene, 5th edition, National Safety Council. 2002. ISBN 9780879122164. $190. DiNardi, S. (ed.) The Occupational Environment—Its Evaluation, Control and Management 2nd edition. AIHA. 2003. ISBN 1931504431. Includes interactive CD, $125 AIHA non-member, $49 member. National Safety Council, Accident Prevention Manual, Engineering and Technology, 13th edition, NSC, 2009, ISBN: 9780879122812, $190. National Safety Council, Accident Prevention Manual, Administration and Programs, 13th edition, NSC, 2009, ISBN: 9780879122805, $190.

Last Updated July 23, 2015

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Explain the significance of key events in the history of occupational health in the US and identify individuals who made noteworthy contributions	• Class discussion (sessions 1-4), Assignment 2, Term paper • Midterm and Final
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Explain the role and interrelationships between the scientific disciplines that contribute to the recognition and control of occupational diseases	• Class discussion (sessions 1-7, 9), Assignment 2, Term paper • Midterm and Final
Adhere to ethical and social justice principles and standards	• Explain the ethical dilemmas facing occupational health safety professionals in addressing the challenges facing immigrant workers	• Class discussion (sessions 1-4, 10-14), Assignment 2, Term paper • Midterm and Final
Interpret and analyze public health literature and apply evidence-based research	• Explain the origin, scientific basis, implementation, strengths and weaknesses of exposure criteria and standards, including occupational exposure limits, for priority hazards, such as noise, asbestos, silica, lead and mercury	• Class discussion (sessions 1-7, 9, 12-14), Assignment 2, Term paper • Midterm and Final
Apply basic statistical and informatics techniques	• Calculate and interpret basic measures of workplace injury, illness and mortality including incidence rates from BLS and other data systems • Analyze the uses and limitations of existing data systems for determining the burden of occupational injury and illness	• Class discussion (sessions 1-7), Assignment 2, Term paper • Midterm and Final

Explain how social, behavioral, biomedical and environmental determinants affect population health	• Explain the sources of inequality in occupational disease risk factors, exposures and outcomes and community and regulatory-based interventions for addressing them • Analyze the occupational health and safety challenges facing immigrant workers in the US and in NYC	• Class discussion (sessions 1-4, 10-14), Assignment 2, Term paper • Midterm and Final
Design and evaluate interventions to prevent or control public health problems	• Apply the hierarchy of controls designed to protect workers in specific work settings and analyze their respective strengths and weaknesses • Apply occupational safety and health regulations to reduce exposure risks arising from specific work processes • Assess the uses and limitations of Material Safety Data Sheets and the globally harmonized system of hazard communication.	• Class discussion (sessions 1-7, 9), Assignment 2, Term paper • Midterm and Final
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Explain the basic legal infrastructure that exists for worker protection in the US, including worker's compensation, federal and state regulatory agencies and various consensus organizations • Evaluate the respective role that regulatory and non-regulatory organizations can play a role in monitoring and preventing occupational illness and injury • Explain key provisions of the major federal and state environmental and occupational health laws and regulations • Recommend appropriate legislative controls and updates to strengthen existing regulations	• Class discussion (sessions 1-7, 9-14), Assignment 2, Term paper • Midterm and Final

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	• Identify and classify the major chemical, biological, physical safety (CBPS) workplace hazards, and their sources • Explain the role and interrelationships between the scientific disciplines and professions that contribute to the recognition and control of occupational diseases.	• Class discussion (sessions 1-4, 9, 12, 13), Assignment 1 and 2, Term paper • Midterm and Final
Predict and prevent health, safety and environmental risks from processes, work tasks, the built environment and other economic and/or social activities	• Explain work flow processes that potentially contribute to chemical, biological, physical and safety exposures and hazards in key industries and work settings. • Develop work process flow charts for key industries.	• Class discussion (sessions 2, 5, 6, 7, 9-13), Assignment 1 and 2, Term paper • Midterm and Final
Evaluate the human health risks from CBPS hazards using qualitative, quantitative and/or instrumental assessment methods	• Describe routes of entry to chemicals and exposure to physical agents in the occupational environment	• Class discussion (sessions 2, 7, 9-13), Assignment 1 and 2, Term paper • Midterm and Final
Recommend appropriate engineering, personal protection or administrative controls and policies for CBPS hazards and evaluate their effectiveness.	• Apply the hierarchy of controls designed to protect workers, with specific examples of each level of control and analyze their respective strengths and weaknesses. • Interpret and apply occupational safety and health regulations to reduce exposure risks.	• Class discussion (sessions 1-4), Assignment 1 and 2, Term paper • Midterm and Final

Course Assessments

GRADING:
Attendance: 10
Midterm: 30
Final: 30
2 Assignments: 10 (5 points each)
Term Paper: 20

Attendance and participation: Students are expected to participate in online and in-class discussions.

Assignment 1 (overview)
Material Safety Data Sheet (MSDS) review (instructional handout to be posted on BB)
Are MSDSs informative, accurate and understandable? Students will work independently to select and review an MSDS for a commercial or retail chemical product (for example: gasoline, degreasing solvent, rust remover, graffiti remover, spray paint, oven cleaner, drain cleaner, and etc.) An instructional handout will be provided listing a series of questions the student will address in short answer format. The assignment will help students to identify the strengths and weaknesses of this chemical hazard information source and the impacts of a globally harmonized system on the MSDS process.

Assignment 2 (overview): Selected reading summary (instructional handout to be posted on BB)
Students will select one of the two books listed in the selected reading section above. An instructional handout will be provided that addresses safety issues and how they are described in the selected book. The student will answer a series of questions in short answer format.

Term Paper (Overview)
Students will work independently to research and prepare a paper of approximately 10 pages (double spaced with 1" margins). Select a particular occupational health or safety hazard and an industry where that hazard is found. You should aim to be as focused and specific as possible. The paper should address the following issues:

- Description of the hazard (chemical, physical properties, adverse health effects, toxicological and/or epidemiological information)
- Description of the industry and where the hazard exists in that industry
- Data showing the number of workers who are at risk and the number (or rate) of injuries or illnesses that are associated with the hazard
- The regulations and/or consensus organization recommendations pertaining to the hazard
- What, if any, improvements have been instituted, or can be instituted, to eliminate or mitigate the hazard.

- Include at least 5 different references, 3 from peer-reviewed journals.
- Internet citations are OK, but full web site address must be provided, and the site must be from a government agency or a university.
- Citations must follow the American Journal of Public Health style of papers. Refer to the Graduate Student Manual for additional information.
- Hardcopy of the paper is due in class December 11th, 2012.

Grading of the paper will be based on:

1. The presentation: did the paper follow the guidelines?
2. The cohesiveness of the argument: is there a logical flow to the paper, do the sections fit together, do the recommendations and conclusions follow from the information presented?
3. The extent to which the paper reflects an understanding of the material gleaned from the journals and other information sources.
4. Writing skills: grammar, spelling, punctuation (to the extent that they enhance or dampen understanding of the paper)

Goals: To introduce students to basic concepts and issues of occupational safety and health, including recognition and control of chemical and physical hazards and the regulations governing these hazards, within the larger context of work in the USA.

Grading

The relative weight of each course component is as follows:

Assessment	Weight
Attendance	10%
Midterm	30%
Final	30%
Assignments 1 and 2	10%
Term paper	20%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the

student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Students are expected to attend every class session and complete the readings prior to each of the class sessions so as to be able to participate fully during the class. The instructor should be notified by email or voicemail if an absence is unavoidable. It is the student's responsibility to obtain missed class notes and related information from a colleague. Assignments must be received by the due dates regardless of class attendance.

Late/incomplete submission of assignments

Assignments are due on the date indicated in this syllabus. A full grade will be deducted for each week an assignment is late. In case of emergency, please contact the instructor. Incomplete final grades for this course will NOT be granted unless the request is justified by a legitimate and documented emergency.

Make-ups, rewrites, and extra credit

There will be no opportunity to do additional work for extra credit.

Expectations of students

Class citizenship & rules of conduct
Cellphones and other electronic devices
Use of any electronic devices in class must be limited to accessing the course materials under discussion in that session and taking notes. Under no circumstances should these devices be used for communication with others within or outside of the classroom. Students are expected to be fully engaged with and participating in the class; thus, use of any devices that distract the student(s), instructor(s), and/or guest(s) will be considered intrusive and in violation of expected standards of conduct in the classroom. As such, the student may be asked to discontinue use of the device

Last Updated July 23, 2015

Expectations for the instructor

Email correspondence

The instructor will try to respond to emails within a 24-hour period during the standard Monday through Friday work week. Students should not wait until a Friday to send an email if a response is needed before the following Monday. The instructor may respond over the weekend but it is not guaranteed. Responses that take more than a day during the work week may be due to special circumstances, such as the instructor is attending an out-of-town conference, the student's query is of a complex nature that requires consultation with others/obtaining additional information, etc.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Use of Blackboard
All assignments and course documents will be posted on Blackboard (Bb). Bb announcements and/or email will used to communicate new information and/or changes. It is the student's responsibility to check Bb frequently for such announcements.

Course/syllabus changes
This syllabus is a guide for the course and is subject to change. Changes will be announced in class and will be posted on the course Blackboard site.

Session	**Date**	**Topic**	**Reading**	**Assignment Due**
1	9/1	Introduction: The Historical Background The Social and Political Context The Occupational Health Professions	Reading: OEH ***6th edition Chap. 1***	
2	9/8	Recognition of Occupational Disease Toxicology and Epidemiology, Industrial Hygiene and Occupational Safety	Reading: OEH ***6th edition Chaps. 2,24,26,27***	

3	9/25 (Friday following a Tuesday schedule)	The Legal and Regulatory Framework: Worker's Compensation, Tort Litigation, Federal and State OSHA The OSHAct, NIOSH, Consensus Organizations Handout for Assignment 1: MSDS evaluation and review	Reading: OEH ***6th edition Chaps. 3, 4, 28, 30[pp. 611-620, 640-645, 660]*** OSH Act (available at www.osha.gov)	
4	9/29	Regulatory Framework (continued) Health and Safety Standards		**Topic selection for term paper due**

5	10/6	Criteria and Standards for selected substances: Fibrogenic dusts: Asbestos and silica	Reading: OEH ***6th edition Chap. 18*** NIOSH Criteria Documents (http://www.cdc.gov/niosh/critdoc2.html) OSHA Silica National Emphasis Program - 2008 OSHA Silica Special Emphasis Program - 1996 (see BlackBoard, "Bb" for additional links)	
6	10/13 **DISCUSS ONLINE**	Criteria and Standards of select substances: Heavy metals: lead and mercury	Reading: NIOSH Criteria Documents (see Bb for links)	**Assignment 1 Due:** MSDS evaluation and review
7	10/20	Criteria and Standards of select substances Organic solvents: MEK and methylene chloride Handout for assignment 2: Selected reading summary	Reading: NIOSH Criteria Documents (see Bb for links)	
8	10/27	**MIDTERM**		
9	11/3	Exam Review Physical hazards in the workplace: noise, heat stress, radiation	Reading: OEH ***6th edition Chap 12***	

10	11/10	Industry Safety and Health Profiles: Construction	Reading: OEH ***6th edition Chaps. 15, 36*** Construction Chartbook http://www.cpwr.com/rp-chartbook.html	
11	11/17	Industry Safety and Health Profiles: Health Care	Reading: OEH ***6th edition Chap 36***	
12	11/24	The Role of Labor Unions in Occupational Health	Reading: OEH ***6th edition Chaps. 32***	**Assignment 2 Due**: Selected reading summary
13	12/1	Emerging occupational groups and implications for safety and health: Immigrants Discussion: Triangle and Short Sweet Dreams	Reading: OEH ***6th edition Chap. 4***	
14	12/8	Safety and Health Programs: ANSI Z10, OHSAS 18001, OSHA VPP	Reading: ANSI Z10 and OHSAS 18001 summaries posted on BB	Term Paper Due
15	12/15	**FINAL EXAM**		

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

EOHS 70500 Environmental Chemistry

3 Credits - Fall 2015

Hunter College – City University of New York

Time and location	Thursday 8:00-9:45 pm, Room 324 Silberman
Instructor	Jack Caravanos, DrPH, CIH Professor, CUNY School of Public Health 2180 3rd Ave, Room 720, Phone 212-396-7780 jcaravan@hunter.cuny.edu
Office hours	Online and Thursday 4-6 pm in my office
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Basic review of inorganic and organic chemistry using environmental examples. Introduction of important chemistry principles as applied to air, water, soil, and industrial hygiene.
Course prerequisites	None
Course format	This is a lecture-based course presented in a 15-week format. All sessions are recorded and made available online through Blackboard.
Required Reading	• *Principles of Environmental Chemistry*, 2nd Edition, JE Girard, Jones and Bartlett, Sudbury, MA. Available at online. Most of the content of this text is found in the first edition of PEC. Students who purchase the first edition used will be allowed to use it, and instructed on the concordance of chapters and problems • *Quantitative Industrial Hygiene;* J. Caravanos*, ACGIH, Cinc. Ohio.* Available www.acgih.org
Suggested readings / resources	Posted online as needed.

ABET Program Objectives:

1. Learn about common industrial processes, operations and manufacturing techniques found in the US.
2. Develop ability to identify, describe qualitatively, and quantify agents, factors, and stressors generated by and/or associated with defined sources, unit operations, and/or processes.
3. Develop an understanding of the qualitative and quantitative aspects of exposure assessment, dose-response, and risk characterization based on applicable pathways and modes of entry.
4. Learn the fundamental aspects of safety and environmental health
5. Acquire the knowledge needed to attain recognized professional certification

MPH Competencies

6. Identify and classify chemical, biological and physical hazards.
7. Describe the migration of contaminants through various environmental compartments, such as air, water and soil, for purposes of determining the nature of the environmental health risk.
8. Identify and select the appropriate direct reading instruments and measurement units for the evaluation of chemical, biological and physical hazards in the workplace and urban environment.
9. Identify local and regulatory organizations that can play a role in environmental monitoring and disease prevention within communities and the workplace.

10. Use a computer spreadsheet program for data presentation and graphing.
11. Describe New York City's air quality, water quality, solid and hazardous waste management and occupational health programs

Specialization Competencies	**Course Learning Objectives**	**Assessment Methods**
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	Describe the sources, chemistry and material flow of the major environmental agents such as asbestos, heavy metals, petroleum hydrocarbons, PCB and common pesticides.	1. Hazard identification exercise following viewing of "monster crusher" video . 2. Online assessment video quiz (Lake Nyos) 3. Examination questions
Predict and prevent health, safety and environmental risks from processes, work tasks, the built environment and other economic and/or social activities	Describe the migration of contaminants through air, water and soil, for purposes of determining the nature of the environmental health risk.	1. Online assessment video quiz (Queens Aquifer Contamination Case Study) 2. Take home problem set 3. Examination questions
Evaluate the human health risks from CBPS hazards using qualitative, quantitative and/or instrumental assessment methods	Select and the appropriate measurement units for the evaluation of chemical, biological and physical hazards and interpret the health risks associated with levels found in the workplace and urban environment.	1. Online assessment video quiz (Minamata Case Study) 2. Case study – Urban Chromium Exposure 3. Examination questions

Course Assessments

There are 3 exams, weekly assignments and a final project.

Data Assignment:

On the first day of class you will be given an environmental topic to research. Each student must assemble tabular and graphical data on this topic and submit an interpretation through a narrated PowerPoint presentation. The format of the presentation should be 5 tables, figures, graphs with a written paragraph describing the findings. Grading will be based on format, quality of graphs and data representation, organization and effectiveness of presentation. Use PPTs "narration" feature to record your presentation. You will submit this through BB as either a narrated PPT or common video file (MP4, WMV or QuickTime)

Grading Criteria for Course

Exam 1,2,3	3	20%	60%
Assignments	10	2%	20%
Final Project	1	20%	20%
			100%

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
This is a fully online course and attendance is not recorded. The synchronous (live) sessions are strongly recommended and students will be responsible for comments or notices made in these sessions. Each synchronous session is recorded for future viewing in the event you cannot attend the live sessions.

Late/incomplete submission of assignments
Late or incomplete assignments are accepted with penalty unless approved by instructor.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students
- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion and online forums.
- Complete all assignments by their assigned due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor
- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours
- Grading and feedback on assignments (when applicable) within 1 week after the due date.
- Communication about grades and progress in the course will be given through the course website.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

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Course Schedule

Refer to the current academic calendar for important dates.

Class	Date	Topic	Readings
1	Aug 27	Course Introduction / Basic Chemistry Principles and Terms; Env Units	PEC 1
2	Sept 3	Solubility - Henry's Law, Partition Coefficients, Solubility (online lesson - NO CLASS meeting)	PEC 1
3	Sept 17	Air Chemistry - Atmospheric chem, Greenhouse Gases, Ozone	PEC 2,3
4	Sept 24	Air Chemistry – photo oxidants, acid rain, Stoke's law	PEC 4, 5
5	Oct 1	**EXAMINATION #1 (online, no class meeting)**	
6	Oct 8	Industrial Hygiene Chemistry (conversions, Charles', Boyle's Law)	QIH
7	Oct 15	Industrial Hygiene Chem (analytical calculations; calculation of conversion factors)	QIH
8	Oct 22	Water Chem - Nitrogen, Phosphorus, BOD	PEC 7
9	Oct 29	Water Chem - Turbidity, Solids, Chlorine Chemistry	PEC 8
10	Nov 5	**EXAMINATION #2 (online, no class meeting)**	
11	Nov 12	Toxicological Chemistry - metals (Pb, Cd, Hg, Cr, As)	PEC 13
12	Nov 19	Toxicological Chemistry - pesticides, PCBs	PEC 14
13	Dec 3	Soil Chemistry / Petroleum Chemistry	PEC 17, 18
14	Dec 10	Hazardous Waste Chem - pyrolysis, waste treatment technologies	PEC
15	Dec 7	**EXAMINATION #3 (online, no class meeting)**	

Last Updated August 4, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
EOHS 745.00 Hazardous Materials & Waste Management
3 Credits
Fall 2015

Time and location	Wednesday, 6:05pm to 7:50pm, Silberman (2180 3rd Ave), Room 322
Instructor	Koshy Kayalikal Koshy, PhD Adjunct Assistant Professor, CUNY School of Public Health Phone 732-235-9459 koshyko@rutgers.edu (preferred contact) kkoshy@hunter.cuny.edu
Office hours	Wednesday 5:00PM to 6:00PM Silberman Library
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	A review of the sources, transportation and control of hazardous chemical wastes. Regulatory requirements, disposal methods and health effects will also be presented.
Course prerequisites	N/A
Course format	A review of the sources, transportation and control of hazardous chemical wastes. Regulatory requirements, disposal methods and health effects will also be presented.
Required reading and resources	See list
Suggested reading and resources	None

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to achieve increased competency in environmental and occupational health science.	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
1. Predict and prevent health, safety and environmental risks from processes, work tasks, environment and other economic and/or social activities.	• Identify and discuss the relevant aspects of hazardous materials management • Describe the regulatory role of the City and State in responding to a hazardous materials release incident • Recognize the principles of Superfund law and apply them to site cleanup and redevelopment. • Identify elements needed to create a site-specific Job Hazard Analysis (JHA) Checklist • Identify components of a site-specific Health and Safety Plan (HASP)	• Discussion Forum • Case Studies • Homework Assignment
2. Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	• Describe the root-causes of select chemical releases and identify federal legislation/enforcement actions to prevent similar future incidents. • Describe how the USEPA, USDOL-OSHA, and the USDOT collaborate to reduce impact of environmental incidents.	• Discussion Forum • Case Studies • Paper
3. Evaluate the human health risks from CBPS hazards using quantitative, qualitative and/or instrumental assessment methods.	• Identify the major elements of a Process Safety management (PSM) inspection • Describe the elements of an effective a Hazard Communication Program	• Discussion Forum • Case Studies • Assignment
4. Recommend appropriate engineering, personal protective or administrative controls and policies for CBPS hazards and evaluate effectiveness.	• Identify controls needed to reduce biological, chemical, and physical hazards at a worksite.	• Class project • Case Studies • Assignment

Required Reading:

1. Wardak, A., Gorman, M. E., Swami, N., & Rejeski, D. (2007). Environmental regulation of nanotechnology and the TSCA. *Technology and Society Magazine, IEEE*, *26*(2), 48-56.

2. Koch, L., & Ashford, N. A. (2006). Rethinking the role of information in chemicals policy: implications for TSCA and REACH. *Journal of Cleaner Production*, *14*(1), 31-46.

3. Bamberger, M., & Oswald, R. E. (2012). Impacts of gas drilling on human and animal health. *New solutions: A Journal of Environmental and Occupational Health Policy*, *22*(1), 51-77.

4. *Emergency Response Guidebook*. (2012). Neenah, WI: JJ Keller.

5. Case, D. (2009). The real story behind bisphenol A. *Fast Company Magazine*, *14*.

6. United States Department of Labor-Occupational Safety and Health Administration. (2012). *Hazard Communication Standard: Labels and Pictograms.* Retrieved from https://www.osha.gov/Publications/OSHA3636.pdf

7. DeMarch, B., Funtowicz, S., & Ravetz, J. Seveso: A Paradox Classic Disaster. Retrieved from http://archive.unu.edu/unupress/unupbooks/uu21le/uu21le09.htm#introduction

8. Schuiling, R. D. (2012). Capturing CO2 from air. *Proceedings of the National Academy of Sciences of the USA*, *109*(20), E1210.

9. Northeast State for Coordinated Air Management. *Pollution Prevention Case Study: Wood Furniture Finishing High Solids Top Coat and Hyper Spray Guns*. Retrieved from http://www.newmoa.org/publications/wood/EACASE.pdf

10. United States Congress. (2002, December 31). *Toxic Substance Control Act*. Retrieved from http://www.epw.senate.gov/tsca.pdf

11. United States Environmental Protection Agency. (1988, September 28). *EPA superfund record of decision love canal*. Retrieved from the Environmental Protection Agency website: http://www.epa.gov/superfund/sites/rods/fulltext/r0285014.pdf

12. United States Environmental Protection Agency (1997, October). *EPA/OSHA Joint Chemical Accident Investigation Report*. Retrieved from http://www.epa.gov/oem/docs/chem/napp.pdf

13. United States Department of Labor- Occupational Safety and Health Administration (2002). *Job Hazard Analysis*. Retrieved from https://www.osha.gov/Publications/osha3071.pdf?utm_source=rss&utm_medium=rss&utm_campaign=job-hazard-analysis-13

14. Ross, G. (2004). The public health implications of polychlorinated biphenyls (PCBs) in the environment. *Ecotoxicology and environmental safety*, *59*(3), 275-291.

Class Project:

Working in groups of 3 to 5, this assignment requires that you select an industry of your choice (eg, steel, paper, organic chemical, health care, etc.) for investigation. In 8-10 pages, describe their production and hazardous waste handling. Also, draw an accompanying schematic that shows the production and the points at which the waste are produced and where the waste goes, that is, how the waste is managed.

Prior to October 7, you must e-mail me your desired topic and your team mates (have one person send me the e-mail, copying the other team mates).

Class project is due on November 25. During week twelve, your group will give a short presentation on your findings.

The written report must include the following:

- Title page (include name, course information, date). The last names of the members MUST be printed in bold, 18 font type on the top right corner of the Cover (first) page.
- Table of Contents page (i.e. list title of paper, contents and tables and figures used in report). Paginate

- Tables, Figures, Illustrations etc. with a write-up for each on the same page using a portrait page setup. Write-up must address the Table/Figure above and provide an interpretation.
- Professional style reference list either at the bottom of each page or as a list at the end.
- Document must be one integrated electronic document. Cut and paste figures into a Word file and paginate as one document. The first T/F should be page one (hint: create a new section).
- Tables/Figures must proceed from general to specific and should temporal and spatial variables. Do not use all graphs or all figures (variety is desired).
- Cite all references using a professional style (i.e. APA or APHA style is strongly recommended)
- No plastic binders/covers; use plain white paper and stapled at the top.
- All pages, except schematics, should be in Portrait format (not landscape) and single spaced. Maximize graphical images.

The group presentation must include the following:

- Every member of the group should be involved in the oral presentation
- Must use electronic media (PowerPoint)
- Presentation should be well organized
- Be prepared to answer questions at the conclusion of the presentation

Presentation Grade:
75% written report
25% oral presentation

Course Assessments
Details about the assignments and grading criteria can be found on the course website

Case Studies: Students will review case studies

Discussion Forum: We will discuss the assigned learning resources. Students are expected to review the materials before class and participate in the discussion.

Class Project: Students will select an industry of their choice for investigation. Working in groups of 3 to 5, students will describe the production and hazardous waste handling in an 8-10 page paper and present their finding as a group presentation (see *class project*).

Exams: Retention and application of course materials are assessed through two exams, that are equally weighed.

Grading

Evaluation criteria
All assignments will be assessed based upon a rubric found on the course website. Specific information about grading criteria will be distributed with the assignment.

The relative weight of each course component is as follows:

Exam #1	25%
Exam #2	25%
Group Project and Presentation	30%
Homework Assignments	15%
Class Participation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
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F	0	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
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Grade appeals
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Course Policies

Attendance and class participation
Expect to actively contribute to the discussion and complete and submit all assignments by posted due dates. Missed assignments or lack of discussion participation not only affect the individual student, but they also affect the class as a whole due to the high degree of interaction within the course.

Late/incomplete submission of assignments
Late or incomplete assignments are not accepted.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students
- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.

- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours.
- Grading and feedback on assignments within 1 week of the due date.
- Communication about grades and progress in the course will be given through the course website.

Accessibility

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Course Schedule
This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings/Resources	Assessment
1	9/2	Course Overview Introduction to Hazardous Materials & Waste Management	5, 7	Discussion
2	9/9	What are hazardous materials (waste)?	1, 11	Discussion Case Study 1
3	9/16	Toxicity/Toxicology 9/16 - Last day to drop without a grade of "W"	2, 6	Discussion
4	9/30	RCRA	12, 14	Discussion
5	10/7	CERCLA and SARA	11	Discussion Case Study 2
6	10/14	USEPA/Enforcement of RCRA	Class hand-out	Discussion Case Study 3
7	10/21	Transportation of Hazardous Materials	4	Discussion Class Exercise
8	10/28	Exam #1		Exam
9	11/4	Process Safety Management (PSM) 11/9 - Last day to withdraw with a grade of 'W'	12	Case Study Case Study 4
10	11/11	Pollution Prevention (P2)	3,8, 9	Discussion Case Study 5
11	11/18	Industrial Hygiene /Worker Safety	13	Case Study 6 Class Exercise
12	11/25	Industrial Hygiene/Worker Safety	13	Case Study 6 Class Exercise
13	12/2	Remedial Techniques-Student Presentation	13	Student Presentations
14	12/9	Industrial Hygiene/Worker Safety	13	Case Study 6 Class Exercise
15	12/16	Exam #2		Exam

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
EPI 75500 Epidemiology of Chronic Diseases
3 Credits
Fall 2015

Time and location	8:00-9:45pm Silberman, C05
Instructor	C Mary Schooling, PhD Email: mschooli@hunter.cuny.edu Phone: mschooli@hunter.cuny.edu
Office hours	Tuesday, 4-6pm Room 545, 2180 Third Avenue, New York or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course provides students with epidemiological background information for the most common chronic disease conditions. In addition, the course provides students with hands on experience to characterize the frequency and impact of chronic diseases and their risk factors in New York City (NYC) using public data available through the Department of Health and Mental Hygiene.
Course prerequisites	PH 75000/PH 75100 and PH 75200/PH 75300
Course format	Lectures
Required reading and resources	
Suggested reading and resources	Please see course schedule for week by week readings

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the core functions of PH practice (assessment, policy development, and assurance)	1. Describe the burden of chronic diseases, nationally and globally 2. Describe global policy action on chronic diseases 3. Describe issues with the assessment of chronic disease burden 4. Place chronic diseases within a temporal and geo-ethnic context	1. Reaction paper 1 2. Reaction paper 2 3. Reaction paper 1 4. Reaction papers 3, 4 and 5
Understand basic theories, concepts, models and methods from a range of core and related disciplines	1. Identify risk factors associated with specific chronic diseases 2. Describe the etiology of chronic diseases and identify any gaps	1. Reaction paper 6 2. Reaction paper 7
Interpret and apply the PH literature	1. Read and critique epidemiologic and other public health literature effectively 2. Draw appropriate inferences from epidemiologic data, using established principles and guidelines 3. Identify primary and secondary prevention strategies for these diseases.	1. Paper Introduction 2. Paper Discussion 3. Reaction papers 8, 9,10,11,12,13
Communicate PH information verbally and in writing	1. Summarize the evidence concerning a major modifiable risk factor for a key non-communicable disease	1. Paper Results

Course Assessments

This course will be assessed based on reaction papers (13), a paper, a presentation and participation. The reaction paper should synthesize and critically evaluate key theoretical, methodological and/or substantive contributions of the readings, along with a few questions for clarification and discussion. This may consist of identifying questions that the readings provoke; critiquing problematic assumptions, logic, and measurement; discussing theoretical and empirical advances; and considering ideas for future directions. Please reference all statements of fact. Please format as single-spaced, typed, 12-point Times Roman font with 1-inch margins. Each presentation should last about 10 minutes.

The paper will be a manuscript. Students will work on the sections of the manuscript in steps: (1) topic description (no more than 2 pages), (2) introduction (2 pages) (3) methods (3 pages) (4) results (no more than 5 pages) (5) Discussion (5 pages). Complete paper (no more than 15 pages, excluding references and tables). At each step, students will turn in to the instructor and their fellow students the written document to receive feedback. Students should be considerate in giving feedback to their colleagues, and can do so either orally or by writing comments. Please reference all statements of fact. Each section of the paper, as well as the final completed paper, will be assigned a numeric grade by the instructor. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

Grading

Evaluation criteria

In general reaction papers, the paper and the presentation will be evaluated according to their demonstration of a) grasp of the topic, b) identification of the key points, c) synthesis of the material, and d) explanation of the implications for practice. Participation will be evaluated according to contribution to the discussion.

Grading rubrics for the assessments

GRADING RUBRICS	(A+ to A-)	(B+ to B-)	(C+ to C)	(F)
Reaction papers, paper and presentation	Provides a comprehensive and critical synthesis of the topic with appropriate examples and discussion of their implications	Identifies the implications of the key points in the topic, provides some critical apprasial	Describes the main topic	Inability to identify and describe the main topic

The relative weight of each course component is as follows:

Assessment	Weight
Reaction papers 13	39%
Topic description	5%
Introduction	10%
Methods	10%
Results	10%
Discussion	10%
Presentation	15%
Participation	6%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
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Course Policies

Attendance and class participation

All members of the class are expected to actively participate in class activities and discussions, and to complete assigned reading prior to class. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible.

Late/incomplete submission of assignments

All assignments must be submitted via blackboard by 4PM on the day of the class. It is expected that your writing will be of graduate-level quality, presented in a readable and consistent manner. Assignments handed in after the due date without prior permission may not be accepted. If you anticipate the need to turn in work late, please contact me to negotiate a mutually acceptable submission plan in advance of the assignment's due date. Please do not ask for an extension on the due date of the assignment.

Make-ups, rewrites, and extra credit

Rewrites are permitted for reaction papers.

Last Updated July 23, 2015

Expectations of students

Students are required to attend each class, as participation in the discussion is essential to understanding the existing evidence on the topic and drawing judgments. In the case of illness, students should email me the day of class. In the case of unavoidable absence (e.g. work related conference), students should email me one week prior to the class. Students should prepare adequately for class, and participate appropriately. Appropriate participation includes:

- Active listening
- Building on what others say
- Staying focused on the topic of the session
- Clarifying the assumptions underlying opinions/statements
- Using the readings and epidemiologic ideas to develop arguments
- Constructively challenging the ideas of others, rather than accepting statements that are inadequately supported
- Allowing others to request explanation when needed
- Coming prepared, rather than relying on the group to explain difficult topics

Expectations for the instructor

Students can expect the instructor to provide access to the week-by-week readings (on blackboard), to provide substantial background information at each session as powerpoints available shortly after each session, and to facilitate discussion. Students can expect reaction papers to be graded within 1 week and other assignments to be graded within 2 weeks.

Accessibility

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Course Schedule

This schedule & assignments are subject to change throughout the semester. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. Opportunities for group work will be scheduled during some sessions.

Session	Date	Topic	Readings	Assignment Due
1	**27 Aug**	Global burden of disease	1. GBD 2013 Mortality and Causes of Death Collaborators. . Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2015 Jan 10;385(9963):117-71 2. Global Burden of Disease Study 2013 Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013.Lancet. 2015 Jun 7. pii: S0140-6736(15)60692-4. doi: 10.1016/S0140-6736(15)60692-4 3. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. Int J Cancer. 2010 Jun 17. 4. Cowie CC, Rust KF, Byrd-Holt DD, Gregg EW, Ford ES, Geiss LS, Bainbridge KE, Fradkin JE. Prevalence of diabetes and high risk for diabetes using A1C criteria in the U.S. population in 1988-2006. Diabetes Care. 2010 Mar;33(3):562-8 5. Agarwal R, Norton JM, Konty K, Zimmerman R, Glover M, Lekiachvili A, McGruder H, Malarcher A, Casper M, Mensah GA, Thorpe L. Overreporting of deaths from coronary heart disease in New York City hospitals, 2003. Prev Chronic Dis. 2010 May;7(3):A47	Reaction paper 1 Describe the burden of major chronic diseases globally and locally
2	**3 Sept**	Millenium Development goals (MDGs)and the Sustainiable Development Goals (SDGs)	1. https://sustainabledevelopment.un.org/focussdgs.html 2. http://www.un.org/millenniumgoals/ 3. Lomazzi M, Laaser U, Theisling M, Tapia L, Borisch B. 4. Millennium Development Goals: how public health professionals perceive the achievement of MDGs. Glob Health Action. 2014 Sep 22;7:24352. 5. Sachs JD From millennium development goals to sustainable development goals. Lancet. 2012 Jun 9;379(9832):2206-11.	Reaction paper 2 Compare and contrast the MDGs with the SDGs
3	**17 Sept**	Epidemiological transition and chronic diseases	1. Omran AR. The epidemiologic transition. A theory of the Epidemiology of population change. 1971. Bull World Health Organ. 2001;79(2):161-70 2. Gaziano JM. Fifth phase of the epidemiologic transition: the age of obesity and inactivity. JAMA. 2010 Jan 20;303(3):275-6 3. Normile D. A sense of crisis as China confronts ailments of affluence. Science. 2010 Apr 23;328(5977):422-4 4. Yang S, Khang YH, Harper S, Davey Smith G, Leon DA, Lynch J. Understanding the rapid increase in life expectancy in South Korea. Am J Public Health. 2010 May;100(5):896-903	Reaction paper 3 Describe the epidemiological transition and identify countries at different stages Paper – Topic Description
4	**24 Sept**	Secular trends in selected chronic diseases	1. Lawlor DA, Ebrahim S, Davey Smith G. Sex matters: secular and geographical trends in sex differences in coronary heart disease mortality. BMJ. 2001 Sep 8;323(7312):541-5 2. Lawlor DA, Smith GD, Leon DA, Sterne JA, Ebrahim S. Secular trends in mortality by stroke subtype in the 20th century: a retrospective analysis. Lancet. 2002 Dec 7;360(9348):1818-	Reaction paper 4 Describe trends in major chronic diseases

			23 3. Zhao D, Liu J, Wang W, Zeng Z, Cheng J, Liu J, Sun J, Wu Z. Epidemiological transition of stroke in China: twenty-one-year observational study from the Sino-MONICA-Beijing Project. Stroke. 2008 Jun;39(6):1668-74 4. Nikiforov SV, Mamaev VB (1998) The development of sex differences in cardiovascular disease mortality: a historical perspective. Am J Public Health 88: 1348–1353. *5.* Gale EA, Gillespie KM (2001) Diabetes and gender. Diabetologia 44: 3–15 6. Savu A, Potter J, Li S, Yasui Y. Breast cancer and microbial cancer incidence in female populations around the world: a surprising hyperbolic association. Int J Cancer. 2008 Sep 1;123(5):1094-9.	
5	**1 Oct**	Geo-ethnic differences in selected chronic diseases	1. Yang W, Lu J, Weng J et al. Prevalence of diabetes among men and women in China. *N Engl J Med.*2010;362(12):1090-1101. ***2.*** Stirbu I, Kunst AE, Bos V, Mackenbach JP. Differences in avoidable mortality between migrants and the native Dutch in The Netherlands. BMC Public Health 2006; 6:78.): 78. 3. Ahmad N, Bhopal R. Is coronary heart disease rising in India? A systematic review based on ECG defined coronary heart disease. *Heart.* 2005;91(6):719-725. 4. Howe HL, Lake A, Schymura MJ, Edwards BK. Indirect method to estimate specific Hispanic group cancer rates. Cancer Causes Control. 2009 Sep;20(7):1215-26. 5. Jemal A, Center MM, DeSantis C, Ward EM., Global patterns of cancer incidence and mortality rates and trends. Cancer Epidemiol Biomarkers Prev. 2010 Aug;19(8):1893-907 6. Zhang XH, Lu ZL, Liu L. Coronary heart disease in China. Heart. 2008 Sep;94(9):1126-31	Reaction paper 5
6	**8 Oct**	Risk stratification	1. Capewell S, Hayes DK, Ford ES, Critchley JA, Croft JB, Greenlund KJ, Labarthe DR. Life-years gained among US adults from modern treatments and changes in the prevalence of 6 coronary heart disease risk factors between 1980 and 2000. Am J Epidemiol. 2009 Jul 15;170(2):229-36 2. Hajifathalian K et al, A novel risk score to predict cardiovascular disease risk in national populations (Globorisk): a pooled analysis of prospective cohorts and health examination surveys. Lancet Diabetes Endocrinol. 2015 May;3(5):339-55. 3. Ford ES, Will JC, Mercado CI, Loustalot F. Trends in predicted risk for atherosclerotic cardiovascular disease using the pooled cohort risk equations among US adults from 1999 to 2012. JAMA Intern Med. 2015 Feb;175(2):299-302 4. Grill S, Fallah M, Leach RJ, Thompson IM, Hemminki K, Ankerst DP. A simple-to-use method incorporating genomic markers into prostate cancer risk prediction tools facilitated future validation. J Clin Epidemiol. 2015 May;68(5):563-73.	Reaction paper 6 Paper - Introduction
7	**15 Oct**	Etiology	1. Marmot MG, Syme SL, Kagan A, Kato H, Cohen JB, Belsky J. Epidemiologic studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii and California: prevalence of coronary and hypertensive heart disease and associated risk factors. Am J Epidemiol. 1975 Dec;102(6):514-25. 2. Ezzati M, Obermeyer Z, Tzoulaki I, Mayosi BM, Elliott P, Leon DA. Contributions of risk factors and medical care to cardiovascular mortality trends. *Nat Rev Cardiol* 2015 3. Taşan M, Musso G, Hao T, Vidal M, MacRae CA, Roth FP. Selecting causal genes from genome-wide association studies via functionally coherent subnetworks. Nat Methods. 2015 Feb;12(2):154-9.	Reaction Paper 7
8	**22 Oct**	Does Obesity matter?	1. Flegal KM, Graubard BI, Williamson DF, Gail MH. Cause-specific excess deaths associated with underweight, overweight, and obesity. JAMA. 2007 Nov 7;298(17):2028-37. 2. Schooling CM, Lam TH, Li ZB, Ho SY, Chan WM, Ho KS, Tham MK, Cowling BJ, Leung GM. Obesity, physical activity, and mortality in a prospective chinese elderly cohort. Arch Intern	Reaction Paper 8

			Med. 2006 Jul 24;166(14):1498-504 3. Su D. Body mass index and old-age survival: a comparative study between the Union Army Records and the NHANES-I Epidemiological Follow-Up Sample. Am J Hum Biol. 2005 May-Jun;17(3):341-54 4. Davey Smith G, Sterne JA, Fraser A, Tynelius P, Lawlor DA, Rasmussen F. The association between BMI and mortality using offspring BMI as an indicator of own BMI: large intergenerational mortality study. BMJ. 2009 Dec 22;339	
9	**29 oct**	Is moderate alcohol use protective?	1. Doll R, Peto R, Boreham J, Sutherland I. Int J Epidemiol. 2005 Feb;34(1):199-204. Mortality in relation to alcohol consumption: a prospective study among male British doctors. 2. Naimi TS, Brown DW, Brewer RD, Giles WH, Mensah G, Serdula MK, Mokdad AH, Hungerford DW, Lando J, Naimi S, Stroup DF. Cardiovascular risk factors and confounders among nondrinking and moderate-drinking U.S. adults. Am J Prev Med. 2005 May;28(4):369-73 3. Howard AA, Arnsten JH, Gourevitch MN. Effect of alcohol consumption on diabetes mellitus: a systematic review. *Ann Intern Med.* 2004;140:211-219 4. Zilkens RR, Burke V, Watts G, Beilin LJ, Puddey IB. The effect of alcohol intake on insulin sensitivity in men: a randomized controlled trial. *Diabetes Care.* 2003;26:608-612 5. Holmes MV et al, Association between alcohol and cardiovascular disease: Mendelian randomisation analysis based on individual participant data. BMJ. 2014 Jul 10;349:g4164.	Reaction Paper9 Paper - Methods
10	**5 Nov**	What about supplements (vitamins, minerals, hormones)?	1. Lawlor DA. The HRT story: are there any benefits? Int J Epidemiol. 2003 Oct;32(5):897-8 2. Knekt P, Ritz J, Pereira MA, O'Reilly EJ, Augustsson K, Fraser GE, Goldbourt U, Heitmann BL, Hallmans G, Liu S, Pietinen P, Spiegelman D, Stevens J, Virtamo J, Willett WC, Rimm EB, Ascherio A, Antioxidant vitamins and coronary heart disease risk: a pooled analysis of 9 cohorts. Am J Clin Nutr. 2004 Dec;80(6):1508-20. 3. Bjelakovic G, Nikolova D, Gluud C. Antioxidant supplements and mortality. Curr Opin Clin Nutr Metab Care. 2014 Jan;17(1):40-4. 4. Reid IR, Bristow SM, Bolland MJ. Calcium supplements: benefits and risks. J Intern Med. 2015 Jul 14. 5. Khaw KT, Dowsett M, Folkerd E et al. Endogenous testosterone and mortality due to all causes, cardiovascular disease, and cancer in men: European prospective investigation into cancer in Norfolk (EPIC-Norfolk) Prospective Population Study. *Circulation.* 2007;116(23):2694-2701. 6. Basaria S, Coviello AD, Travison TG et al. Adverse Events Associated with Testosterone Administration. *N Engl J Med.* 2010.	Reaction Paper 10 Paper - Results
11	**12 Nov**	What is a healthy diet?	1. KEYS A., Prediction and possible prevention of coronary disease. Am J Public Health Nations Health. 1953 Nov;43(11):1399-1407 2. Boffetta P, et al Fruit and vegetable intake and overall cancer risk in the European Prospective Investigation into Cancer and Nutrition (EPIC). J Natl Cancer Inst. 2010 Apr 21;102(8):529-37. 3. Measurement Error of Dietary Self-Report in Intervention Trials. Natarajan L, Pu M, Fan J, Levine RA, Patterson RE, Thomson CA, Rock CL, Pierce JP. Am J Epidemiol. 2010 Aug 18. 4. Price GM, Paul AA, Cole TJ, Wadsworth ME. Characteristics of the low-energy reporters in a longitudinal national dietary survey. Br J Nutr. 1997 Jun;77(6):833-51. 5. Foster GD, Wyatt HR, Hill JO, Makris AP, Rosenbaum DL, Brill C, Stein RI, Mohammed BS, Miller B, Rader DJ, Zemel B, Wadden TA, Tenhave T, Newcomb CW, Klein S. Weight and metabolic outcomes after 2 years on a low-carbohydrate versus low-fat diet: a randomized	Reaction Paper 11 Paper - Discussion

			trial. Ann Intern Med. 2010 Aug 3;153(3):147-57. 6. Dietary Guidelines for Americans 2015	
12	**19 Nov**	Student presentations -		
13	**3 Dec**	Lay epidemiology	1. Hunt K, Emslie C. Commentary: the prevention paradox in lay epidemiology--Rose revisited. Int J Epidemiol. 2001 Jun;30(3):442-6. 2. Frankel S, Davison C, Smith GD. Br J Gen Pract. 1991 Oct;41(351):428-30. Lay epidemiology and the rationality of responses to health education. 3. Schlomann P, Schmitke J. Lay beliefs about hypertension: an interpretive synthesis of the qualitative research. J Am Acad Nurse Pract. 2007 Jul;19(7):358-67. 4. Tong EK, Glantz SA. Tobacco industry efforts undermining evidence linking secondhand smoke with cardiovascular disease. Circulation. 2007 Oct 16;116(16):1845-54. 5. Brownell KD, Warner KE. The perils of ignoring history: Big Tobacco played dirty and millions died. How similar is Big Food? Milbank Q. 2009 Mar;87(1):259-94 6. Kuper H, Nicholson A, Kivimaki M, Aitsi-Selmi A, Cavalleri G, Deanfield JE, Heuschmann P, Jouven X, Malyutina S, Mayosi BM, Sans S, Thomsen T, Witteman JC, Hingorani AD, Lawlor DA, Hemingway H. Evaluating the causal relevance of diverse risk markers: horizontal systematic review. BMJ. 2009 Nov 5;339:b4265.	Reaction Paper 12
14	**10 Dec**	Prevention strategies	1. TW Hu, Z Mao, J Shi, et al, The role of taxation in tobacco control and its potential economic impact in China, Tob Control 2010 19: 58-64. 2. Hopkins DP et al, Smokefree Policies to Reduce Tobacco Use A Systematic Review 3. Am J Prev Med 2010;38(2S):S275–S289 4. Melanie A Wakefield, Barbara Loken, Robert C Hornik, Use of mass media campaigns to change health behaviour, Lancet 2010; 376: 1261–71 5. West R et al, Behavior change techniques used by the English Stop Smoking Services and their associations with short-term quit outcomes, Nicotine & Tobacco Research, Volume 12, Number 7 (July 2010) 742–747	Reaction Paper 13
15	**17 Dec**	Policy Implications and Conclusions		Final Paper Due

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
EPI 77005: Epidemiological Methods IV
Credits:3
Fall 2015

Time and location	6:30 – 8:30 pm, GC, Room 3317
Instructor	C Mary Schooling, PhD Email: mschooli@hunter.cuny.edu Phone: mschooli@hunter.cuny.edu
Office hours	Tuesday, 4-6pm Room 545, 2180 Third Avenue, New York or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This seminar is intended to help students integrate the concepts and methods of epidemiologic research with specific inquiry directed at understanding and improving the health of urban populations. This seminar requires students to develop proposals for epidemiologic research, identify strategies for data analysis that incorporate the lessons learned in Epidemiology Methods courses, and to examine the application of those strategies to existing research. This course helps to "bring together" the epidemiology theory and methods that have been discussed throughout the rest of curriculum.
Course prerequisites	EPI 75000/77000 or PUBH 82200 (CUNY Graduate Center)
Course format	Lectures and seminar
Required reading and resources	Modern Epidemiology, Rothman, Lash & Greenland, Lippincott Williams & Wilkins J Pearl, Causality, Models, Reasoning, and Inference Cambridge University Press
Suggested reading and resources	Please see course schedule for week by week readings

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	1. Describe the strengths, weaknesses and inconsistencies of the prevailing methodological paradigm in epidemiology. a. Explain the role of risk factors in DAGs 2. Discuss the role of science in epidemiology 3. Distinguish between methods aimed at description, risk stratification and causal inference 4. Explain the value of representativeness for each question 5. Explain the difference between operationalizing a research question in existing data and designing a study to answer a particular research question	1. Reaction paper 1, 2 2. Reaction paper 2 3. Session 3 discussion, reaction paper 4 and practical 1 4. Reaction paper 3 5. Research proposal
Critically read and evaluate the strengths and limitations of epidemiologic literature from a methodologic perspective	6. Interpret a meta-analysis, explain the relevance to interpretation of a single study 7. Summarize and present data to peers 8. Identify possible reasons for conflicting results across published quantitative studies. 9. Place instrumental variable studies and natural experiments, including discontinuities, within the pyramid of evidence. Describe how to conduct and interpret such studies. 10. Recap on the biases to which traditional observational studies are open and explain the different ways of addressing them, such as propensity scores and inverse probability weighting 11. Determine what further work is needed to adequately answer a research question and make public health/health decisions.	6. Reaction paper 7. Presentation 1 and 2 8. Paper 1 9. Session 12 and Practical 2 10. Reaction paper 6 11. Reaction paper 8 12. Reaction paper 9 13. Research proposal
Identify key threats to validity (internal and external) within and across epidemiologic studies	12. Compare and contrast research findings, and make public health decisions based on available evidence, even if it is incomplete. 13. Compare and contrasts the use of experimental vs. observational study designs	14. Paper 2 15. Reaction paper 5
Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	16. Interpret a marginal structural model 17. Explain the use of g-estimation	16. Reaction paper 8 17. Reaction paper 9

Course Assessments

This course will be assessed based on reaction papers (9), papers (2), practicals (2), a proposal and participation. The reaction paper should synthesize and critically evaluate key theoretical, methodological and/or substantive contributions of the readings, along with a few questions for clarification and discussion. This may consist of identifying questions that the readings provoke; critiquing problematic assumptions, logic, and measurement; discussing theoretical and empirical advances; and considering ideas for future directions. The papers should give a thorough exposition of the topic with particular attention to the interpretation of any findings and the implications for public health. The proposal should be in NIH format. Please reference all statements of fact. Please format as single-spaced, typed, 12-point Times Roman font with 1-inch margins. Expected length is 1-2 pages for reaction papers and 5-10 pages for papers and the proposal. Each presentation should last about 10 minutes.

Grading

Evaluation criteria

In general papers and presentation will be evaluated according to their demonstration of a) grasp of the topic, b) identification of the key points, c) synthesis of the material, and d) explanation of the implications for practice. Participation will be evaluated according to contribution to the discussion. Practicals will be evaluated against a standard answer.

Grading rubrics for the assessments

GRADING RUBRICS	(A+ to A-)	(B+ to B-)	(C+ to C)	(F)
Reaction papers, papers, presentations	Provides a comprehensive synthesis of the topic with appropriate examples and discussion of their implications for practice	Identifies the implications of the key points in the topic, provides some examples and relevance to practise	Describes the main concepts in the topic	Inability to identify and describe the main concepts

The relative weight of each course component is as follows:

Assessment	Weight
Reaction papers 9	27%
Practicals 2	15%
Presentation 2	10%
Papers 2	18%
Participation	5%
Proposal	20%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9

B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

All members of the class are expected to actively participate in class activities and discussions, and to complete assigned reading prior to class. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible.

Late/incomplete submission of assignments

All assignments must be submitted to me via blackboard by 4PM on the day of the class. It is expected that your writing will be of graduate-level quality, presented in a readable and consistent manner: 1.5-spaced, typewritten, with one-inch margins all around and proofread. Assignments handed in after the due date without prior permission may not be accepted. If you anticipate the need to turn in work late, please contact me to negotiate a mutually acceptable submission plan in advance of the assignment's due date. Please do not ask for an extension on the due date of the assignment.

Make-ups, rewrites, and extra credit

Rewrites are permitted for reaction papers.

Expectations of students

Students are required to attend each class, as participation in the discussion is essential to understanding the existing evidence on the topic and drawing judgments. In the case of illness, students should email me the day of class. In the case of unavoidable absence (e.g. work related conference), students should email me one

week prior to the class. Students should prepare adequately for class, and participate appropriately. Appropriate participation includes:

- Active listening
- Building on what others say
- Staying focused on the topic of the session
- Clarifying the assumptions underlying opinions/statements
- Using the readings and epidemiologic ideas to develop arguments
- Constructively challenging the ideas of others, rather than accepting statements that are inadequately supported
- Allowing others to request explanation when needed
- Coming prepared, rather than relying on the group to explain difficult topics

Expectations for the instructor

Students can expect the instructor to provide access to the week-by-week readings (on blackboard), to provide substantial background information at each session (apart from practicals) as powerpoints available shortly after each session, and to facilitate discussion. Students can expect reaction papers to be graded within 1 week and other assignments to be graded within 2 weeks.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

This schedule & assignments are subject to change throughout the semester. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. Opportunities for group work will be scheduled during some sessions.

Session	Date	Topic	Readings	Assignment Due
1	**28 Aug**	Current paradigms in epidemiology – the dispute	1. Chapter 1, Modern Epidemiology, Rothman, Lash & Greenland 2. Chapter 1, Causality, Pearl 3. https://epiresearch.org/about-us/archives/video-archives-2/the-scientific-approach-to-causal-inference/ 4. Int J Epidemiol. 1975 Sep;4(3):159-68. Popper's philosophy for epidemiologists. Buck C. 5. Am J Epidemiol. 2012 Dec 15;176(12):1071-7. Stories from the evolution of guidelines for causal inference in epidemiologic associations: 1953-1965. Blackburn H, Labarthe D.	Reaction paper 1 Identify the major differences between the approach of Pearl compared with that of Rothman and Rubin
2	**1 Sept**	Current paradigms in epidemiology – the implications	1. Chapter 1, Modern Epidemiology, Rothman, Lash & Greenland 2. Chapter 1, Causality, Pearl **3.** Phillips CV, Goodman KJ. Causal criteria and counterfactuals; nothing more (or less) than scientific common sense. Emerg Themes Epidemiol. 2006 May 26;3:5. 4. Pearl J, On the consistency rule in causal inference: axiom, definition, assumption, or theorem? .Epidemiology. 2010 Nov;21(6):872-5. 5. Cole SR, Frangakis CE. The consistency statement in causal inference: a definition or an assumption? Epidemiology. 2009 Jan;20(1):3-5.	Reaction paper 2 Describe the implications of the differences between these approaches
3	**8 Sept**	Data generating models and DAGs	1. Chapter 1, Causality, Pearl 2. Series on representativeness in August 2013 IJE and responses in Jan 2014	Reaction paper 3 1. Give an example of a data generating model and explain how to test it 2. Explain how risk factors relate to DAGs 3. Explain when representativeness is required for testing a model
4	**29 Sept**	Model generation The problem of induction, does big data help?	1. Andrew Gelman, Guido Imbens, Why ask Why? Forward Causal Inference and Reverse Causal Questions, NBER Working Paper No. 19614, Issued in November 2013 The problem of induction, does big data help? 2. Jordan B.Genes and non-mendelian diseases: dealing with complexity. Perspect Biol Med. 2014 Winter;57(1):118-31.	Reaction paper 4. 1. What is the difference between causes of effects and effects of causes 2. How does big data help us address these questions
5	**6 Oct**	Model generation EWAS and GWAS	1. Patel CJ, Rehkopf DH, Leppert JT, Bortz WM, Cullen MR, Chertow GM, Ioannidis JP Systematic evaluation of environmental and behavioural factors associated with all-cause mortality in the United States National Health and Nutrition Examination Survey. Int J Epidemiol. 2013 Dec;42(6):1795-810 2. Patel CJ, Cullen MR, Ioannidis JP, Butte AJ. Int J Epidemiol. 2012 Jun;41(3):828-43.	Reaction paper 5 What can we learn from EWAS and GWAS?

			Systematic evaluation of environmental factors: persistent pollutants and nutrients correlated with serum lipid levels. 3. Int J Epidemiol. 2012 Jun;41(3):843-6.Commentary: a step towards more comprehensive analyses of life course effects of mixtures of environmental factors. Porta M, Gasull M, Pumarega J. 4. Pendergrass SA, Verma A, Okula A, Hall MA, Crawford DC, Ritchie MD. Phenome-Wide Association Studies: Embracing Complexity for Discovery. Hum Hered. 2015;79(3-4):111-23.	
6	**13 Oct**	EWAS practical		Prepare data for use in practical
7	**20 Oct**	BMI and mortality	1. Association of all-cause mortality with overweight and obesity using standard body mass index categories: a systematic review and meta-analysis. Flegal KM, Kit BK, Orpana H, Graubard BI.JAMA. 2013 Jan 2;309(1):71-82 2. Obesity, physical activity, and mortality in a prospective chinese elderly cohort. Schooling CM, Lam TH, Li ZB, Ho SY, Chan WM, Ho KS, Tham MK, Cowling BJ, Leung GM. Arch Intern Med. 2006 Jul 24;166(14):1498-504. 3. Flegal KM et al.Reverse causation and illness-related weight loss in observational studies of body weight and mortality. Am J Epidemiology 2011;173(1):1-9. 4. Cooper RS. Which factors confound or modify the relationship between body weight and mortality? Int J Obesity 2008; 32:S47-S51. 5. Zajacova A et al. Overweight adults have the lowest mortality: do they have the best health? Am J Epidemiology 2011;173:430-437. 6. Alley DE et al. Changes in weight at the end of life: characterizing weight loss by time to death in a cohort study of older men. Am J Epidemiology 2010;172:558-565. 7. BMJ. 2009 Dec 22;339:b5043. The association between BMI and mortality using offspring BMI as an indicator of own BMI: large intergenerational mortality study. Davey Smith G, Sterne JA, Fraser A, Tynelius P, Lawlor DA, Rasmussen F. **8.** Flanders WD, Eldridge RC, McClellan W. Epidemiology. 2014 Sep;25(5):762-4. A nearly unavoidable mechanism for collider bias with index-event studies.	Practical results 1 (EWAS) Paper 1: BMI and mortality
8	**27 Oct**	Causal inference from observational evidence	1. Tatsioni A, Bonitsis NG, Ioannidis JP. Persistence of contradicted claims in the literature ***JAMA***. 2007 Dec 5;298(21):2517-26.. 2. Benson K., Hartz A.J. A comparison of observational studies and randomized, controlled trials. ***N Engl J Med*** 2000; **342**:1878-1886. 3. Concato J., Shah N., Horwitz R.I. Randomized, controlled trials, observational studies, and the hierarchy of research designs. ***N Engl J Med*** 2000; **342**:1887-1892. 4. Prasad V., Jorgenson J., Ioannidis J.P., Cifu A. Observational studies often make clinical practice recommendations: an empirical evaluation of authors' attitudes***. J Clin Epidemiol*** 2013; **66**:361-366. 5. Pearl J. Invited commentary: understanding bias amplification. Am J Epidemiol. 2011 Dec 1;174(11):1223-7; 6. Austin PC, Stuart EA. Moving towards best practice when using inverse probability of treatment weighting (IPTW) using the propensity score to estimate causal treatment effects in observational studies. Stat Med. 2015 Aug 3.	Presentation 1 Present an example where observational evidence was refuted by experimental evidence. Explain specifically how the discrepancy between these different sources of evidence arose (do not use HRT as an example)
9	**3 nov**	Instrumental variable analysis	1. Swanson SA, Hernán MA. Commentary: how to report instrumental variable analyses (suggestions welcome). Epidemiology. 2013 May;24(3):370-4.	Reaction paper 6: How does IV analysis compare with

			2. VanderWeele TJ1, Tchetgen Tchetgen EJ, Cornelis M, Kraft P.Methodological challenges in mendelian randomization. Epidemiology. 2014 May;25(3):427-35.	conventional regression?
10	**10 Nov**	MR practical	1. Burgess S, Scott RA, Timpson NJ, Davey Smith G, Thompson SG; EPIC- InterAct Consortium.Using published data in Mendelian randomization: a blueprint for efficient identification of causal risk factors. Eur J Epidemiol. 2015 Jul;30(7):543-52. 2. Ahmad OS et al. A Mendelian randomization study of the effect of type-2 diabetes on coronary heart disease. Nat Commun. 2015 May 28;6:7060.	Prepare data for use in practical
11	**17 Nov**	Interpreting the observational evidence, natural experiments and discontinuities	1. Callaghan RC, Sanches M, Gatley JM Impacts of the minimum legal drinking age legislation on in-patient morbidity in Canada, 1997-2007: a regression-discontinuity approach. Addiction. 2013 Sep;108(9):1590-600 2. Albouy V, Lequien L.. Does compulsory education lower mortality? J Health Econ. 2009 Jan;28(1):155-68 3. Aidan G O'Keeffe, Sara Geneletti, Gianluca Baio, Linda D Sharples, Irwin Nazareth, and Irene Petersen, Regression discontinuity designs: an approach to the evaluation of treatment efficacy in primary care using observational data, BMJ sept 2014	Practical results (MR)
12	**24 Nov**	Meta-analysis and the pyramid of evidence	1. Umscheid CA Clin Infect Dis. 2013 Sep;57(5):725-34. A Primer on Performing Systematic Reviews and Meta-analyses.. 2. Tugwell P, Judd MG, Fries JF, Singh G, Wells GA: Powering our way to the elusive side effect: a composite outcome 'basket' of predefined designated endpoints in each organ system should be included in all controlled trials. J Clin Epidemiol 2005, 58:785–790. 3. Gøtzsche PC1, Ioannidis JP Content area experts as authors: helpful or harmful for systematic reviews and meta-analyses?. BMJ. 2012 Nov 1;345:e7031. 4. Ioannidis JP, Chang CQ, Lam TK, Schully SD, Khoury MJ. The geometric increase in meta-analyses from China in the genomic era. PLoS One. 2013 Jun 12;8(6):e65602. 5. Doshi P1, Dickersin K, Healy D, Vedula SS, Jefferson T. Restoring invisible and abandoned trials: a call for people to publish the findings. BMJ. 2013 Jun 13;346:f2865	Paper 2: Describe a healthy diet
13	**1 Dec**	Marginal structural models	1. Suarez D1, Borràs R, Basagaña X..Differences between marginal structural models and conventional models in their exposure effect estimates: a systematic review. Epidemiology. 2011 Jul;22(4):586-8 2. Neophytou AM, Costello S, Brown DM, Picciotto S, Noth EM, Hammond SK, Cullen MR, Eisen EA. Marginal Structural Models in Occupational Epidemiology: Application in a Study of Ischemic Heart Disease Incidence and PM2.5 in the US Aluminum Industry. Am J Epidemiol. 2014 Sep 15;180(6):608-15 3. Chen PL, Cole SR, Morrison CS. Epidemiology. 2011 Nov;22(6):877-8. Hormonal contraception and HIV risk: evaluating marginal-structural-model assumptions.	Reaction paper 8: Describe the strengths and weaknesses of MSM
14	**8 Dec**	G estimation	1. Keil AP, Richardson DB, Troester MA., Healthy worker survivor bias in the Colorado Plateau uranium miners cohort., Am J Epidemiol. 2015 May 15;181(10):762-70. 2. Joffe MM. Structural nested models, g-estimation, and the healthy worker effect: the promise (mostly unrealized) and the pitfalls. Epidemiology. 2012 Mar;23(2):220-2. 3. Chevrier J, Picciotto S, Eisen EA. A comparison of standard methods with g-estimation of accelerated failure-time models to address the healthy-worker survivor effect: application in a cohort of autoworkers exposed to metalworking fluids. Epidemiology. 2012 Mar;23(2):212-9.	Reaction paper 9: Describe the strengths and weaknesses of g-estimation
15	**15 Dec**	Proposal presentation		Presentation 2 Present research proposal Research proposal

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

Brooklyn College

HNSC 7110X

FUNDAMENTALS OF SOCIAL AND BEHAVIORAL HEALTH

FALL 2015
3 credits

Catalogue description: This course provides a topical and theoretical survey of social and behavioral issues in public health

Course meets: Fully online

Instructor: Professor Michele Greene, DrPH

Email: MGGreene@brooklyn.cuny.edu

Phone: 718-951-5000 ext. 2756 Please do NOT leave voicemail.

Office: 4109 Ingersoll Hall (referred to by building code IH or N)

Office Hours at Brooklyn College: 7:30 - 9:00 AM, Tuesday and Thursday

10:45 AM – 1:00 PM Tuesday and Thursday*

*Please note that on some Tuesdays and Thursdays I may not be available during these office hours because of meetings. If you plan to come in, please arrange a specific appointment time via email.

Required books: NA

Required materials: Required readings and assigned materials are posted on Blackboard.

This is an asynchronous, fully online course. This means that, as with a traditional class, you are responsible for weekly readings and activities. Unlike a traditional class, you are expected to independently access and view PowerPoint presentations when available, and to participate in online Discussion Boards (DB), as well as to complete activities and take exams online.

It is **YOUR** responsibility to successfully log onto Blackboard and participate in the course throughout the semester. If you need assistance, Brooklyn College's Information Technology Systems (ITS) Help Desk can be accessed by calling 718-677-6180 (9am-5pm), emailing helpdesk@brooklyn.cuny.edu or visiting http://dewey.brooklyn.cuny.edu/resources/index.php?#computing

The online technical components of the class will NOT be managed by the course instructor.

BB refers to Blackboard.

DB refers to Discussion Board.

HNSC 7110X

Course Competencies and Objectives

Program Competencies	Course Learning Objectives	Sessions
This course will help you to achieve the following competencies, which are expected of MPH graduates	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed as part of the following course assignments:
Apply the public health core functions of assessment, policy development and assurance	• Summarize the history and evolution of the field of social and behavioral health. • State the difference across primary, secondary and tertiary prevention. • Describe the role of social and community factors, including respect for individuals and communities, including sensitivity to cultural issues, in the onset and the development, implementation, and evaluation of public health strategies, programs, research, and policies as solutions of public health problems • Describe opportunities, challenges, methods of applying an evidence-based, systems approach to program planning, including the application of relevant social ecological models to public health.	• Discussion board leader • Discussion board participant • Research paper
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Identify basic theories, concepts and models from a range of social and behavioral disciplines that are used in public	• Discussion board leader • Discussion board participant • Research paper • Exams

	health research and practice. • Describe leading theories of individual, interpersonal, group, organizational, and community-level change. • Compare and contrast different models and theories, including the health belief model, social cognitive theory, community organizational theories, the socio-ecological model, and systems science, with regard to social and behavioral change. • Describe how health and disease are socially constructed. • Summarize basic principles and methods of effective health communication and social marketing to create social and behavioral change. • Summarize the theory of diffusion of innovation. • Justify the relevance of at least one theory from fields others than public health that may inform solutions for a public health problem.	
Adhere to ethical and social justice principles and standards	• Relate contemporary public health problems to power and resource distribution, equity, diversity, sustainability, and intended and unintended consequences of interventions.	•
Interpret and analyze public health literature and apply evidence-based research	• Conduct a systematic literature review of a public health issue using bibliographic databases, government statistics and other information available on the Internet • Conduct a comprehensive literature search and compile the results thereof on a given social and behavioral health issue.	• Discussion board leader • Discussion board participant • Research paper

	• Critique the merits and limitations of a scientific article with relevance to social and behavioral health.	
Communicate public health information through oral, written, digital and visual presentation	• Develop skills for writing research papers using a scholarly format by employing a critical review and synthesis of the literature on a selected public health topic • Produce scientific writings pertaining to social and behavioral issues in public health.	• Research paper • PowerPoint presentation
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Analyze the impact of individual, organizational, community, national, and global trends and interdependencies including, but not limited to, major economic, political, and environmental forces, that shape the health of U.S. urban populations, contribute to public health related problems, and influence systems. • Identify basic social and behavioral theories, concepts, and models that explain differences in the distribution of health and illness in the United States (including multiple perspectives on the meaning of key social concepts such as race, class, ethnicity, gender, and disability) • Describe the role of poverty, discrimination, and stress in health and disease. • Illustrate how multilevel and systems-oriented interventions can influence individual and population health outcomes.	• Discussion board leader • Discussion board participant • Research paper • Exams

	• Illustrate different dimensions of social and health inequity and design solutions that may help to address inequity. • Summarize key features of a life course perspective on health. • Apply different levels of the socio-ecological model to issues such as obesity, mental health, and injury and violence.	
Design and evaluate interventions to prevent or control public health problems	•	•
Engage and collaborate with diverse groups	• Describe the strengths and limitations of social and behavior-based interventions and policies for improving the health of urban populations with an emphasis on reducing health disparities.	• Discussion board leader • Discussion board participant • Research paper
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	•	•

Course Expectations and Assessment

Online courses can be challenging to master in the beginning. As a first step, you MUST thoroughly review both the syllabus and the other materials available in the "Syllabus & Other Course Information" folder on BB.

Technical requirements

- Access to an Internet connection with high bandwidth for streaming video, Flash and audio
- Mozilla Firefox or Microsoft Internet Explorer Internet browsers preferred
- Microsoft Office applications (Word, Excel, PowerPoint), version 2010 or later
- You may NOT use a Smartphone, tablet or any other device other than a computer to complete activities such as DB posts or exams.

For technical assistance with BB, please contact Brooklyn College's Information Technology Systems (ITS) Help Desk at 718-677-6180 (9am-5pm) or email helpdesk@brooklyn.cuny.edu

For basic information on how to use BB, go to:
http://dewey.brooklyn.cuny.edu/resources/index.php?#computing

Student expectations

- Students are expected to thoroughly understand all requirements, components, and procedures of this online class by carefully reviewing the syllabus and asking questions.

- Students are expected to successfully navigate the various components of Blackboard, including the Discussion Boards (henceforth referred to as DB), assignments, and exams, by dedicating an adequate amount of time (well in advance of any deadlines) to exploring the site and accessing the help resources available to them.

- Students are expected to log onto the course BB site several times a week to read announcements, retrieve and view course materials, and participate in the Discussion Boards.

- Students are expected to ensure that they have reliable and timely access to an adequate Internet connection. In other words, if your home computer crashes or Internet access fails, you will be able to use a university computer or a friend's computer to access course materials, submit postings and assignments, and take exams by the stated deadline. "My computer or Internet crashed (or BB froze) so I couldn't post to the Discussion Board" is not an acceptable excuse.

Suggestions for a successful online experience

Time management is crucial in an online class. It is expected you complete all the assigned readings for each of the class sessions, and that you join each week's DB prepared to thoughtfully read, write, and learn.

Please note that this marks a significant difference from some face-to-face courses, where you might be able to fall behind on reading and catch up before exams or papers are due without your grade being affected. Staying on schedule by doing the reading will make the class more enjoyable for you, make for a better learning experience, make for livelier DBs, and improve your grade.

Assessment

The way you are assessed and graded for an online class does not differ greatly from a face-to-face class. Your grade is derived from six basic course components, which are listed below and described in the table that follows:

1.	Discussion Board (DB) leader	10 points
2.	DB participant (9 articles + review of at least 1 student PowerPoint presentation)	20 points
3.	Midterm exam	15 points
4.	Final exam	15 points
5.	Paper	30 points
6.	Presentation based on the paper	10 points

Component	% of Grade	What is it?	Where is it?	What else should I know?
1. Discussion Board leader	10%	• As the DB leader, you must post a substantive original comment of at least 250 words and raise one open-ended question by MONDAY at 11:59pm. The criteria for DB leader points are displayed below.	• See the heading for DB leader assignments on BB.	• Everyone will act as DB leader once. • The DB leader readings were randomly assigned by the instructor. • DB posts are formal written assignments for a graduate level course and will be graded as if you had handed in your writing on a piece of paper (e.g., in the form of an essay or research paper). • See the criteria for grading the DB leader below. • If it is impossible for you to be a DB leader on the assigned date, it is your responsibility to find a classmate to switch with you. The instructor must be informed in writing by both students that the change was made and it is acceptable to both of you. Please submit the change at least one week prior to the due date of any changes.

2. Discussion Board participant	20%	• You are responsible for commenting on 9 articles plus at least 1 student PowerPoint presentation. **You must choose at least one article each week**. Each post of yours is worth 2% of your final grade. • You must post a minimum 100-word response to the leader's post. This may be in multiple posts. • The criteria for the DB participant points are displayed below. • All comments are due by 11:59pm on the Sunday at the end of the session week.	• Each week's DB is located in that week's folder. The first DB is in Session 3.	• DB participant responses are formal comments appropriate for a graduate level class and will be graded as if you had submitted it in writing to the professor. • Make sure to identify which article/post you are commenting on. • See the criteria for grading the DB participant below.
3. Midterm exam	15%	• A midterm exam will be given about halfway through the semester. The exam is based on assigned readings and films, PowerPoints, and discussions. There are no exemptions from the midterm. • The exam will consist of multiple choice/true-false questions. It is timed.	• The midterm will take place on the week of the 8th session. The exam will be posted on BB.	• Further information about the exam will be posted. • The exam must be completed individually and without referring to notes or reading materials
4. Final exam	15%	• A final exam will be given at the end of the semester. The exam is based on assigned readings and films, PowerPoints, and discussions for the subjects covered after the midterm exam. There are no exemptions from the final exam. • The exam will consist of multiple choice/true-false questions. It is timed. • The final exam is not cumulative.	• The final exam will be posted below the "Course Sessions" area of BB in a folder labeled "Final Exam."	• Further information about the exam will be posted. • The exam must be completed individually and without referring to notes or reading materials

5. Library research paper	30%	• The purpose of the research paper is to give each student the opportunity to conduct an in-depth examination of the application of social theory and concepts to a health problem of interest. A list of possible topics is provided in the BB section on the research paper. • Papers are expected to be at least 12 pages (3,000 words) including references. In preparation, students will submit a proposed topic description early in the semester, and a detailed outline and bibliography later on. Each paper should have a brief abstract. • All papers must be typed, double-spaced, spell-checked and proofread. Use 1-inch margins all around and 12-point font. Please follow the APA format for citing references. A useful website for information on scholarly writing styles is: <http://owl.english.purdue.edu/owl/resource/560/01/> • You must submit an electronic copy through SafeAssign on Blackboard by the due date.	• Carefully review the section on the research paper that is listed as "Research Paper" on BB.	• The completed research paper must be submitted no later than 11:59PM on November 22, 2015. • NO LATE PAPERS WILL BE ACCEPTED.

6. Research paper presentation	10%	• Each student will prepare a PowerPoint presentation based on the research paper. The presentation should contain about 20 slides. Make sure to include an introduction, a full description of the main topic, a summary of the literature review and suggestions for future research in the area. • You may provide narration with the Powerpoint or notes on the bottom of the page to summarize the main points of the slide. If you are showing data on the slide, your commentary or notes should summarize the data for others.		• The PowerPoint presentation is due on 11/29/15. • NO LATE PRESENTATIONS WILL BE ACCEPTED.

IMPORTANT: LATE ASSIGNMENTS ARE NOT ACCEPTED. All DB posts must be posted in the appropriate place on BB and all exams completed by the date and time specified. **NO EXCEPTIONS.**

Discussion Board (DB) Guide for Leaders and Participants

Overview

Discussion boards are an integral part of this online course. You must post EVERY WEEK, either as a Discussion Board leader or in response to a leader's post, as a DB participant. Note that I will not be responding to every post of every thread, but I will be popping in to each DB periodically to spur conversation or give feedback.

Specific requirements

Post Requirements	Discussion Board Leader	Discussion Board Participant
Frequency	• Each student will be a DB leader once during the semester. • You must post on the date indicated in the syllabus.	• Each week there is a DB leader (9 weeks), you must select one article to post about. The last post will be a comment or response to at least one student PowerPoint presentation. • You must post by the date indicated in the syllabus.
Length and Content	• Your entry should be a minimum of 250 words (one typed page). • Discuss the main points from the specified readings. • Pose one open-ended question for participants to respond to. • The post must be free of spelling, grammatical, and punctuation errors. • You must substantively comment on at least 3 of the participants' responses.	• The post must respond to the open-ended question or to an issue raised by the DB leader. • You must post a minimum 100-word response to the leader's post. This may be in multiple posts • The post must be free of spelling, grammatical and punctuation errors.

For Full Credit	• The post was substantive and captured important points from the articles. • The open-ended question prompted a scholarly discussion of the issues. • The post was constructive and differences of opinion are expressed in a collegial manner. • The response to the participants' comments is on topic and appropriate.	• Post showed ample evidence of having completed the relevant readings, as well as evidence that the participant thought about colleague's post. • Post was constructive and differences of opinion are expressed in a collegial manner.

In addition, ALL posts should demonstrate:

Quality of Thinking: Develop, support, and convey clear, focused, and substantive ideas in ways appropriate to topic, context, audience, and purpose

Organization and Coherence: Organize writing in clear, coherent sequences, making connections and transitions among ideas, paragraphs, and sentences

Sentence Structure and Word Choice: Use and vary sentence structures and word choices to achieve clear and fluent writing

Editing: Edit for correct spelling, grammar, punctuation, capitalization, paragraph structure, sentence construction, formatting, and, when appropriate, citations

Use of Researched Information: Use, integrate, and cite researched information and evidence

Reflection: If appropriate, evaluate and articulate one's own point of view supported by research and logic

Remember: DB posts are formal written assignments for a graduate-level course and will be graded as if you had handed in your writing on a piece of paper (e.g., in the form of an essay or research paper).

READING/ASSIGNMENT SCHEDULE & CALENDAR

This schedule, including assigned readings and due dates, is **SUBJECT TO REVISION** throughout the semester.

DB leader reviews are due on the Monday of each week.

DB participants' comments are due on the Sunday of each week.

Session	Dates	Topics	Required Readings and Multimedia Materials	Activities due by 11:59pm on due date
#1	8/31-9/6	Overview and introduction to the course.	1. National Research Council & Institute of Medicine (2013). *US Health in International Perspective: Shorter Lives, Poorer Health.* Washington, DC: The National Academies Press. Read the Summary on pages 1-9 at: http://www.nap.edu/openbook.php?record_id=13497&page=1 2. Braveman P. (2014). What are health disparities and health equity? We need to be clear. *Public Health Reports* 129: 5-8 (supplement 2). 3. Bassett M. (2015). #BlackLivesMatter — A Challenge to the Medical and Public Health Communities. *New England Journal of Medicine* 372:1085-1087. ➢ Carefully read http://library.brooklyn.cuny.edu/resources/loop/research.php?s=250&c=948 The Health and Nutrition Science librarian has prepared this website to assist you in conducting research for your paper. Read the entire "Public Health Loop." ➢ Review PowerPoint posted for Session 1.	• Read all the articles for this week and view the websites specified by 9/6. • Read the entire syllabus. • Make sure you understand the technology involved for the course and if you do not, contact the resources specified. • Carefully review the information about the paper. Think about your paper topic. • Provide your brief intro on the Discussion Board. • Optional post to DB – Do you believe that health care is a right? Explain your answer.

#2	9/7-9/13	Introduction continued. Selected important concepts in social and behavioral sciences	1. Adler N & Stewart J. (2009). Reducing obesity: Motivating action while not blaming the victim. *The Milbank Quarterly* 87: 49-70. 2. Earnshaw V. et al. (2013). Stigma and racial/ethnic HIV disparities. *American Psychologist* 68: 225-236. 3. Grollman E. (2014). Multiple disadvantaged statuses and health: The role of multiple forms of discrimination. *Journal of Health and Social Behavior* 55: 3-19. Read only pp. 3-6; 14-16. 4. Hatzenbuehler M and Link B. (2014). Introduction to the special issue on structural stigma and health. *Social Science and Medicine* 103: 1-6. 5. Cooper et al. (2015). Calling for a bold new vision of health disparities intervention research. *American Journal of Public Health* 105 (supplement 3): s374-s376.	• Read all the articles assigned for this week by 9/13. • Submit the topic of your paper by 9/13. See the instructions under "Research Paper."

#3	9/14-9/20	Factors influencing health: Race and SES	1. Freiden TR (2010). A framework for public health action: The health impact pyramid. *American Journal of Public Health* 100: 590-595. 2. Braveman PA et al. (2011). Broadening the focus: The need to address the social determinants of health. *American Journal of Preventive Medicine* 40: S4-S18. 3. Satcher D & Higginbotham EJ (2008). The public health approach to eliminating disparities in health. *American Journal of Public Health* 98: 400-403. 4. Williams DR et al. (2010). Race, socioeconomic status, and health: Complexities, ongoing challenges, and research opportunities. *Annals of the NY Academy of Sciences* 1186: 69-101. 5. Braveman PA et al. (2011). The social determinants of health: Coming of age. *Annual Review of Public Health* 32: 381-398. 6. David R and Collins J (2014). Layers of inequality: Power, policy, and health. *American Journal of Public Health* 104: S8-S9. View the following film, "When the Bough Breaks" from *Unnatural Causes* (about 30 minutes) http://1660912-2.mediaspace.kaltura.com/media/Unnatural+CausesA+When+the+Bough+Breaks+%28Part+2%29/1_cutxz67l	• DB leaders for Session 3 post discussion and open-ended question based on this week's readings. DUE on 9/14/15. • DB participant responses DUE on 9/20/15. • Optional viewing Roberts, a legal scholar and author of *Fatal Invention: How Science, Politics, and Big Business Re-create Race in the Twenty-First Century*, examines the political and commercial incentives for continuing the categorization of people by race. http://www.pbs.org/wnet/tavissmiley/interviews/law-professor-author-dorothy-roberts/ • Optional webinar Naming and Addressing Racism: A Primer. Presented by the American Public Health Association, July 21, 2015. https://cc.readytalk.com/cc/playback/Playback.do?id=gj5zph If you view or listen to either of these optional talks, please comment on the DB for the week.

#4	9/21-9/27	Neighborhoods and health	1. Braveman PA et al. (2011). Neighborhoods and health. Robert Wood Johnson Foundation. 2. Diez Roux AV & Mair C (2010). Neighborhoods and health. *Annals of the NY Academy of Sciences* 1186: 125-145. View the following film, "Place Matters" from *Unnatural Causes* (about 30 minutes) http://1660912-2.mediaspace.kaltura.com/media/Unnatural+CausesA+Place+Matters+%28Part+5%29/1_z0na9s8b	• DB leaders for Session 4 post discussion and open-ended question based on this week's readings. DUE on 9/21/15. • DB participant responses DUE on 9/27/15.
#5	9/28-10/4	Work and health	1. Burgard SA & Lin KY (2013). Bad jobs, bad health? How work and working conditions contribute to health disparities. *American Behavioral Scientist* 57: 1105-1127.	• DB leader for Session 5 posts discussion and open-ended question based on this week's readings. DUE on 9/28/15. • DB participant responses DUE on 10/4/15.
#6	10/5-10/11	Health disparities: Gender and health	1. Rieker PP and Bird CE (2005). Rethinking gender differences in health: Why we need to integrate social and biological perspectives. *Journals of Gerontology* (Special Issue II) 60B: 40-47. 2. Rosenthal L. and Lobel M. (2011). Explaining racial disparities in adverse birth outcomes: Unique sources of stress for Black American women. *Social Science & Medicine* 72: 977-983. 3. Christopher G and Simpson P. (2014). Improving birth outcomes requires closing the racial gap. *American Journal of Public Health* 104: S10-S12.	• DB leaders for Session 6 post discussion and open-ended question based on this week's readings. DUE on 10/5/15. • DB participant responses DUE on 10/11/15.

#7	10/12-10/18	Health behaviors	1. National Cancer Institute (2005). Theory at a glance: A guide for health promotion practice. 2. Braveman P et al. (2011). What shapes health-related behavior? The role of social factors. Robert Wood Johnson Foundation. 3. Glanz K and Bishop DB (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health* 31: 399-418.	• DB leaders for Session 7 post discussion and open-ended question based on this week's readings. DUE on 10/12/15. • DB participant responses DUE on 10/18/15. • Paper outline and references due on 10/18/15. • For further information on some of the theories, you may want to view: Health Belief Model https://www.youtube.com/watch?v=6SfTbTkEozA Theory of Planned Behavior https://www.youtube.com/watch?v=DFn-lOcpd8A Transtheoretical Model of Behavioral Change https://www.youtube.com/watch?v=oO80XyBDrl0
#8	10/19-10/25	Mid-term	Further information will be provided.	Date to be announced.

#9	10/26-11/1	Social construction of illness and disease	1. Conrad P. & Barker KK (2010). The social construction of illness: Key insights and policy implications. *Journal of Health and Social Behavior* 51(S): S67-S79. 2. Cotton C. & Ridings JW (2011). Getting out/getting in: The DSM, political activism and the social construction of mental disorders. *Social Work in Mental Health* 9: 181-205. 3. Barker KK (2010). The social construction of illness. Medicalization and contested illness. Chapter in *Handbook of Medical Sociology*, 6th edition, edited by Bird CE et al.	• DB leaders for Session 9 post discussion and open-ended question based on this week's readings. DUE on 10/26/15. • DB participant responses DUE on 11/1/15.
#10	11/2-11/8	Culture and health	1. Kleinman A and Benson P. (2006). Anthropology in the clinic: The problem of cultural competency and how to fix it. *PLoS Medicine* 3 (10): 1673-1676. 2. Miner H. (1956). Body ritual among the Nacirema. *The American Anthropologist* 58: 503-507. 3. Lara M. et al. (2005). Acculturation and Latino health in the United States. *Annual Review of Public Health* 26: 367-397. 4. Castaneda H. et al. (2015). Immigration as a Social Determinant of Health. *Annual Review of Public Health* 36: 375-392.	• DB leaders for Session 10 post discussion and open-ended question based on this week's readings. DUE on 11/2/15. • DB participant responses DUE on 11/8/15.

#11	11/9-11/15	Stress, social support and health	1. Thoits PA (2010). Stress and health: Major findings and policy implications. *Journal of Health and Social Behavior* 51: S41-S53. 2. Egerter S et al. (2011). How social factors shape health: The role of stress. Robert Wood Johnson Foundation. 3. Heaney CA & Israel BA (2008). Social networks and social support. In Glanz K et al. (eds.) *Health Behavior and Health Education. Theory, Research, and Practice, 4th edition.* CA: John Wiley & Sons, Inc. 4. Umberson D et al. (2010). Social relationships and health behavior across the life course. *Annual Review of Sociology* 36: 139-157. 5. Hicken M et al. (2014). Racial/ethnic disparities in hypertension prevalence: Reconsidering the role of chronic stress. *American Journal of Public Health* 104: 117-123. Read pp. 117-118 and 121-123.	• DB leaders for Session 11 post discussion and open-ended question based on this week's readings. DUE on 11/9/15. • DB participant responses DUE on 11/15/15.

#12	11/16-11/22	Health communication and health literacy	1. Paasche-Orlow M & Wolf M. (2010). Promoting health literacy research to reduce health disparities. *Journal of Health Communication* 15: 34-41. 2. Gazmarian JA et al. (2005). Public health literacy in America. *American Journal of Preventive Medicine* 28 (3): 317-322. 3.Kutner M, Greenberg E, Jin Y and Paulsen C. (2006). The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy (NCES 2006-483). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubs2006/2006483_1.pdf Read executive summary and introduction. 4. Storey D et al. (2014). What is health communication and how does it affect the HIV/AIDS continuum of care. *Journal of Acquired Immune Deficiency Syndrome* 66 (suppl 3): S241-S249.	• DB leaders for Session 12 post discussion and open-ended question based on this week's readings. DUE on 11/16/15. • DB participant responses DUE on 11/22/15. • Paper due on 11/22/15.
#13	11/23-11/29	Student presentations	See the instructions on the "Research Paper section of BB for additional information.	• Due 11/29/15.
#14	11/30-12/6	Review, evaluations, discussion	Review the Powerpoint presentations and in the DB provide comments.	• Post comments on students' Powerpoint presentations on the DB by 12/6/15.
#15	12/7-12/13	Final exam	Further information will be provided.	• Date to be announced.

COURSE POLICIES

Attendance and class participation

This course is fully online and thus, there are no fixed meeting times. However, students are expected to fully participate on the DBs on BB and submit the assignments on the dates they are due. If you do not participate on the DB or submit your work on time, you will lose points from your final grade.

Class citizenship and rules of conduct

When communicating or completing assignments online via BB, pay attention to the following:

- Check before you post. Always check whether a similar question has been previously posted and answered on the DB.
- On DB, write in short paragraphs or use bullets to break down your ideas into smaller chunks of information. This will make your posts easier to read.
- Do not write in all uppercase. USING ALL CAPS MEANS YOU ARE SHOUTING.
- Do not use sarcasm as it often is interpreted as rude and hurtful.
- Do not edit or change someone else's message content. If you have something to add or change, add a follow-up message.
- Students in the class may come from different places around the world, so be respectful to diverse perspectives, cultures and languages.
- Be professional and engage with others respectfully.

Email correspondence

If you would like to contact me, I will respond to most questions via email. However, if you have a more substantive issue to address, please arrange to meet with me (in person or on the phone) during office hours.

When you email me, you can usually expect a response within 2 business days, sometimes sooner. Do not expect an immediate response.

Golden Rules for Email

- Keep in mind that I get many emails a day. ALWAYS put "HNSC 7110 - [Your name]" in the subject line so that I know who the message is from and what it is in regard to.
- You are expected to conduct yourself in a professional manner in all of your interpersonal interactions, including in email. Email is a formal means of communication in the context of school or work; please sign every message at the bottom, use polite language, capital letters, punctuation, greetings and salutations. Please avoid abbreviations, slang, and cuteness.

Other forms of communication

In person: My "live" office hours at Brooklyn College for Fall 2015 are Tuesday and Thursday, 7:30 AM – 9:00 AM and 10:45 AM – 1:00 PM. On occasion, because of meetings, I am not available at 10:45-1:00. You are welcome to drop by during office hours, but to avoid long waits and the possibility that I will not be present, please make an appointment for a specific time via email.

Phone: I can also make appointments to talk with students on phone during office hours.

Please make these appointments via email. I am rarely right in front of my Brooklyn College phone (unless we have scheduled a phone meeting), and I usually only pick up phone messages during office hours, so the phone is not the most efficient way to contact me, unless you want to let me know that you are running late for a face-to-face meeting.

Help with writing

If you require assistance to improve your writing skills, consider visiting the BC Learning Center. Information about the Learning Center is available at: http://lc.brooklyn.cuny.edu/. During some semesters, the Department of Health and Nutrition Sciences (HNSC) has a writing tutor available for HNSC students. At this time, as I am preparing this syllabus and course information, I do not know if/when a writing tutor will be available. I will inform you, should someone be assigned. .

INSTITUTIONAL POLICIES

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Graduate Bulletin and the Program Director for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Library Research Paper

The purpose of the research paper is to give each student the opportunity to conduct an in-depth examination of the application of social theory and concepts to a health problem of interest. A list of possible topics is provided. You may select one of these subjects or another topic of interest. This is a library research paper. You will not be conducting interviews or collecting your own survey data.

Make sure you carefully read http://library.brooklyn.cuny.edu/resources/loop/research.php?s=250&c=948 which was posted under the first session of the class. It is an excellent source for conducting library research in public health.

Papers are expected to be at least 12 pages (3,000 words) including references. In preparation, students will submit a proposed topic description early in the semester, and a detailed outline and bibliography later on.

Each paper should have an abstract. An abstract is a brief (about 100 words) statement of the objectives, findings and conclusions of the paper. It should be provided at the beginning of the paper. It does not count toward the 12 pages specified above.

Paper deadlines -

a. Proposed topic (about one typed page): September 13
b. Paper outline and references: October 18 or earlier [Do not provide a narrative of the topic; you are required to submit a formal outline.]
c. Final paper: November 22 or earlier. NO LATE PAPERS WILL BE ACCEPTED.

All papers must be typed, double-spaced, spell-checked, and proofread. Use 1-inch margins all around and 12-point font. Please follow the APA format for citing references.

To learn about plagiarism and how to properly cite sources go to: http://libguides.brooklyn.cuny.edu/c.php?g=225782&p=1496389

It is your responsibility to learn and properly use the APA format. Papers that do not meet these requirements will lose points.

You should search for the most recent academic and professional journal articles on the topic. Unless there is a seminal paper in the subject of your paper, as a rule, do not use references earlier than 2009.

Although you may use Internet sources from the CDC or the US Department of Health and Human Services, you may not use most other non-scholarly sources. If you are uncertain about what constitutes a scholarly source, you should contact a reference librarian in the BC library. Lee Ann Fullington is the specialist librarian for the Department of Health and Nutrition Sciences, although other reference librarians may assist you. Prof. Fullington may be contacted at LAFullington@brooklyn.cuny.edu

You must submit a final electronic copy through SafeAssign on Blackboard, which should be labeled as **FINAL VERSION**. Prior to when the paper is due, you will be able to submit earlier versions of the paper to SafeAssign to identify areas of possible plagiarism on the paper. The earlier versions will not be read by the instructor, but rather used by you as a tool to identify plagiarism. **The final version should also be submitted to me through email.**

Plagiarism of any kind – from the Internet, books, journals, another student's paper, etc. – results in an automatic grade of 0 for the assignment. It is your responsibility to understand what plagiarism is and how to avoid it.

Possible topics for the library research paper

It is important to select a specific topic. Please note the use of "or" in the topics below. You are not limited to these subjects. Select a topic that is of special interest or importance to you and within the subject area of this course. The course readings may also give you some ideas for possible paper topics.

- Stigma about mental illness or obesity or a specific sexually transmitted infection
- The effect of social support on recovery from major heart surgery or a mastectomy or another medical condition
- The effect of the media on adolescent use of alcohol or tobacco
- Factors that influence teens' drug use or contraceptive use. Focus on either young women or men
- Factors that influence health care providers' attitudes and behaviors toward LGBQ patients or obese patients or self-abusing patients or patients with a mental illness
- Stress and poor birth outcomes
- Problems in communication between low-English proficiency patients and their physicians
- The effect of religion on patients' choices about end-of-life care (select a specific religion)
- The social construction of a mental disorder or ADHD or autism
- The effect of immigration status on health
- The factors that influence teens' attitudes and perceptions of violence
- The factors that affect body image for young girls (select a specific racial-ethnic group)
- The effect of neighborhood on women's health status
- The psychological outcomes following mastectomy or coronary bypass surgery or another major health event
- The health impact of low health literacy
- Factors associated with low health literacy
- The intersection of race and stress
- The medicalization of childbirth or menopause
- The effect of neighborhood on obesity
- The role of corporations in influencing smoking or alcohol consumption or obesity

Last Updated August 19, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Brooklyn College
HNSC 7141X Planning, Strategic Analysis, and Organizing of Health Care Services
3 Credits
Fall 2015

Time and location	4141 Ingersoll Hall Mon 6:30- 9.
Instructor	Sean J. Haley, Ph.D., MPH Best Contact: sjhaley@brooklyn.cuny.edu Office Telephone: (718) 951 – 5000 x2776
Office hours	4:30-6:00 Monday, 2:15-3:30 on Tuesdays, and by appointment. 4430 Ingersoll Hall
Course website	Provide the hyperlink to the CUNY Blackboard website or an alternative, instructor specific course website https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Dilemmas resulting from the practice of the health sciences including clinical care, public health practice, human subjects research, and the delivery of health services and the development of health policies. Conflicting needs and values of the practioners, clients, health care system, and communities. Critical evaluation of proposed solutions offered by the professions, government, communities. Case study evaluations. Examination of historic and contemporary cases.
Course prerequisites	Health and Nutrition Sciences 7140X
Course format	Seminar
Required reading and resources	Materials available on the course Blackboard site
Suggested reading and resources	Available on the course Blackboard site

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Demonstrate knowledge of political, economic and social context of health policies	• Explain the organization of health care • Describe the impact of costs on the health care system • Explain the principles of health service delivery • Investigate the impact of cost, care and delivery of health services through health reform • Differentiate the needs uninsured versus insured • Describe Medicaid, Medicare, and other public health insurance programs	1,2,3,4,5,6,7,8,9,10,12,13,14 Midterm. Final Exam. Case Studies
Examine, analyze and explain the intended and unintended consequences of national policies and reforms	• Identify potential implications of Medicare and Medicaid reform • Describe the health safety net • Describe the basics of primary care • Identify hospital organization models and strategies	1,2,3,4,5,6, 7, 8,9, 10,12,13,14 Case Studies
Discuss the policy process for improving the health status of populations	• Identify long term care needs and service delivery models • Describe the impact of health reform on long term care services • Describe the association of substance abuse and chronic disease • Explain the intersection of medical care and health reform on population health	1, 2,3,5,6,13,14 Midterm. Final Exam. Case Studies
Discuss the legal and ethical bases for public health and health services	• Describe the impact of health reform requirements on delivery systems in response	1,2,3,4,5,6,7,8,9,10,12,13,14 Midterm. Final Exam. Case

	to changing population needs	Studies
Demonstrate leadership skills for building partnerships	• Explain the challenges of health services management • Identify opportunities in health service management	Case studies
Apply principles of program planning, development, budgeting, management and evaluation in organizational and community initiatives	• Explain the basic principles of program planning and evaluation • Explain cost clusters • Identify constraints in cost clusters	3, 4, 5, 6, 7, 8, 9, 10 Midterm. Final Exam. Case Studies
Explain methods of ensuring community health safety and preparedness	• Explain the purpose of evidence based medicine and public health • Describe the principles and mission of public health research to improve the health and safety of the public	7,8,9,10 Case Studies, midterm and final
Apply systems thinking for resolving organizational problems	• Identify different source of public health data • Describe current trends and issues relating to health service management and health reform • Identify the information needs in health service delivery	Case studies

Course Assessments

Presentations: You are required to present two articles in front of the class using PowerPoint. The sign-up sheet will be distributed at the first class. Presentations should be emailed through Blackboard to Professor Haley by midnight the night before the class meeting. Presentations should take no longer than 10 minutes.

You will also be graded for your group presentation. Each group will present its case in front of the class. The presentation should take no longer than 15 minutes with 10 minutes for questions. A grading rubric and an example of a thorough presentation will be posted to Blackboard.

Case Study: The case studies are pulled from my own work experiences and will require you to synthesize course material. Reviewing material in the corresponding resource folders is highly recommended. It is unlikely that you will be able to develop a robust product without thoroughly consulting the literature. A rubric will be posted.

The case will be a team project. In forming your groups, be sure to balance talent with availability. All team members will receive the same grade –unless peer review forms offer compelling reasons for an adjustment.

- Once teams are formulated, a group folder will be created in Blackboard under groups. We will have 1 face to face meeting and one virtual meeting using the Blackboard collaborate feature. Please review operating requirements (see administration folder) and update necessary software in advance of scheduled meetings. The final document should look like a it is being submitted form a professional consultant organization.
- A electronic draft of the case report will be due on the same day as the presentation. The electronic version must be electronically submitted to your review team (with a cc to me) by the start of class. The review team (your peers) will have 5 days to return it to you with comments. See below.
- Resources: The following web site has a superb list of health care and health services resources. It is recommended that students review when preparing cases. http://www.lib.berkeley.edu/PUBL/HealthCare.html

Case study critiques for both the oral and written presentation will be graded. Please refer to the posted rubric.

- Critiques for oral presentations will be completed in class.
- Written critiques will be completed by each member of the review team using track changes. A summary letter, highlighting the strengths and challenges of the report, including recommendations, helpful citations, etc., must accompany the edited document and be submitted to the team and Dr. Haley no later than Friday at midnight following the draft due date. The review team will be assessed for the quality of their comments.

Mid term and final exams: Exams will be comprised of short answer, brief concept and essay questions. Exams will be closed book/notes.

- Recommendation: To prepare for exams, you are strongly encouraged to summarize each article. Recommended format:
    - Lead author, title, year
    - Major Findings
    - Major Relevance
    - Strengths/Weaknesses
    - Implications to quality, cost, and population health.

Class participation will be graded. Please see rubric. Class attendance will be taken at the beginning of class. Please arrive on time. Should you not be able to attend due to religious beliefs, I ask that you provide written (email) notice at least a week in advance.

Grading

Evaluation criteria

Rubrics for all assessments appear on Blackboard.

The relative weight of each course component is as follows:

Assessment	Weight
Midterm	30%
Final	30%
Case Study	20%
Article Presentations	5%
Case Study Critiques	5%
Case Study Presentation	5%
Class participation	5%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

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A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
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F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

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Course Policies

Attendance and class participation

Attendance is required. Missing a class without an offic8ial excuse will result in a deduction. Showing up is necessary but active, critical participation is expected. Please see rubric.

Late/incomplete submission of assignments

Late assignments are due at the start of class. Late assignments will not be accepted. Case studies or presentations that are not professional in either appearance or content will be returned, ungraded.

Make-ups, rewrites, and extra credit

There are no makeup exams (unless you have a documented college-approved excuse. Please provide advance notice if you will miss an exam for such a reason). If you arrive late to an exam, you will have until the end of the allotted time period to finish (i.e., no

extra time will be granted). No students will be admitted for an exam after another student has completed/turned in an exam. Products that are returned without grades will be given a 5 point deduction and 1 week resubmission deadline. There is no extra credit.

Expectations of students

- Please read the material. The seminar discussion will fall flat if you do not fully engage the material.
- It is critical that your writing is clear and commensurate with professional level writing. The Library maintains a collection of links to sites that can assist you with proper citation format and paraphrasing and quoting other authors at http://library.brooklyn.cuny.edu Research & Writing Help. The Learning Center has writing tutors available to help you with your writing http://lc.brooklyn.cuny.edu/. Writing that is below professional standards will be returned.
- As a graduate student, you are expected to spend at least 3-5 hours per course credit, per week, doing course-related work. As this is a 3-credit class, you should anticipate spending 12-15 hours/week outside of class time doing work for this course. Please plan appropriately.
- You will be required to use your name@brooklyn.cuny.edu email address. This is provided free from the college. It is the only way you will be able to access blackboard (also a requirement) and course announcements. I use the emails listed on Blackboard frequently. It is **your** responsibility to resolve any password or access issues (for email and Blackboard) to assure that you receive those emails. Call ITS at 718-951-HELP.
- You will need regular access to the Internet in order to access your brooklyn.cuny.edu email address and Blackboard. All assignments will be distributed via Blackboard.

Expectations for the instructor

I will be available for office hours and by appointment as needed.

Accessibility

In order to receive disability-related academic accommodations, students must first register with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell, at (718) 951-5538. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Academic integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Brooklyn College procedure for implementing the policy can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

Course Schedule

Please note that the schedule is subject to change throughout the semester pending speaker availability and other influences. Notice of schedule changes will be sent through Blackboard. Please see: http://www.cuny.edu/academics/calendars/fall-2015.html for important dates (for example: holidays, course drop, course withdrawal).

August 31
Class 1: Introduction to Critical Issues in Health Care Services: Quality, Population Health and Costs
Class Objective:

1) To provide an overarching context to understand health system policies related to changes in the organization and delivery of health services, costs and care under Health Reform.

Grumbach, K. and Bodenheimer, T. (1995). The organization of health care. *JAMA*. 273(2):160-167.

Berwick, D.M., Nolan, T.W., and Whittington, J. (2008). The triple aim: care, health, and cost. *Health Affairs* 27:759–769.

Donabedian, A. (1988). The quality of care: How can it be assessed? *Jama, 260*(12), 1743-1748.

Navarro, V. (1993). Health Services Research: What is It? A Review of Health Services Research: An Anthology, Edited by KL White, J. Frenk, C. Ordoñez, JM Paganini, and B. Starfield, and Published by the Pan American Health Organization, 1992. *International Journal of Health Services, 23*(1), 1-13.

Berwick DM. (2002). A user's manual for the IOM's 'Quality Chasm's report. *Health Affairs.*21(3):80-90.

September 7 (College closed)

September 10 (Thursday –follows a Monday schedule)
Class 2: Population Health

Class Objective:
1) To better understand how public health, medical care and health reform intersect to improve population health.

Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of health and social behavior*, 80-94.

Braveman, P., Egerter, S., & Williams, D. R. (2011). The social determinants of health: coming of age. *Annual review of public health, 32*, 381-398.

Preston, C. M., & Alexander, M. (2010). Prevention in the United States Affordable Care Act. *J Prev Med Public Health, 43*(6), 455-458.

Soto, M. (2013). Population health in the affordable care act era. Retrieved August 24, 2013, from http://www.academyhealth.org/files/AH2013pophealth.pdf

Briss, P. A., Zaza, S., Pappaioanou, M., Fielding, J., Wright-De Agüero, L., Truman, B. I., ... & Harris, J. R. (2000). Developing an evidence-based guide to community preventive services' methods. *American Journal of Preventive Medicine, 18(1), 35-43.*

New York:
Boufford, J.I., Finkelstein, R., Garcia, A., (2012). Federal Health Care Reform in NYS: A Population Health Perspective. *New York State Health Foundation & The New York Academy of Medicine*. Pp 1-42.

September 14: No Class

September 21
Class 3: Access, Health Insurance, the Uninsured and Health Reform: The U.S. and New York State
Class Objectives:
1) To understand the traditionally uninsured and how their needs may differ from those that have been insured through employment, old age (Medicare) or extreme poverty (Medicaid) as they gain access to health coverage under Health Reform
2) To understand how delivery systems may change in response to Health Reform requirements and changing population needs.

Access:
Penchansky, R., & Thomas, J. W. (1981). The concept of access: definition and relationship to consumer satisfaction. *Medical Care*, 19(2), 127-140.

National View: Health Reform
The Henry J. Kaiser Family Foundation. (2010). "Focus on Health Reform: Summary of New Health Reform Law. " The Foundation. April, 2010. Pp.1-13. www.kff.org.

Collins, S., Rasmussen, P., & Doty, M. (2015). The rise in health care coverage and affordability since health reform took effect: findings from the Commonwealth Fund Biennial Health Insurance Survey, 2014. *Issue brief (Commonwealth Fund), 2*, 1-16.

Sommers, B. D., Baicker, K., & Epstein, A. M. (2012). Mortality and access to care among adults after state Medicaid expansions. *New England Journal of Medicine, 367*(11), 1025-1034.

Buettgens, M., & Hall, M. (2011). Who will be uninsured after health insurance reform. Robert Wood Johnson Foundation. http://www.rwjf.org/en/research-publications/find-rwjf-research/2011/03/who-will-be-uninsured-after-health-insurance-reform-.html

The Henry J. Kaiser Family Foundation. (2006). The Uninsured: A Primer. Key Facts About Americans Without Health Insurance. The Foundation. Pp.1-10.

New York View:
New York State Department of Health. (2011). A Plan to Transform the Empire State's Medicaid Program: Better Care, Better Health, Lower Costs. A Multi Year Plan. Medicaid Redesign Team (MRT). (Executive Summary Only)

Review:
The Henry J. Kaiser Family Foundation. (2008). How Private Health Coverage Works: A Primer. 2008 Update. The Foundation. Publication #7766.

September 28
Class 4: Costs and Strategies
Class Objective:

1) To understand how health services are organized, cost clusters and how they might be constrained.

What does it cost:
Kaiser Family Foundation. (2012). Health Care Costs a Primer: Key Information on Health Care Costs and Their Impact. The Foundation, WDC.

Lassman, D., Hartman, M., Washington, B., Andrews, K., & Catlin, A. (2014). US health spending trends by age and gender: selected years 2002–10. *Health Affairs, 33*(5), 815-822.

Implications:
Altman, D.E., Levitt, L. (2002). The sad history of health care cost containment as told in one chart. *Health Affairs*. 21(2):9.

Gruber, J. (2010). The cost implications of health care reform. *New England Journal of Medicine, 362*(22), 2050-2051.

Sisko, A. M., Keehan, S. P., Cuckler, G. A., Madison, A. J., Smith, S. D., Wolfe, C. J., . . . Poisal, J. A. (2014). National health expenditure projections, 2013–23: faster growth expected with expanded coverage and improving economy. *Health Affairs, 33*(10), 1841-1850.

Strategies to manage costs:
Mongan, J.J., Ferris, T.G. and Lee, L.H. (2008). Options for slowing the growth of health care costs. *The New England Journal of Medicine, 358*:1509-1514.

Bates, D. W., Saria, S., Ohno-Machado, L., Shah, A., & Escobar, G. (2014). Big data in health care: using analytics to identify and manage high-risk and high-cost patients. *Health Affairs, 33*(7), 1123-1131.

Fisher, E. S., Bynum, J. P., & Skinner, J. S. (2009). Slowing the growth of health care costs—lessons from regional variation. *New England Journal of Medicine*, *360*(9), 849-852.

Berwick, D. M., & Hackbarth, A. D. (2012). Eliminating waste in US health care. *JAMA: the journal of the American Medical Association, 307*(14), 1513-1516.

White, C., Reschovsky, J. D., & Bond, A. M. (2014). Understanding differences between high-and low-price hospitals: implications for efforts to rein in costs. *Health Affairs*, 10.1377/hlthaff. 2013.0747.

October 5
Class 5: Primary Care and Hospital Systems
(Case A released)
Class Objective:

1) To understand primary care and hospital organization models and strategies.

Role of Primary Care:
Davis, K., Abrams, M., & Stremikis, K. (2011). How the Affordable Care Act will strengthen the nation's primary care foundation. *Journal of General Internal Medicine, 26*(10), 1201-1203.

Block, L., Cook, B. G., Hanyok, L. A., de la Torre, D., Rogers, M. M., Noronha, G., & Sylvia, M. (2014). Coverage Isn't Enough: Building Primary Care Capacity in the Setting of Health Reform. *Journal of health care for the poor and underserved, 25*(1), 25-28.

Friedberg, M.W., Hussey, P.S., et al. (2010). Primary care: A critical review of the evidence on quality and costs of health care. *Health Affairs, 29*(5): 766-772.

Hospitals and competition:

Porter, M. (1979). How competitive forces shape strategy. *Harvard Business Review 57*(2), 137-145.

Baicker, K., & Levy, H. (2013). Coordination versus competition in health care reform. *New England Journal of Medicine, 369*(9), 789-791.

Cutler, D. M., & Morton, F. S. (2013). Hospitals, market share, and consolidation. *Jama, 310*(18), 1964-1970.

Harris, II, J., Ozgen, H., Ozcan, Y. (2000). Do Mergers Enhance the Performance of Hospital Efficiency?, *The Journal of the Operational Research Society, 51*(7), 801-811.

New York View:
Berger S. (2011) At the Brink of Transformation: Restructuring the Healthcare Delivery System in Brooklyn. A Report of the Brooklyn Health Systems Redesign Work Group. In. Albany, NY.
http://www.health.ny.gov/health_care/medicaid/redesign/docs/brooklyn_mrt_final_report.pdf

Invited guest: Susan Moscou Ph.D., MPH, NP, Associate Professor, Mercy College

October 12: No Class

October 19
Class 6: Quality: What and How?
(Case A- detailed outline - due 10/18-group meeting on 10/26 @ 8:30)
Class Objective:

1) To understand the need to measure quality, how it is influenced and strengths and challenges of quality improvement strategies.

What is quality care:
Committee on Quality of Health Care in America, Institute of Medicine. (2001). Crossing the quality chasm: a new health system for the 21st century. 1-22.

Campbell, S. M., Roland, M. O., & Buetow, S. A. (2000). Defining quality of care. *Social Science & Medicine*, *51*(11), 1611-1625.

McGlynn, E.A., Asch,S.M., et al., (2003).The Quality of Health Care Delivered to Adults in the United States. *New England Journal of Medicine, 348:*2635-2645.

Sofaer, S., & Firminger, K. (2005). Patient perceptions of the quality of health services. *Annu. Rev. Public Health, 26*, 513-559.

How do we measure it:

McGlynn, E. A. (1997). Six challenges in measuring the quality of health care. *Health Affairs*, 16(3), 7-21.

Behn, R. D. (2003). Why measure performance? Different purposes require different measures. *Public Administration Review*, *63*(5), 586-606.

Jha, A. K., Orav, E. J., Dobson, A., Book, R. A., & Epstein, A. M. (2009). Measuring efficiency: the association of hospital costs and quality of care. *Health Affairs, 28*(3), 897-906.

Brand, C. A., Barker, A. L., Morello, R. T., Vitale, M. R., Evans, S. M., Scott, I. A., et al. (2012). A review of hospital characteristics associated with improved performance. *International Journal for Quality in Health Care, 24*(5), 483-494.

How do we improve it?

Beach, M. C., Gary, T. L., Price, E. G., Robinson, K., Gozu, A., Palacio, A., . . . Bass, E. B. (2006). Improving health care quality for racial/ethnic minorities: a systematic review of the best evidence regarding provider and organization interventions. *BMC Public Health, 6*(1), 104.

October 26
Class 7: Federally Qualified Health Centers (Review Medicare & Medicaid)
NOTE: Class may meet in Manhattan. Please plan accordingly.
(Case A- detailed outline - due 10/18. Group meeting @ 9:00 on 10/19)
Class Objective:

1) To Understand the Health Care Safety Net
2) To Anticipate Changes Medicare and Medicaid under Health Reform

What are federally qualified health centers:
HRSA: What is a health center? http://bphc.hrsa.gov/about
Health Resources and Services Administration. The Affordable Care Act and Health Centers. In. Rockville, MD: Department of Health and Human Services; 2012.

National Association of Community Health Centers Chart Book (2014) (Skim)

Goldman, L. E., Chu, P. W., Tran, H., Romano, M. J., & Stafford, R. S. (2012). Federally qualified health centers and private practice performance on ambulatory care measures. *American journal of preventive medicine, 43*(2), 142-149.

Shi, L., Tsai, J., Higgins, P.C., Lebrun, L.A., (2009). Racial/ethnic and socioeconomic disparities in access to care and quality of care for US health center patients compared with non-health center patients. *Journal of Ambulatory Care Management, 32*(4): 342 – 50.

Shi, L., & Stevens, G. D. (2007). The role of community health centers in delivering primary care to the underserved: experiences of the uninsured and Medicaid insured. *The Journal of Ambulatory Care Management*, *30*(2), 159-170.

Sasso, A. T. L., & Byck, G. R. (2010). Funding growth drives community health center services. *Health Affairs*, *29*(2), 289-296.

New York view:
Blavin F, Blumberg L, Buettgebs M. Estimated New York State Savings Under the Patient Protection and Affordable Care Act (ACA). In. Washington, DC: Urban Institute Health Policy Center; 2012.

Review:
The Henry J. Kaiser Family Foundation. (2015). Medicare: A Primer. The Foundation. (skim)

The Henry J. Kaiser Family Foundation. (2013). Medicaid: A Primer. The Foundation. (skim)

Invited Guest: Diane Ferran MD, MPH Sr. Director, Clinical Quality Improvement Program, Community Health Center Association of New York State

November 2
Class 8: Evidence Based -
1) Class Objective: To understand what is meant by evidence based medicine and public health.

Please log onto: http://ebph.ihrp.uic.edu and read all 5 modules. Please take and submit Quiz 1 and Quiz 2 (on readings below) (electronically) before midnight on 11/17.

Scalise, D. (2004). Evidence Based Medicine. *Hospitals and Health Networks, 78*(12):33-37.

Eddy, D. M. (2005). Evidence-based medicine: a unified approach. *Health Affairs*, *24*(1), 9-17.

November 9
Class 9: Implementation Case study A draft and presentation due
Class Objective:
1) To understand key factors related to successful implementation.

Francke, A. L., Smit, M. C., de Veer, A. J., & Mistiaen, P. (2008). Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review. *BMC medical informatics and decision making, 8*(1), 38.

Powell, B. J., McMillen, J. C., Proctor, E. K., Carpenter, C. R., Griffey, R. T., Bunger, A. C., et al. (2012). A compilation of strategies for implementing clinical innovations in health and mental health. *Medical Care Research and Review, 69*(2), 123-157.

Fixsen, D. L., & Mental, L. d. l. P. F. (2005). *Implementation research: A synthesis of the literature*: Tampa, FL: National Implementation Research Network. (Skim)

November 16:
(Case B released)
Class 10: Midterm

November 23
Class 11: Management and Performance Improvement
Class Objective:
1) To understand health services management challenges and opportunities.

Management strategies:
Herzlinger, R. E. (2006). Why innovation in health care is so hard. *Harvard Business Review, 84*(5), 58.

Bohmer, R. M. J. (2010). Managing The New Primary Care: The New Skills That Will Be Needed. *Health Affairs, 29*(5): 1010-1014.

Hill, L. A. (2007). Becoming the boss. *Harvard Business Review, 85*(1), 48.

Strategies to improve performance:
Grol, R. & Grimshaw, J. (2003). From best evidence to best practice: effective implementation of change in patients' care. *The Lancet,* 362(9391): 1225-1230.

Fung, C. H., Lim, Y.-W., Mattke, S., Damberg, C., & Shekelle, P. G. (2008). Systematic review: the evidence that publishing patient care performance data improves quality of care. *Annals of Internal Medicine, 148*(2), 111-123.

Flodgren, G., Eccles, M. P., Shepperd, S., Scott, A., Parmelli, E., & Beyer, F. R. (2011). An overview of reviews evaluating the effectiveness of financial incentives in changing healthcare professional behaviours and patient outcomes. *Cochrane Database Syst Rev, 7*. (Summary Only)

Cassel, C. K., Conway, P. H., Delbanco, S. F., Jha, A. K., Saunders, R. S., & Lee, T. H. (2014). Getting more performance from performance measurement. *New England Journal of Medicine, 371*(23), 2145-2147.

Himmelstein, D. U., Ariely, D., & Woolhandler, S. (2014). Pay-for-Performance: Toxic to Quality? Insights from Behavioral Economics. *International Journal of Health Services, 44*(2), 203-214.

Reference only:
Walshe, K., & Rundall, T. G. (2001). Evidence-based Management: From Theory to Practice in Health Care. *Milbank Quarterly, 79*(3), 429-457.

November 30
Class 12: Electronic Health Systems
Class Objective:

1) To understand current data and information needs and issues facing health services management under health reform.

Why EHRs?
Blumenthal, D., & Tavenner, M. (2010). The "meaningful use" regulation for electronic health records. *New England Journal of Medicine*, *363*(6), 501-504.

Chen, C., Garrido, T., Chock, D., Okawa, G., & Liang, L. (2009). The Kaiser Permanente Electronic Health Record: transforming and streamlining modalities of care. *Health Affairs*, *28*(2), 323-333.

How perform:
Lau, F., Kuziemsky, C., Price, M., & Gardner, J. (2010). A review on systematic reviews of health information system studies. *Journal of the American Medical Informatics Association*, 17(6), 637-645.

Poissant, L., Pereira, J., Tamblyn, R., & Kawasumi, Y. (2005). The impact of electronic health records on time efficiency of physicians and nurses: a systematic review. *Journal of the American Medical Informatics Association*, *12*(5), 505-516.

Sidorov, J. (2006). It ain't necessarily so: the electronic health record and the unlikely prospect of reducing health care costs. *Health Affairs*, *25*(4), 1079-1085.

Romano, M. J., & Stafford, R. S. (2011). Electronic health records and clinical decision support systems: impact on national ambulatory care quality. *Archives of Internal Medicine, 171*(10), 897-903.

Han, Y. Y., Carcillo, J. A., Venkataraman, S. T., Clark, R. S., Watson, R. S., Nguyen, T. C., ... & Orr, R. A. (2005). Unexpected increased mortality after implementation of a commercially sold computerized physician order entry system. Pediatrics, 116(6), 1506-1512.

What needed:

Krist, A. H., Beasley, J. W., Crosson, J. C., Kibbe, D. C., Klinkman, M. S., Lehmann, C. U., . . . Pace, W. D. (2014). Electronic health record functionality needed to better support primary care. *Journal of the American Medical Informatics Association, 21*(5), 764-771.

Friedman, D. J., Parrish, R. G., & Ross, D. A. (2013). Electronic health records and US public health: current realities and future promise. *American journal of public health, 103*(9), 1560-1567.

December 7
Class 13: Parity Implications: Mental Health and Substance Abuse Treatment: Systems, Structures &Workforce
Class Objective:

1) To understand substance abuse in the context of chronic disease and the role of integration.

What is addiction and how is it treated:
McLellan, A. T., D. C. Lewis, et al. (2000). Drug dependence, a chronic medical illness: implications for treatment, insurance, and outcomes evaluation. *JAMA, 284*(13): 1689-1695.

NIDA. (2009). *Principles of Drug Addiction Treatment*. Washington, D.C.: U.S. Department of Health and Human Services.

Treatment capacity:
McLellan, A. T., D. Carise, et al. (2003). Can the national addiction treatment infrastructure support the public's demand or quality care? *Journal of Substance Abuse Treatment, 25*: 117-121.

Ryan, O., Murphy, D., Krom, L. (2012). *Vital Signs: Taking the Pulse of the Addiction Treatment Workforce, A National Report, Version 1.* Kansas City, MO: Addiction Technology Transfer Center National Office in residence at the University of Missouri-Kansas City. (Executive Summary only)

Health reform and integration:
Buck, J. A. (2011). The looming expansion and transformation of public substance abuse treatment under the affordable care act. *Health Affairs, 30*(8).

Mauer, B.(February, 2006) Behavioral health/Primary care integration: The four quadrant model and evidence-based practices. Rockville, MD: National Council for Community Behavioral Healthcare.

Crowley, R. A., & Kirschner, N. (2015). The Integration of Care for Mental Health, Substance Abuse, and Other Behavioral Health Conditions into Primary Care: An American College of Physicians Position Paper. *Annals of internal medicine*.

December 14
Class 14: Long Term Care Case study B and presentation due
Class objective:

1) To understand a variety of long term care needs and service delivery models
2) To understand the potential impact of health reform on long term care services

Background:
Feder, J., Komisar, H. L., & Niefeld, M. (2000). Long-term care in the United States: An overview. *Health Affairs*, *19*(3), 40-56.

Associated Press & NORC Center for Public Affairs Research. (2015). Long-term Care in America: American's outlook and planning for future care. Retrieved August 19, 2015, from http://www.longtermcarepoll.org/PDFs/LTC%202015/AP-NORC-Long-Term%20Care%20in%20America%202015_FINAL.pdf

Levine, S.A., Boal, J., Boling, P.A. (2003). Home care. *Journal American Medical Associatio,. 290* (9):1203-1207.

Gazelle, G. (2007) Understanding hospice --- An underutilized option for life's final chapter. *The New England Journal of Medicine 357*:321-324.

Strategies:
Bodenheimer, T. (1999). Long-term care for the frail elderly people – The On Lok model.
The New England Journal of Medicine, *341*(17):1324-1328.

Amaral, M. (2010). "Does substituting home care for institutional care lead to a reduction in Medicaid expenditures?" *Health Care Management Science,* 13(4): 319-333.

Miller, S. (2010). With health reform, long-term-care option becomes law.

http://www.shrm.org/Publications/HRNews/Pages/LongTermOption.aspx

New York view:
Samis, S., Detty, A., Birnbaum, M. (2012) Implementing Long-Term Care Reform in New York's Medicaid Program. Medicaid Institute; United Hospital Fund. Pp 1-27.

Invited guest: Joanne Kerwin Ph.D., MMHS, PT, Manager, Quality/Performance Improvement, CareGroup Home Care, Mt Auburn Hospital, Cambridge MA.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Brooklyn College
HNSC 7144X Health Economics
3 Credits
Fall 2015

Time and location	Boylan Hall, Room 5143. Tuesdays, 6:30 PM- 8:10 PM
Instructor	Emanuel Thorne, PhD 718-951-5153 ethorne@brooklyn.cuny.edu
Office hours	Tuesdays: 4-6pm 501 Whitehead Hall
Course website	N/A
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Economic analysis of the structure, performance, and government policy in the health care sector of the economy. Demand and supply of health care services, the role of third party payers, and the public policy debate over government reform of the health care system. Microeconomic, econometric, and political philosophy concepts relevant to issues of justice in health care.
Course prerequisites	N/A
Course format	Seminar
Required reading and resources	• Phelps, Charles, Health Economics, Addison-Wesley, 5th Edition. • Rice, Thomas, The Economics of Health Reconsidered, 2015 • Supplemental Material from Rosen Public Finance • There will be additional material on Health Policy and the Affordable Care Act of 2010 and case studies in cost-benefit analysis, rationing of health care, and econometric methods – See Appendix
Suggested reading and resources	N/A

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Demonstrate knowledge of political, economic and social context of health policies	• Read, comprehend, and critique the literature in health economics • Analyze basic microeconomic models of household and firm behavior in health, medical care, and health insurance, and make connections across these models	Homework; Term paper; Final exam
Examine, analyze and explain the intended and unintended consequences of national policies and reforms	• Explain key incentives and tradeoffs driving behavior in health and health care • Identify effects of health care policies on households, firms, and other sectors of the economy • Analyze strengths and weaknesses of health care policies and reforms	Homework; Term paper; Final exam
Discuss the legal and ethical bases for public health and health services	• Describe tradeoffs associated with public health and health services policies • Critique strengths, limitations, and assumptions of public health and health services research and policy	Homework; Term paper; Final exam

Course Assessments

Graduate students will be required to deepen their understanding of the subject by submitting a term paper. Students are expected to prepare thoroughly for each session, to submit all written materials on time, to achieve graduate school quality standards, and to participate actively and constructively in class. Problems will be assigned as appropriate and each student is responsible for being able to solve them.

Grading

Evaluation criteria

Course grades will be based on class participation and home work (15%), Final Exam (50%), and a term paper (35%).

The relative weight of each course component is as follows:

Assessment	Weight
Class participation & homework	15%
Final exam	50%
Term paper	35%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion

of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Graduate Bulletin and the Program Director for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

Describe the policy for attendance and class participation.

Late/incomplete submission of assignments

Provide a statement about whether late or incomplete assignments are accepted and under what conditions.

Make-ups, rewrites, and extra credit

Provide a statement about whether make-ups, rewrites, or extra credit assignments are allowed and under what conditions.

Expectations of students

Students are expected to prepare thoroughly for each session, to submit all written materials on time, to achieve graduate school quality standards, and to participate actively and constructively in class. Problems will be assigned as appropriate and each student is responsible for being able to solve them.

Expectations for the instructor

Accessibility
In order to receive disability-related academic accommodations, students must first register with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services,

Ms. Valerie Stewart-Lovell, at (718) 951-5538. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Academic integrity
The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Brooklyn College procedure for implementing the policy can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

Course Schedule

Schedule is subject to change throughout the semester.

Week 1: Introduction to Health Economics
Phelps Ch 1

Week 2: Review of Economic Concepts and Statistical Analysis
Phelps Appendix, Econometrics Handout, and Phelps Chapter 2

Weeks 3-5: Production of Health & The Demand for Medical Services
Phelps Chapters 3-5

Week 6 -7: Economic Theory of Insurance
Phelps Chapter 10-11

Week 8: Role of Government in a Market Economy
Handout from Rosen

Week 9: Social Insurance: In Theory and Practice
Handouts Rosen (Public Finance) Chs 9 & 10

Week 10: Cost/Benefit Analysis: In Theory and as Applied to Health Care
Handout Rosen Ch 11

Week 11: Justice in Health Care
Rice, Chapter 9

Week 12: Health Care Policy I: Evaluation of Proposals for Reform
Handouts

Week 13: Health Care Policy II: International Comparisons
Read handouts

Week 14: Economics of Organ Transplantation
Thorne handout

Supplemental Reading List

Access to health care

- Kaiser Foundation (2010). "The Uninsured: A Primer." http://www.kff.org/uninsured/upload/7451-06.pdf.
- Kaiser Foundation (2010). "Medicare: A Primer." http://www.kff.org/medicare/upload/7615-03.pdf.
- Kaiser Foundation (2010). "Medicaid: A Primer." http://www.kff.org/medicaid/upload/7334-04.pdf.

Quality of health care

- E. Docteur and R. Berenson for the Urban Institute and RWJ Foundation (2009). "How Does the Quality of US Health Care Compare Internationally?" http://www.urban.org/uploadedpdf/411947*ushealthcare*quality.pdf.
- GapMinder World (2012). Find the US on the following graphs by hovering over the circles and compare its performance to other OECD countries (in light green): infant mortality (www.bit.ly/Kpa1h3), life expectancy (www.bit.ly/MSsLuR).
- Institute of Medicine (2000). "To Err Is Human: Building a Safer Health System." http://www.nap.edu/openbook.php?record_id=9728&page=1.

Cost of US health care in international context

- Kaiser Foundation (2009). "Health Care Costs: A Primer." http://www.kff.org/insurance/upload/7670_02.pdf.
- McKinsey Global Institute (2008). "Accounting for the cost of US health care: A new look at why Americans spend more."http://www.mckinsey.com/Insights/MGI/Research/Americas/Accounting*for*the*cost*of*US*health_care.
- M. Pauly (2007). "The Truth about Moral Hazard and Adverse Selection." http://www.maxwell.syr.edu/uploadedFiles/cpr/publications/pb36.pdf.

Growth in US health care costs

- CBO (2008). “Technological Change and the Growth of Health Care Spending.”http://www.cbo.gov/ftpdocs/89xx/doc8947/01-31-TechHealth.pdf.
- D. Cutler and M. McClellan (2001). “Is Technological Change In Medicine Worth It?” In Health Affairs, vol. 20 no. 5. http://content.healthaffairs.org/content/20/5/11.full.

Health care malpractice

- M. Mello for the RWJ Foundation (2006). “Understanding medical malpractice insurance: A primer.”http://www.rwjf.org/pr/synthesis/reports*and*briefs/pdf/no8_primer.pdf.
- CBO (2009). “CGO’s Analysis of the Effects of Proposals to Limit Costs Related to Medical Malpractice (‘Tort Reform’).” http://www.cbo.gov/ftpdocs/106xx/doc10641/10-09-tort_reform.pdf.
- M. Mello and A. Chandra in the New York Times (2009). “The Cap Doesn’t Fit.” http://www.nytimes.com/2009/07/12/opinion/12mello.html?_r=1.

History of health care reform

- Kaiser Foundation (2009). “National Health Insurance—A Brief History of Reform Efforts in the US.” http://www.kff.org/healthreform/upload/7871.pdf.
- CBO (2008). “Key Issues in Analyzing Major Health Insurance Proposals.” http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/99xx/doc9924/12-18-keyissues.pdf.
- E. Goodridge and S. Arnquist for the New York Times (2010). “A History of Overhauling Health Care.”http://www.nytimes.com/interactive/2009/07/19/us/politics/20090717*HEALTH*TIMELINE.html.
- C. Mery, A. Liepert and D. Cooke for the American College of Surgeons (2010). “The modern history of US health care reform.”http://www.facs.org/fellows_info/bulletin/2010/mery0710.pdf.

The ACA and access to health care

- Kaiser Foundation (2011). “Summary of New Health Reform Law.” http://www.kff.org/healthreform/upload/8061.pdf.
- Department of Health and Human Services (2012). “What’s Changing and When.” http://www.healthcare.gov/law/timeline/.
- Kaiser Foundation (2010). “Explaining Health Care Reform: Questions About Health Insurance Subsidies.” http://www.kff.org/healthreform/upload/7962-02.pdf.
- Use the Massachusetts Health Connector to “buy” insurance. https://www.mahealthconnector.org/portal/site/connector/ . (Use zip code 02138. When you get to the message that “Enrollment is closed”, click “Browse Now” under the heading “Just window shopping?”)

The ACA and cost control

- P. Orszag and E. Emanuel (2010). “Health Care Reform and Cost Control.” http://www.nejm.org/doi/full/10.1056/NEJMp1006571. In the New England Journal of Medicine 363; 7.
- CBO (2009). “An Analysis of Health Insurance Premiums Under the Patient Protection and Affordable Care Act.” http://www.cbo.gov/ftpdocs/107xx/doc10781/11-30-Premiums.pdf.
- J. Gruber (2009). “The House Proposal Lowers Non-Group Premiums.” http://www.healthpolicyproject.org/Publications_files/Business/2010/GruberHousenongroup11-2-1.pdf.
- J. Gruber (2011). “The Impacts of the Affordable Care Act: How Reasonable Are the Projections?” NBER Working Paper #17168. http://economics.mit.edu/files/6829.
- Centers for Medicare and Medicaid Services (2012). “The Affordable Care Act: Lowering Medicare Costs by Improving Care.”http://www.cms.gov/apps/files/ACA-savings-report-2012.pdf.
- S. Harrington (2009). “The Health Insurance Reform Debate.” https://hcmg.wharton.upenn.edu/files/?whdmsaction=public:main.file&fileID=1594.

The ACA and health care delivery

- H. Komisar, J. Feder and P. Ginsburg for the Center for American Progress. "'Bundling' Payment for Episodes of Hospital Care."http://www.americanprogress.org/issues/2011/07/pdf/medicare_bundling.pdf.
- J. Gruber (2011). "The Impacts of the Affordable Care Act: How Reasonable Are the Projections?" NBER Working Paper #17168. http://economics.mit.edu/files/6829.
- M. Merlis for AcademyHealth (2011). "The Affordable Care Act and Employer-Sponsored Insurance for Working Americans."http://www.academyhealth.org/files/nhpc/2011/AH_2011AffordableCareReportFINAL3.pdf.
- H. Aaron (2011). "The Independent Payment Advisory Board – Congress's 'Good Deed'." In New England Journal of Medicine 364.http://www.nejm.org/doi/full/10.1056/NEJMp1105144.
- Association of American Medical Colleges (2010). "Independent Payment Advisory Board IPAB (IPAB)."https://www.aamc.org/advocacy/medicare/153896/independent*payment*advisory*board*ipab.html.

The ACA and innovation

- McKinsey & Company (2011). "Cross-currents in the health economy." Download the full report at the bottom ofhttp://healthreform.mckinsey.com/Insights/Latest*thinking/Cross*currents*in*the*health*economy.
- J. Cacciotti and M. Mozeson for Oliver Wyman. "How ACA Could Transform the US Pharmaceutical Marketplace."http://www.oliverwyman.com/media/ACA*and*the*Pharma*Marketplace.pdf.@afrakt

City University of New York
School of Public Health
Brooklyn College

HNSC 7163X: Conducting Community Needs and Strengths Assessments
3 credits
Fall 2015

Catalogue description	Introduction to community needs and strengths assessments. Identification, gathering, synthesis and presentation of population (neighborhood) specific data related to a public health issue or condition using technologically appropriate presentations. Analysis of multiple data sources including: U.S., Census, State, county, and neighborhood quantitative data as well as key informant interviews and focus groups.
Prerequisite	Nine credits of core courses in MPH or MA Community Health Education. Graduate students are welcomed and may be enrolled with the permission of the instructor.
Course meets	Tuesdays 6:30PM-9PM, Whitehead Hall 508
Instructor	Gordon Shen, PhD, SM Assistant Professor of Health Care Policy, Management, and Administration
Email	gshen@brooklyn.cuny.edu
Phone	(718) 951-5000 x2059
Office	Ingersoll Hall 0119
Office hours	Tuesdays, 9:00PM-10:00PM, or by appointment.
Required books	Petersen, Donna J., and Greg R. Alexander. *Needs Assessment in Public Health: A Practical Guide for Students and Professionals*. Springer Science & Business Media; 2001. ("PA") *This book is available as an electronic resource through the Brooklyn College library website.
Other required reading materials	See readings listed from p.9-p.14, articles posted on Blackboard (https://bbhosted.cuny.edu).
Recommended books	• Altschuld, James W., and David Devraj Kumar. *Needs Assessment: An Overview*. Sage Publications, 2009. ("AK") • Royse, David, Michele Staton-Tindall, Karen Badger, and J. Matthew Webster. *Needs Assessment*. Oxford University Press, 2009. ("RSBW")

Syllabus content

- **COURSE OVERVIEW**
- **SCHOOL COMPETENCIES AND COURSE LEARNING OBJECTIVES**
- **COURSE POLICIES**

- **COURSE SCHEDULE**

COURSE OVERVIEW

Assessment is one of the three core functions of public health: assessment, assurance, and policy development. A needs/strength assessment is the beginning of a larger process of designing, implementing, and evaluating programs and policies. As such, this course is part of a trilogy of courses offered by the Health and Nutrition Sciences Department: program planning and evaluation. A needs/strength assessment is generally carried out to measure the gaps between current conditions and desired conditions. Needs/strength assessment is an end-driven effort in that data are collected to clarify, identify, and understand problems, then options are developed, and a subset of them are implemented involving the mobilization of finite resources to address said problems. The goal can be to improve the wellbeing of clients and their families, education and training of staff, organizations, or lay communities.

A community needs/strengths assessment is a culmination of gathering data and engaging the community on focused actions to achieve the goal of improving the population health status. A community needs/strengths assessment can have different starting points:

- Aimed to *discover* strengths and weaknesses within a focal community and develop solution;
- Seek to address an *already known problem*, possibly of unknown magnitude, facing the community;
- Needs of an organization already serving the community (e.g. domestic violence centers, community health clinics).

Regardless of the starting point, community needs/strength assessments are generally executed in the following manner: planning and organizing a needs/strength assessment, data collection, data analysis, and sharing the results with the community vis-à-vis a needs/strength assessment report. Stakeholders are to be involved throughout the needs/strength assessment process including: community leaders, local government, advocacy groups, consumer, or a combination of them so information can be gathered, vetted and findings can be quickly used.

This course is designed for students to develop skills measuring health problems in communities, planning for health services, and advocating or making decisions about the distribution of community health resources. This class will have more emphasis on practical skills than theory, but students will nonetheless become familiar with the theory related to ecologically valid, assets-based and needs-based community health assessments and how to translate them into everyday public health or healthcare practice. Finally, the course will explore the social justice issues around community partnership by capturing and framing health issues found in a given community. Outside of the classroom, students will have the opportunity to work with a community organization to apply the knowledge and skills acquired through this course. A team of students will be partnered with a community organization to develop a tailored plan to collect data, conduct analysis, and formulate recommendations for programs and practice.

SCHOOL OF PUBLIC HEALTH COMPETENCIES AND COURSE LEARNING OBJECTIVES

Competencies	Course Learning Objectives	Sessions and Assessments
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be addressed as part of the following course sessions and assessments:*
1. Apply approaches for improving the health status of populations, including a specific initiative for a target population.	• Describe leading interventions, policies, and/or theories that engender individual, organizational, and community-level change. • Weigh the strengths and limitations of social and behavior-based interventions, policies, and theories. • Develop strategies to reduce disparities in population health, as informed by evidence.	Sessions: Week 1, Week 2, Week 11 Assessment: Background section of work plan and needs/strength assessment report. Readings are curated so that theoretical and conceptual pieces are reinforced with case examples.
2. Apply principles of planning, development and practice of organizational and community initiatives that relate to program planning, policy formulation or research.	• Describe the purpose, process, and components of a needs assessment • Develop a needs assessment plan, which includes using a mix of epidemiological, social, qualitative, and/or quantitative methods to collect primary and/or secondary data, analyzing data, and coming up for recommendations based on the results • Assess strengths, weaknesses, opportunities and challenges of different strategies, programs, research, and policies currently in place to address salience public health problems in a focal community. • Identify basic social and behavioral theories, concepts, and logic models that explain differences in the distribution of health in the United States. • Practice ethics and respect when applying principles of public health policy and practice, especially when	Sessions: Week 1, Week 2 Assessment: Rationale section of work plan and needs/strength assessment report. Readings are curated so that theoretical and conceptual pieces are reinforced with case examples.

Competencies	Course Learning Objectives	Sessions and Assessments
	building consensus with community-based stakeholders.	
3. Use audience-appropriate written and oral communication to convey public health information.	• Assess available ways to disseminate the needs assessment proposal (at the beginning) and report (at the end) to the target audience(s). • Identify target audience(s) who can play a role in health promotion and disease prevention within a focal urban or rural community. • Describe their respective, possibly overlapping roles (e.g. education, health care, environmental protection, criminal justice, food and nutrition) in promoting health and preventing disease within the population.	Session: Week 12 Assessment: Present findings in writing, via the needs/strength assessment report, to inform the community. Oral communications of the same content is possible with permission of community-based partner organization.
4. Develop collaboratively public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served.	• Define and describe different study designs. • Develop or enhance skills for problem solving, conflict-resolution, decision-making, and evaluation of public health issues. • Engage individual(s), organization(s), and community or communities in a participatory, collaborative fashion, thus bringing resources to bear on their problem(s). • Identify beliefs, assets, and needs at the individual(s), group(s), organization(s), community, and/or government(s) that inform public health interventions.	Sessions: Week 2, Week 12 Assessment: Consultations with both instructor and supervisor at the community-based organization before finalizing work plan, data collection, and needs/strength assessment report.
5. Differentiate among evaluation methods in relation to their strengths, limitations and appropriate uses.	• Evaluate the different research methods that could be used to address a specific public health problem. • Find relevant examples in the grey and/or peer-reviewed literature. • Select a method or use a mixture of methods to	Sessions: Week 3, Weeks 4-8, Week 9 Assessment: Choice of methods, sources, elements, and indicators as described in data collection plan. Students will be given the opportunity to design and implement an

Competencies	Course Learning Objectives	Sessions and Assessments
	answer the problem at hand, and give a justification to support decision.	assessment (e.g. interview, focus group) tool.
6. Analyze the effects of political, social and economic policies on public health systems at the local, state, national and international levels.	• Diagnose needs and strengths of a focal urban or rural community. • Describe pathways through which the environment one resides in affects health across the lifespan. • Identify major economic, political, and social forces –nationally or internationally- that shape the healthcare system and, in turn, population health status. • Analyze the impact of demographic characteristics (i.e. socioeconomic status, race and ethnicity, gender and sexual orientation) on need, supply, and demand for health services.	Sessions: Week 1, Week 11 Assessment: Description on contextual forces in work plan and needs/strength assessment report.

COURSE POLICIES

Assignments

Submission mode

Be sure to put a title, your name, and date at the top of each assignment. I expect assignments to be submitted electronically, specifically via Blackboard at the *beginning* of the day or relevant session. See guidelines for email correspondence in the next section.

Formatting

- Place title, name, and date (in that order) on the upper left corner of p.1
- Times New Roman or Garamond, 12pt font
- Single-spaced
- 1" margins all around
- Page numbers on the bottom right corner of each page
- References should appear as the last section in APA citation format (http://www.apastyle.org/), preferably with a section break inserted

Failure to format submissions according to the stated guidelines will result in an automatic half-grade reduction for the written assignment.

Communication*

Email Correspondence: The subject line of your email should be formatted as:

- For assignments: "HNSC 7163X – [the name of the assignment as it appears in this syllabus]."
- For all other matters: "HNSC 7163X – [purpose of the email, e.g. "Office Hours", "Appointment Request"]."

Failure to format emails according to the above guidelines might result in a delay. Please allow 24-48 hours for a response.

*Note that email is a *formal* means of communication with superiors and colleagues in the context of the university or place of employment. As such, get into the habit of reading your e-mail twice before send-off (or undo it as soon as a mistake is spotted), sign off every message, and always use polite language, capital letters where appropriate, punctuation marks, grammar, and syntax. E-mails should begin with greetings and end salutations. Please minimize the use of abbreviations and acronyms, and avoid using slang.

Academic Integrity*

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete test of the CUNY Academic integrity Policy and the Brooklyn College Procedures for implementing the policy can be found at

http://www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation. A copy of the Faculty Action Report is appended to this syllabus, which I WILL use to report ALL instances of cheating, plagiarizing, or any other type of academic dishonesty.

You should carefully and thoroughly read the section entitled "Academic Regulations and Procedures" in the Brooklyn College Graduate Bulletin (http://www.brooklyn.cuny.edu/web/off_registrar/141024_2014-15_Graduate_Bulletin.pdf) for a complete listing of academic regulations of the College.

*Note that all of the assignments due in this course are subject to screening through SafeAssign, an anti-plagiarism tool.

Assistance with research and writing

The library maintains a collection of website links within the Research & Writing Help section that can assist you with proper citation format and paraphrasing and quoting other authors: http://library.brooklyn.cuny.edu. The Learning Center has writing tutors available to help you with your writing: http://lc.brooklyn.cuny.edu

Accessibility

In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with Ms. Valerie Stewart-Lovell, Director of the Center for Student Disability Services, at 718-951-5538. If you have already registered with the Center for Student Disability Services, please provide me, your professor, with the course accommodation form and discuss your specific accommodation with me.

Class citizenship and Rules of Conduct

Attendance

- Students are expected to attend all class sessions. In cases of personal emergency or illness I, the professor, must be notified.
- See p. 46 of the Graduate Bulletin regarding non-attendance due to religious beliefs. I, as the professor, must be notified in advance.
- Assignments are based on lectures and activities, as well as course readings. If you are absent from class it is *your responsibility* to contact a classmate for notes and other materials you missed.
- A record of attendance will be maintained with attendance taken intermittently throughout the semester.
- Written assignments must be submitted *prior* to class. Absence from the session during which an assignment is due *does not* excuse or preclude you from turning in the assignment.

Lateness and Early Exits

- Please enter and exit the class with the least amount of disruption.

- You are expected to arrive on time for class. Tardiness (and absences) are disruptive to fellow students and your professor.
- Persistent tardiness and/or early exits will result in a grade reduction.

Other Classroom Etiquette

- Use of cell phones and other electronic media (e.g. video game consoles) is not permitted. Laptops or iPads that are used to take notes or making presentations are allowed; however, if your device is viewed as disruptive, you will be asked to put it away.
- Respect others and their opinions. Constructed a well-informed argument if you disagree.
- Be an avid participator in class discussions.

Grading

Grading for the course will be based on a scale, as opposed to a curve. Assignment due dates are noted in the course schedule section of this syllabus.

Students will be evaluated based on the following criteria:

Assignment	**Due date**	**Points**
Work plan	Sept. 15	15
Data collection plan (draft)	Oct. 1	10
Data collection plan (revised)	Oct. 27	15
Peer evaluation form (set 1)	Oct. 27	5
Needs/strength assessment report (draft)	Nov. 24	20
Needs/strength assessment report (revised)	Dec. 8	25
Peer evaluation form (set 2)	Dec. 8	5
In-class presentation	Dec. 8	5
Class participation		10
Total		**110**

Letter grading

The grading system (letter grad, quality points, percentage) for this course follows guidance in the Graduate Bulletin:

A+	4.0	97.5 - 100%	B+	3.3	87.5%-89.9%	C+	2.3	77.5%-79.9%
A	4.9	92.5 – 97.4%	B	3.0	82.5%-87.4%	C	2.0	70.0%-77.4%
A-	3.7	90 – 92.4%	B-	2.7	80.0%-82.4%	F	0	<70%

Extensions for assignments are not given unless planned with the professor *at least two weeks in advance* of the specified due date, otherwise the deadlines are firm and enforced by the date and time stamp on your email. Late or incomplete submission of assignments are not accepted. The

assignments come together as a gestalt, so missing any assignment would render your final product incomplete. No make-ups, rewrites, and extra credit.

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Graduate Bulletin and the Program Director for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

COURSE SCHEDULE

Topic	Activities	Assignments
Week 1 – September 1		
Introduction	What is needs/strength assessment? • Needs and strength assessment overview: purpose, scope, and overview of conducting a community health assessment | Theories and logic models | Social justice, expectations of community partnerships, and ethics of assessment. • House-keeping: Review syllabus • The ways forward: create teams, and each team selects an organization and problem for assessment. *Work plan outline: roles, responsibilities, individual time commitment to team outside of the classroom, time frames for major activities of the assessment for the rest of the semester. Useful project management tools.	Schedule note: Sept. 2 is the last day to add a course.
Week 2 – September 8 (Meet in library Room 120)		
The makings of a work plan	What goes into a needs and strength assessment? Define the scope based on: a) Issue to be assessed, including community members and geographic area of impact → A problem statement substantiated by annotated literature search; b) Community agency's ("partner") vision, mission,	***Due on Sept. 15 via Blackboard: Semester work plan (will be returned to your team with comments by Sept. 21).*** Readings: PA Ch. 2, 8; Altschuld & Watkins, 2014; Wright et al., 1998 Optional readings: PA Ch. 1; RSBW Ch.1, 2

Topic	Activities	Assignments
	goals, and objectives (used to guide literature search); c) Strategy to marry (a) and (b); d) Information indicating assets, resources, conditions related to (c).	Reminder: Schedule a meeting with your organization during week 3, or week of September 20th to go over your work plan. Schedule notes: • No classes scheduled on Tuesday, Sept. 15 and Tuesday, Sept. 22. Our next meeting will be Friday, Sept. 25. • Sept. 15 is the last day to apply for Fall 2015 Graduation. • Sept. 16 is the last day to drop without a grade.
Week 3 – September 25 (Conversion day)		
Data Deep Dive	Data collection overview: • Prioritizing data collection needs according to what is essential to address key questions arising from the partner versus what is good to know for the scientific literature • Community scanning ("needs") vs. community mapping ("assets") • Mixed methods • Comparative advantage and resources required for each type of data collection • Community assessment that is cross-sectional versus longitudinal *Data collection plan's guidelines and worksheet.	Readings: PA Ch. 3, 5; Finifter et al., 2005; Murray & Graham, 1995; Sharpe et al., 2000 Optional readings: RSBW Ch. 3
Week 4 – September 29		

Topic	Activities	Assignments
		Due on Oct. 1 via Blackboard: Draft data collection plan (will be returned to your team with comments by Oct. 7).
Primary data – Part 1	Surveys	Readings: Williams & Wright, 1998 and pick <u>three</u> of the following: Mi et al., 2014; Coker et al., 2006; Hyun et al., 2006; Kenagy, 2005; Kwekkeboom, 2005; Jeal & Salisbury, 2004; MMWR, 2002; Barry et al., 2000; Zahner et al., 1992
Week 5 – October 6		
Primary data – Part 2	Interviews, photovoice, and focus groups	Readings: • Photovoice: Wang & Burris, 2007 and • Interview (pick <u>one</u>): Wongking et al., 2014; Ganz et al., 1987 and • Focus group (pick <u>one</u>): Anderson & Heyne, 2000; Tipping, 1998; Buttram, 1990 Optional readings: NYAM, 2014 and Frazer, ????; (both combined survey, interview and focus groups); Durham et al., 2014 and Wolin et al., 2012 (both interview-based); McClelland, 1994 (focus group)
Week 6 – October 13		
Primary data – Part 3	Community meetings and public forums	Readings: Kristjansson et al., 2015; Jordan et al., 1998; Lange, 1988
Week 7 – October 20 (Meet in library Room 120)		

Topic	Activities	Assignments
Secondary data – Part 1	Library Lab: Mapping and GIS: How it's used, when it's used, and relevant examples	Readings: Kazda et al., 2009; Scotch et al., 2006 and pick <u>two</u> of the following: Cardazone et al., 2014; Bazmore et al., 2010; Booza et al., 2010; Dulin et al., 2010; Geraghty et al., 2010; Holt et al., 2008; Hasan, 2005; Waring et al., 2005 Optional readings: MMWR, 1998 ***Reminder to teams: Schedule a meeting with your organization during week 8 or 9 to go over your data collection plan, and figure out logistics to collect data during the month of November.***
Week 8 – October 27 (Meet in library Room 120)		
Secondary data – Part 2	Library Lab: Public records, disease surveillance, public health and vital statistics, and archival data	***Due on Oct. 27 via Blackboard: Revised data collection plan and peer evaluation forms #1*** ****The revised data collection plan <u>must</u> include a revise and resubmit (R&R) table with three columns: commenter (instructor or supervisor), comment, and team response as reflected in revised data collection plan.*** Readings: UMSL MIMH, 2014; Bhatia & Seto, 2011; Asadi-Lari & Gray, 2005
Week 9 – November 3 (Meet in library Room 383)		
Data analysis	Library Lab: How to determine key findings? • Answer your key question(s) using descriptive and/or inferential statistics. • What are the limitations of the research methods you used?	Readings: RSBW Ch. 4; Greasley et al., 2007 Ch. 1; Lacy & Luff, 2001 Optional readings:

Topic	Activities	Assignments
	• Are the results generalizable to one community? *Key findings worksheet	• Qualitative data analysis: Bradley et al., 2007; Dey, 1993; Miles et al., 1985 • Quantitative data analysis: Visit UCLA IDRE website (http://www.ats.ucla.edu/stat/) for software and module relevant to your analysis Schedule notes: • Nov. 5 is Comprehensive Exams for Sabbath Observers • Nov. 7 is Comprehensive Exams • Nov. 9 is the last day to withdraw from a course with a W (non-penalty) grade.
Week 10 – November 10		
Needs assessment report	Needs assessment report: • Report findings; • Identify barriers to priority-setting; • Develop post-assessment plan • Adopt measures that can be adopted to help define and track post-assessment strategy; • Give recommendations for community action or incremental program-/project-/policy-specific improvement	Readings: PA Ch. 6, 7, 9; NYSDPH DSRIP, 2014 (slides, webinar optional) Optional readings: RSBW Ch. 5; HOPE SF, 2013; Marshall et al., 2000
Week 11 – November 17		
Context	Socio-political context, health equity	Readings: Carrillo et al., 2011; MMWR, 2006; Billings & Cowley, 1995; Donaldson & Mooney, 1991
Week 12 – November 24		

Topic	Activities	Assignments
Closing out	Disseminate findings with the community via community meetings, press releases, website, brochures, etc.. *Criteria for evaluating class presentations	***Due on Nov. 24 via Blackboard: Draft needs/strength assessment report (will be returned to your team with comments by Dec. 1).*** Readings: PA Ch. 4; Stevens & Gillam, 1998 Reminder to teams: Schedule a meeting with your organization after Thanksgiving break to share your findings and preliminary needs/strength assessment report.
Week 13 – December 1		
	Thanksgiving Holiday – No Classes	Schedule notes: • Dec. 2 is language exams • Dec. 7 is the last day to resolve Spring and Summer 2015 incomplete grade(s) (INC).
Week 14 – December 8		
	Class presentations* *Presentations will be reviewed for specificity, relevance, accuracy, usability, as well as coherence with needs/strength assessment report.	***Due on Dec. 8 via Blackboard: Revised needs/strength assessment report and peer evaluation forms #2*** ****The needs/strength assessment report must include a revise and resubmit (R&R) table with three columns: commenter (instructor or supervisor), comment, and team response as reflected in revised needs/strenght assessment report.***
December 15 (Reading Day) & December 22 (Final Examinations)		Schedule notes: • Dec. 23 is the last day to file for Maintenance of

Topic	Activities	Assignments
		Matriculation. • Jan. 4 is the last day to file approved thesis.

Appendix: Brooklyn College Faculty Action Report for Incidents of Academic Dishonesty



Print Form

BROOKLYN COLLEGE

Faculty Action Report Form for Incidents of Academic Dishonesty

If a faculty member, upon investigation, confirms that a suspected violation of the CUNY Policy on Academic Integrity has occurred and/or if the student admits to the violation, the faculty member **must** report the violation by completing and submitting a FAR Form.

The form should be forwarded to the appropriate Academic Integrity Official. For a violation in an undergraduate course send the form to Mr. Patrick Kavanagh (3208 Boylan Hall); for a violation in a graduate course send the form to Professor Philip Gallagher (3227 Boylan Hall).

A. Information about the Incident

Student Name: _____ Student ID#: _____

Date of Incident: ____ / ____ / ____ Type of Incident: ☐ Cheating ☐ Plagiarism ☐ Other

Description of Incident (please be specific): _____

_____

_____

Indicate the outcome of your discussion of the violation with the student: _____

_____

_____

Course Title: _____ Course Number: _____ Section: _____

Instructor Name: _____ Dept: _____

Phone: _____ E-mail: _____

B. Academic (Grade) Sanction

What academic sanction are you imposing?

☐ Failing Grade on Exam/Assignment ☐ Failing Grade for Course

☐ Other (please explain): _____

Did the student accept this sanction: ☐ Yes ☐ No, please explain: _____

_____

C. Disciplinary Complaint Option

Are you filing a disciplinary complaint with the Office of the Dean of Student Affairs for investigation and possible disciplinary charges?

☐ No

☐ Yes - Please be sure to enter a PEN grade for the course and to forward the *Disciplinary Complaint Form* and all supporting documentation to the Office of Student Affairs.

Instructor Signature _____ Date: ____ / ____ / ____

* Copies of all disciplinary forms are available for print-out at http://www.brooklyn.cuny.edu/bc/offices/studlife/ (under the category "Get It Right").

Revised 9/2007

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Brooklyn College
Department of Health and Nutrition Sciences

HNSC 7920X: Supervised Fieldwork in Public Health

3 Credits - Fall 2015

Time and location	Thursdays, 6:30-9:00 – Room 3424 Ingersoll Hall
Instructor	Bill Stackhouse, Ph.D. Adjunct Assistant Professor **Best to contact by email.** • Office: Ingersoll 4423 • Phone: 718.951.5000 x5026 (leave a message & you'll get a call or e-mail response) • E-mail: RWStackhouse@brooklyn.cuny.edu
Office hours	By appointment – before or after class.
Course website	https://bbhosted.cuny.edu/webapps/blackboard/
Support resources	For technical assistance, contact the Helpdesk. Academic support services writing skills assistance are available.
Course description	Students carry out 180 hours of supervised field work that is intended to bridge academic preparation and public health practice. Knowledge and skills from the core MPH and specialization courses are applied in a public health agency, community organization or other setting relevant to the student's academic background, specialization and career expectations. This is accomplished under the supervision and guidance of an experienced preceptor. Field-based hours are implemented with classroom and individual meetings along with online communication. Aside from deliverables required by the preceptor, the student develops a reflection paper, a self-evaluation and a capstone proposal.
Course prerequisites	Completion of at least 18 MPH credits that include Health and Nutrition Sciences 7120X, Health and Nutrition Sciences 7150X, and two courses in the student's area of specialization.
Course format	Supervised individual internship projects in a community program or health agency. Weekly seminars, except when noted in the posted schedule. NOTE: the Internship Manual for Fall 2015 is an official part of this syllabus.
Required reading	There is no required textbook. Weekly reading assignments

and resources	appear following the class schedule herein. Articles and other materials will be posted on BlackBoard.
Suggested reading and resources	Optional reading materials and learning resources will be posted to BlackBoard, particularly in relation to current newsworthy topics in public health.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Apply the public health core functions of assessment, policy development and assurance	• Demonstrate (e.g. through the portfolio) the application of assessment, assurance and/or policy development during the fieldwork experience.	• Addressed in: Classes - 1,2,3,4,5, & internship placement • Assessed in: Learning objectives, Logic model, Gantt chart, all 3 reflection papers
2. Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Demonstrate through self-reflection activities the application of one or more core PH values or techniques through the fieldwork experience	• Addressed in: 1,2,3,4,5 & internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, poster, all 3 reflection papers, poster presentation
3. Adhere to ethical and social justice principles and standards	• Apply ethnical principles to fieldwork placement, (e.g. human subjects' protection principles to the data collection). • Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards	• Addressed in: 4 and internship placement • Assessed by: Reflection paper 1
4. Interpret and analyze public health literature and apply evidence-based research	• Demonstrate (e.g. through the portfolio) the application of findings from public health literature to the field work experience	• Addressed in: 1,2,3,4,5,6,7 & internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, poster, all 3 reflection papers, poster presentation
5. Apply basic statistical and informatics techniques	• Participate, through the fieldwork experience, in using statistical and informatics techniques to support a public health program or policy in it's provision and effectiveness.	• Addressed in: Internship placement – when required in the internship setting and experience • Assessed by: poster presentation and poster
6. Communicate public health information through oral, written, digital and visual presentation	• Prepare written and oral progress and evaluation reports (e.g. the fieldwork project), using appropriate professional formats.	• Addressed in: 10, 11, 13, 14 & Class participation and internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, abstract, all 3 reflection papers, poster presentation and poster
7. Explain how social, behavioral, biomedical and environmental determinants affect population health	• Apply the elements of social, behavioral, biomedical and environmental determinants of and inequities in health and disease to aspects of the provision of public health activities in the internship settings and activities.	• Addressed in: 2,3,4,6,9 & internship placement • Assessed by: Logic Model, reflection paper 1, poster presentation and poster

8. Design and evaluate interventions to prevent or control public health problems	• Participate, through the fieldwork experience, in developing, carrying or evaluating out a public health program, remediation measure or policy.	• Addressed in: Internship placement – when required in the internship setting and experience • Assessed by: Learning objectives, Logic model, Gantt chart, abstract, all 3 reflection papers, poster presentation and poster
9. Collect, analyze and interpret public health data	• Participate, through the fieldwork experience, in collecting, analyzing and interpreting public health data to support a public health program or policy in it's provision and effectiveness.	• Addressed in: Internship placement – when required in the internship setting and experience • Assessed by: poster presentation and poster
10. Engage and collaborate with diverse groups	• Identify different stakeholders and evaluate their roles on the fieldwork project.	• Addressed in: 2,4,5,7,& internship placement • Assessed by: summary paper, poster presentation and poste
11. Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Apply the elements of public health core elements, infrastructure, and delivery to aspects of the provision of public health activities in the internship settings and activities.	• Addressed in: 2,3 & internship placement • Assessed by: reflection paper 1
12. Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project	• Addressed in: 1,2,3,4,10, & internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, summary paper
13. Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Discuss how the agencies you worked with during your fieldwork experience deliver health care to the populations they serve.	• Addressed in: 2,3,6,7,9,10 & internship placement • Assessed by: Learning objectives, Logic model, Gantt chart, poster, all 3 reflection papers, summary paper, poster presentation and poster

Course Assessments

The following summary of course assignments & assessments will be presented by the five major required elements of the course work:

1. Field work/Internship
2. Attendance/participation
3. Reflection Papers
4. Supporting and Summary documents
   (Contract elements, learning objectives, Gantt, Logic Model, Summary)
5. Poster/Oral presentation

Additional detailed instructions regarding the arrangements for the internship and the assignments can be found in the Internship Handbook available at the BlackBoard.

All assignments are to be submitted electronically through BlackBoard.

1. Field Work/Internship:
   The internship grade will based on the quality of the contract elements that are submitted, field supervisor comments, assessment of the quality of your service and difficulty of the placement (midpoint and final reviews). **Students should have secured an internship before the first class. Failure to do so may compromise the delivery of timely products and course standing.**

   A. Contract elements include:
   (see class schedule below for due dates)

   - Student information form (available electronically on Blackboard)
   - Supervisor information form (available electronically on Blackboard)
   - Signed student/supervisor agreement form (submitted as a pdf of the signed copy of the last page of the manual)
   - *Approved learning objectives**
   - *Approved logic model** (see: http://www.wkkf.org/knowledge-center/resources/2006/02/WK-Kellogg-Foundation-Logic-Model-Development-Guide.aspx) (Also, use the sample format available on Blackboard)
   - *Approved Gantt chart** (Use the sample format available on Blackboard)
   - *Human Subjects Basic Course* – Complete the Human Subjects Basic Course at the Collaborative Institutional Training Initiative (CITI) online site: https://www.citiprogram.org/ In creating your individual user login account when asked for the institution indicate CUNY, then follow the prompts to set up your account. After establishing your account you will be able to complete the online course for free. Submit the PDF certificate confirming completion.

- Proof of professional liability insurance (for students not working within another office/department of their current employer). Students should research the best option. Look for student packages for 1 semester covering liability between $1m/$3m. Two possibilities are described in the Manual (note: these are not endorsements).
- *Abstract**. First draft. See manual.
  *Note-Professor will review one draft. The next & final iteration will be graded.

Contract elements not due within first three weeks include:

- *Final Abstract** see guidelines in the Manual. This must be submitted by the last class.
- Approved Inter-agency affiliation agreement. This is to be completed and executed before the end of the course. An electronic copy must be given to Barbara Allier, copy to Professor Stackhouse using Blackboard. (Template available at: http://web.cuny.edu/academics/info-central/wwww/affiliation-agreements.html)

B. Midpoint review. Described in detail in the Manual.

- Student mid-point self evaluation, signed by supervisor. (Available on Blackboard).

C. Final Evaluation. Described in the Manual.

- Student Fieldwork Site Evaluation Form (Available on Blackboard). To be submitted electronically to Barbara Allier, copy to Professor Stackhouse using Blackboard.
- Completed timesheets – MPH students must document completion of 180 hours. (Blank forms Available on Blackboard) – Multiple pages with a cover summary page should be scanned to one PDF document with signatures and submitted electronically to Professor Stackhouse using Blackboard.
- Field supervisor final evaluation of student (The final evaluation form will be emailed to the site supervisor by Professor Stackhouse one week before the end of classes and returned to Professor Stackhouse). Note, failure of the supervisor to return the completed evaluation before grades are due may result in a delay of grade submission.

D. Guidelines for all materials to be submitted in fulfillment of course requirements noted above.

  - In addition to the detailed instructions for materials found in the Fieldwork Handbook the following standards apply:
  - The Reflection Papers & the Summary Document should have a title, your name, the date submitted, and include an

introduction, body and conclusion. These documents should be paginated.
- As noted in the Handbook, any time a reference is made the APA reference format is required.
- **All materials submitted** are required to have a document name using the following naming convention (This holds for all types of saved electronic documents – MSWord, Excel, PDF, or any other):
    - Last name.First initial. document name.MM.DD.YR (sample below)
    - Smith.M.ReflectionPaper1.09.15.15

2. Attendance:
   Attendance is mandatory and absences will result in reduced credit unless excused before the class by email; please arrive on time and make sure that all cell phones are silenced.

3. Reflection papers:
   Purpose of each reflection paper is to structure and organize student's learning experience against stated learning objectives, to facilitate synthesis of field activities, and to facilitate integration of theory and practice. Each reflection paper must be submitted to Professor Stackhouse using Blackboard by the end of the day (11pm) on the due date. Late papers will not be accepted unless cleared with Professor Stackhouse in advance. Paper are: #1 – Core Functions of Public Health, #2 – Evidence Based Public Health, and #3 – Leadership VS Management. Please see the manual for further instructions.

4. Summary document/evaluation:
   This summary should be at least a five page overview that critically describes your internship responsibilities, and major findings. The summary should be more than a description of what you did, it should contain insights about unexpected learnings and looking back, what you might have done differently. To be clear, admitting that an internship was not perfect is not a weakness. Indeed, identifying potential areas for improvement (either your own or the organization's) is at the core of what the internship is meant to deliver. **If you have produced a report, document or other final product(s) during your work at the internship, it (they) should be referenced and attached as an appendix. The final document should include itemized references to your learning objectives and clearly identify progress made and challenges faced.**

5. Posters:

Posters & their presentation represent a public display of your internship. Detailed instructions for the poster format appear in the Manual. Samples of posters from previous classes will be available at the BlackBoard along with a blank format for your use. Arrangements will be made with the Brooklyn College Library to print the posters at a discounted price. Note: this must be a professional poster. Posters not meeting professional expectations will not earn a passing grade.

Grading

Evaluation criteria

All assessment elements will be assigned a percentage grade & the final grade will be based on the combined grades based on their percentage weights.

The relative weight of each course component is as follows:

Assessment	Weight
Field Work	30%
Attendance/Participation	10%
Three Reflection Papers	30%
Supporting & Summary Documents	20%
Poster and Oral Presentation	10%
FINAL GRADE	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Graduate Bulletin and the Program Director for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

Attendance is a significant requirement of the class & attendance will be taken at each session. Students are expected to have read the assignments prior to the class and come prepared for discussion of the materials in relation to the in class presentations by Professor Stackhouse.

Late/incomplete submission of assignments

Late or incomplete submission of assignments will be accepted if there is a specific advance approval given by Professor Stackhouse. Assignments submitted late without advance approval within one week of the due date will be accepted & graded and the grade will be dropped by 10 percentage points. Note – BlackBoard gives documentation of the date and time that assignments are submitted.

Make-ups, rewrites, and extra credit

Make-ups and rewrites are not allowed. However, it should be noted that for the "Contract Elements" a first draft is submitted & returned with detailed feedback. The final copies of these items submitted three weeks after the first draft will be graded. The class does not offer extra credit opportunities

Expectations of students

Students are expected to be in class on time & to be prepared by having read the assigned materials. Mobile devices should be silent. No texting during class is allowed. If a topic arises in class discussion that may benefit from an online search, this will be

acceptable. In general laptops, tablets & smart phones should only be used to view saved electronic copies of class materials. Students will respect each other & fully participate in class discussions.

Expectations for the instructor

Students can expect respectful and professional interaction by Professor Stackhouse. He will post the PowerPoint presentations planned for class sessions one day prior to the class. All class assignments will be reviewed and comments/feedback will be offered within the BlackBoard system in a timely manner. Detailed “track changes” edits and comments will be given to written materials submitted. These are given not to suggest edits or rewrites but to offer feedback to students in relation to ways to improve future assignments. Professor Stackhouse will check Brooklyn College email approximately 4x a week & respond as soon as he is able.

Accessibility

In order to receive disability-related academic accommodations, students must first register with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell, at (718) 951-5538. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Academic integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Brooklyn College procedure for implementing the policy can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

Course Schedule *(Schedule is subject to change)*

Class Meetings HNSC 7920 – Fall 2015 (Thursdays 6:30-9:00pm)

1 – Aug 27 Introduction to Class; expectations, role, planning for the internship

2 – Sept 3 Public Health Core Functions

X – Sept 10 (No Class) College on Monday Schedule

3 - Sept 17 Public Health Infrastructure and Delivery
(First draft of all "Contract Elements" - *due 9/16*- letter A)

4 – Sept 24 Ethics and Methods (including community-based participatory research & human subjects' protection principles in data collection)

5 – Oct 1 Evidence Based Public Health Education (Reflection Paper #1 - *due 9/30*: Core functions)

6 – Oct 8 Public Health in Practice I: An in-depth review of Health Education to address Asthma (Final drafts of "Contract Elements" - *due 10/7- except final abstract*)

7 – Oct 15 Challenges and Opportunities: Internship at the Midpoint (Reflection Paper # 2 - *due 10/14*: Evidence Based Public Health)

8 – Oct 22 No Class to be held - Individual appointment will be scheduled in the classroom with the Instructor and mid-point check in with your supervisor. All midpoint reviews should have been electronically submitted.

9 – Oct 29 Public Health in Practice II: An in-depth consideration of two current topics in health education: Lay Health Workers & Online Health Literacy

10 – Nov 5 Leadership vs. Management: "Getting from the dance floor to the balcony"

11 – Nov 12 Making Presentations and Resumes and professional development (Bring 2 hardcopies of your resume.)

12 – Nov 19 Organizational change (Reflection Paper # 3 - *due 11/18*: Leadership vs Management)

X – Nov 26 (No Class) College Closed – Thanksgiving Holiday

13 – Dec 3 Individual scheduled presentations of Internships, Posters (session I)

14 – Dec 10 Individual scheduled presentations of Internships, Posters (session II)
(Summary papers, final documents and revised Abstract - *due 12/9*)

15 – Dec 16 - 23 Final Exams Period

- September 2 - Last day to add a class
- September 17 - Course withdrawal period begins / November 7 – withdrawal period ends

Reading Assignments

Sept 3 - Public Health Core Functions:

Ford, E.W., W.J. Duncan, and P.M. Ginter, *Health departments' implementation of public health's core functions: an assessment of health impacts.* Public Health, 2005. **119**(1): p. 11-21.

Levi, J., Juliano, C., Richardson, M. *Financing Public Health: Diminished funding for core needs and state by state variation in support.* Journal of Public Health Management & Practice, March/April 2007. **13**(2): p 97-102.

Rothstein, M.A., *Rethinking the Meaning of Public Health.* Journal of Law, Medicine & Ethics, 2002. **30**(2): p. 144-149.

Sept 17 - Public Health Infrastructure and Delivery:

Baker, E.L., Jr. et al, *The Public Health Infrastructure and Our Nation's Health. Annual Review of Public Health*, 2005. **26**:p. 303-318.

Mays, Glen P. et al, *Public Health Delivery Systems- Evidence, Uncertainty, and Emerging Research Needs*. American Journal of Preventive Medicine, 2009. **36**(3), p. 256-265.

Mays, Glen P, D. Scutchfield, M.W. Bhandari, and S.A. Smith, *Understanding the Organization of Public Health Delivery Systems: An Empirical Typology*. The Milbank Quarterly, March 2010. **88**(1): p. 81-111.

Sept 24 - Ethics and Methods:

Stone, D., *Policy Paradox:* The Art of Political Decision Making. 1997, NYC: W.W. Norton & Company. Chapter 2.

Callahan, D. and B. Jennings, *Ethics and Public Health: Forging a strong relationship.* American Journal of Public health, 2002. **92**(2): p. 169-176.

Bayer, R., *Ethics of Health Promotion and Disease Prevention*, in *Ethics and Public Health: Model Curriculum*, B. Jennings, et al., Editors. 2003, Association Schools of Public Health: Washington.
http://www.asph.org/UserFiles/Module6.pdf

Shore, N., Park, A., Castro, P., Wat, E., Sablan-Santos, L., Isaacs, M.L., Freeman, E., Cooks, J.M., Drew, E., Seifer, S.D. *Redefining Research Ethics Review: Case Studies of Five Community-Led Models*. Seattle, WA: Community-Campus Partnerships for Health, 2014.

Oct 1 - Evidence Based Public Health:

Brownson, R.C., J.E. Fielding, and C.M. Maylahn, *Evidence-Based Public Health: A Fundamental Concept for Public Health Practice.* Annual Review of Public Health, 2009. **30**(1): p. 175-201.

Rychetnik, L., et al., *Criteria for evaluating evidence on public health interventions.* Journal of Epidemiology and Community Health, 2002. **56**(2): p. 119-127.

Collins, C., Phields, M.E., Duncan, T. *An agency capacity model to facilitate implementation of evidence-based behavioral interventions by community based organizations.* Journal of Public Health management Practice, 2007. January Suppl. S16-S23.

Oct 8 - Public Health in Practice I: An in-depth review of Health Education to address Asthma:

Bailey, E.J., Cates, C.J., Kruske, S.G., Morris, P.S., Brown, N., and Chang, A.B. *Culture-specific programs for children and adults from minority groups who have asthma (Review*). The Cochrane Library, 2009, Issue 2.

Tapp, S., Lasserson, T.J., and Rowe, B.H. *Education interventions for adults who attend the emergency room for acute asthma (Review)*. The Cochrane Library, 2007, Issue 3.

Oct 29 - Public Health in Practice II: An in-depth consideration of two current topics in health education: Lay Health Workers & Online Health Literacy:

Lewin, S., Munabi-Babigumira, S., Glenton, C., Daniels, K., Bosch-Capblanch, X., van Wyk, B.E., Odgaard-Jensen, J, Aja, G.N., Zwarenstein, M., and Scheel, I.B. *Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases (Review*). The Cochrane Library, 2010, Issue 3.

Car, J., Lamh, B., Colledge, A., Ung, C. and Majeed, A. Interventions for enhancing consumers' online health literacy (Review). The Cochrane Library, 2011, Issue 6.

Nov 5 - Leadership vs. Management:

Mintzberg, H., *Governing management.* Harvard Business Review, 1996. **May-June**: p. 75-83.

Heifitz, R.A. and D.L. Laurie, *The work of leadership.* Harvard Business Review, 1997. **Jan-Feb**: p. 124-134.

Wright, K., et al., *Competency development in public health leadership.* American Journal of Public Health, 2000. **90**(8): p. 1202-1207.

Nov 12 - Resumes and professional development:
Resumes:
http://www.sph.unc.edu/student_affairs/revamp_your_resume_and_cv_3312_4585.html

Interviewing:
http://www.boston.com/jobs/bighelp2008/fall/common_interview_mistakes/?s_campaign=8315

Nov 19 - Organizational change:
Michie, S. and M.A. West, *Managing people and performance: An evidence based framework applied to health services organizations.* International Journal of Management Reviews, 2004. **5/6**(2): p. 91-111.

Fernandez, S. and H.G. Rainey, *Managing Successful Organizational Change in the Public Sector.* Public Administration Review, 2006. **March/April**: p. 168-176.

Boyne, G.A., *Sources of Public Service Improvement: A Critical Review and Research Agenda.* Journal of Public Administration Research & Theory, 2003. **13**(3): p. 367.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Brooklyn College
HNSC 7930X Research Seminar
3 Credits
Fall 2015

Time and location	4141 Ingersoll Hall, Thursday 6:30PM-9:00PM
Instructor	Professor Jerry Mirotznik, Ph.D., M.P.H. Email: Jerrym@brooklyn.cuny.edu (Best way to contact me). Phone: 718-951-5000, Ext. 2737 Office: 4110e Ingersoll Hall
Office hours	Tuesday, 2-3 p.m., Thursday 9-10 p.m., and by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Examination of the stages of the research process, highlighting selected research designs and data collection techniques. Application of the principles and methods of research to the critical analysis of the health and nutrition sciences literature.
Course prerequisites	Completion of two graduate courses in health and nutrition sciences, and a GPA of 3.00 (B) or better in graduate courses completed to date.
Course format	Lecture and discussion
Required reading and resources	Anol Bhattacherjee. *Social Science Research: Principles, Methods, and Practices* (2012). Textbooks Collection. Book 3. http://scholarcommons.usf.edu/oa_textbooks/3 Other required readings are accessible through the Blackboard course website

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply approaches for improving the health status of populations, including a specific initiative for a target population	• Explain the steps of the research process • Identify principles of ethics in research design • Explain the concepts of validity, reliability, construct operationalization • Differentiate sampling strategies • Explain and select appropriate research and experimental designs • Identify the principles and guidelines of survey design and measurement • Identify and analyze quantitative and qualitative data	• Exams • Term paper • Assignments • Class participation
Use audience-appropriate written and oral communication to convey public health information	• Communicate the results of research studies	• Exams • Term paper • Assignments • Class participation
Differentiate among evaluation methods in relation to their strengths, limitations and appropriate uses	• Identify the principles, concepts and method of evaluation	• Exams • Term paper • Assignments • Class participation

Course Assessments

The will be two tests, a midterm and a final exam. Very likely each will consist of short answer questions, i.e., multiple choice and true/false, definitions, fill-ins, and brief essays.

A number of questions will concern the critique of an excerpt from a research article, which will be handed out a week prior to the exam to give you an opportunity to read and review it.

The term paper, which should be between 12 and 15 double-spaced typed written pages, will involve using the Critical Outline handout to evaluate two published research articles addressing the same or related issues. The two articles should focus on a research topic that falls broadly within the parameters of Health Science. For instance, one might review articles aimed at explaining such health behaviors as smoking cessation, engaging in an exercise program or complying with a medication regimen. Alternatively, one might select articles that are focused on the health effects of racial, gender or class discrimination, or as a third example one might review some of the published research on stress and psychiatric illness. For the September 24th class, please provide me with copies of the two articles you would like to use for your term paper. I'll review your articles to make sure they are appropriate for the assignment and will provide you with good material for your term paper. The term paper will be due the day of the final examination. As such, there will be no opportunity to revise and resubmit it.

Students are required to complete the Collaborative Institutional Training Initiative program found at www.citiprogram.org. The CITI program is used by thousands of institutions and organizations worldwide for training and certification in the ethical standards required for the responsible conduct of research and for studies involving human subjects. All CUNY faculty members, postdoctoral scholars, graduate and undergraduate students involved in research are required to complete the CITI. This training is an essential part of any introduction to research class. Register as a new user. Scroll down the list of participating institutions and select "City University of New York." You are to complete the basic CITI course. Your learner group is "Graduate Student." Please note that there are multiple modules to the basic course which can take several hours to complete, so don't wait until the last minute to do this. Print your completion certificate and bring it to class on the due date indicated below.

There will be 4 additional assignments. These assignments will be based on readings and the class lectures and will provide you with an opportunity to apply the course material and to thereby enhance your understanding of that material. It will also enable me to obtain relatively quick feedback about what parts of the material may need additional discussion and review. The due date for each assignment is listed on the syllabus.

Typically final grades for this course have not been based on a curve. However, I am open to curving the grades if it is warranted.

Grading Criteria

Class participation grading rubric

Score	Active Listening	Preparation	Quality of contributions to class	Attendance
A	Actively and respectfully listens to peers and instructor; consistently engaged and focused	Clearly demonstrates that s/he has read/thought about the material	Comments and asks pertinent questions frequently. Expresses thoughts clearly	Arrives to class on time, does not have unexcused absences, and absent ≤ 2 times
B	Sometimes displays lack of interest; not entirely engaged throughout the session; occasionally checks non-course material during class time.	Sometimes arrives unprepared or with only superficial preparation.	Comments and questions sometimes advance the discussion, but sometimes do little to move it forward	Usually arrives to class on time; absent ≤ 2 times, but only sometimes informs instructors about unavoidable absences
C,D,F	Projects lack of interest during class; apparent visible clues that s/he is not listening to peers or instructor; frequently checks non-course material during class time.	Exhibits little evidence of having read or thought about assigned material	Thoughts are not expressed clearly; comments are often off topic; or student does not participate in class discussions	Arrives consistently late, and/or does not inform instructor about absences, or absent > 2 times.

* adapted from: http://www46.homepage.villanova.edu/john.immerwahr/TP101/EvDay/discussion%20rubric.pdf. Accessed on July 21, 2010

Term paper and assignments grading rubric

Score	Criteria and Standard
A	An "A paper" will clearly, articulately, substantively, and fully address the central topics indicated in the instructions for the assignment. The paper's organization will be easy to follow. The author will demonstrate critical thinking through application, analysis, synthesis, and/or evaluation of information. There will be at most one or two composition mistakes. The author will use pertinent and specific examples to illustrate points.
B	A "B paper" will address the central topics but not as clearly, articulately, substantively, and/or as fully as an A paper. The paper's organization will be easy to follow. The author will demonstrate critical thinking through application, analysis, synthesis, and/or evaluation of information. There will be more than two but no more than five composition mistakes. The author will use pertinent and specific examples to illustrate points.
C	A "C paper" will address the central topics but less clearly, articulately, substantively, and/or as fully as a B paper. The paper's organization will be less easy to follow than a B paper. The author may demonstrate critical thinking but not consistently or persuasively. There will be six to ten composition mistakes. Pertinent and specific examples will be inconsistently used.
D	A "D paper" may identify the central topics but will not address them clearly, articulately, and/or fully. The paper will lack organization. There will be more than ten composition mistakes. The author will not demonstrate critical thinking. The content of the paper and examples used may or may not have anything substantively to do with the topic
F	Hopefully it never comes to this

The relative weight of each course component is as follows:

Assessment	Weight
Midterm Exam	25%
Final Exam	25%
Term Paper	25%
CITI Certificate	5%
Assignments	10%
Class Participation	10%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. (Please see list of important dates below.) Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Graduate Bulletin and the Program Director for further details.

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When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Regular attendance and active class participation are required to succeed in this course. Missing all or part of a class period will negatively impact on your understanding of the subject matter. Class will begin promptly to maximize our time together. Please arrive to

class on time. Arriving late might well disrupt the learning environment and your fellow students' understanding of the material. If you cannot attend a class or know in advance that you won't be able to get there on time, please let me know as early as possible by email.

Please note the state law regarding non-attendance because of religious beliefs (see p. 46 of the Graduate Studies Bulletin)

One impediment to class participation is the use of laptops and other electronic devices during class discussions and lecture. Not only do such devices disrupt the learning of your peers, but there is empirical research indicating that their use hinders your own learning and intellectual performance in the classroom. Therefore, use of such devices is banned during this course, unless prior permission is granted from the professor. For a further discussion of the reasons behind this decision, please see:

https://www.washingtonpost.com/posteverything/wp/2014/12/30/this-year-im-resolving-to-ban-laptops-from-my-classroom/

To limit disrupting the classroom environment please put all cell phones on vibrate and turn off audible ringers.

Please feel free to use email to ask questions about lectures, readings and assignments. When sending an email be sure to include "HNSC 7930 - [Your name]" in the subject line. Alternatively, substantive questions might be best addressed during office hours. I would strongly encourage you to make use of them.

A makeup test for the midterm examination will not be available, unless advanced notification of the absence is given or the absence was for a very good reason that can be supported with appropriate documentation, e.g., physician's note. Students who miss the final exam will need to petition the Graduate School to request a makeup. To maintain fairness among all students, rewrites or extra-credit assignments will not be allowed. Late submissions of assignments will result in a grade reduction for each week overdue.

Accessibility

In order to receive disability-related academic accommodations, students must first register with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell, at (718) 951-5538. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Academic integrity
The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Brooklyn College procedure for implementing the policy can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

Course Schedule

Please note that the schedule is subject to change throughout the semester.

Several important dates are listed below. Students should refer to the current academic calendar for the full list of dates.

Wednesday, September 2 Last day to add a course
Thursday, September 10 Conversion Day: Classes follow a Monday Schedule
Wednesday, September 16 Last day to drop a course without a grade
Friday, September 25 Conversion Day: Classes follow a Tuesday Schedule
Monday, November 9 Last day to withdraw from a course with a W (non-penalty) grade

Schedule

Week	Date	Topic	Readings and Assignment
1	August 27	Introduction to Research- The Nature of Scientific Inquiry	Textbook Chapter 1 R.W. Morrell, D.C. Park, D. P. Kidder, and M. Martin. (1997). Adherence to Antihypertensive Medications Across the Life Span. *The Gerontologist*, 37 (5): 609-619.
2	September 3	The Philosophy of Science and Causal Inference	Textbook Chapter 3, pp. 17-19 K.J. Rothman and S Greenland. (2005). Causation and Causal Inference in Epidemiology. *American Journal of Public Health,* 95 (S1): S144 –S150. Assignment #1 due
3	September 10	No Class (Monday Schedule)	
4	September 17	Research Ethics	Textbook Chapter 16 A.M. Brandt (1978). Racism and Research: The Case of the Tuskegee Syphilis Study. *The Hastings Center Report,* 8 (6): 21-29 CITI Completion Certificate due
5	September 24	Overview of the Research Process	Textbook Chapter 3, pp. 20-24 Two articles for Term Paper due Assignment #2 due

6	October 1	The Stage of the Conceptual Model: Formulating a Research Question	Textbook Chapters 2 and 4 J.A. Earp and S.T. Ennett (1991). Conceptual models for health education research and Practice. *Health Education Research*, 6 (2): 163-171. Y. Ben-Shlomo and D. Kuh. (2002). A life course approach to chronic disease epidemiology: conceptual models, empirical challenges and interdisciplinary perspectives. *International Journal of Epidemiology,* 31 (2):285-293.
7	October 8	The Stage of Empirical Methods: Nature of the Research Case	Textbook Chapter 5 G. Rose (1985). Sick Individuals and Sick Populations. *International Journal of Epidemiology*. 14 (1): 32-38. Assignment #3 due
8	October 15	Nature of the Research Case (continued): Sampling Strategies	Textbook Chapter 8
9	October 22	Midterm Exam	
10	October 29	Nature of the Research Properties: Conceptualization and Measurement of Variables	Textbook Chapter 6 J. M. Oakes & P.H. Rossi (2003). The measurement of SES in health research: current practice and steps toward a new approach. *Social Science & Medicine,* 56 (4): 769–784.
11	November 5	Nature of the Research Properties (continued): Quantitative and Qualitative Data; Levels of Measurement; Validity and Reliability	Textbook Chapters 7 and 12 K. Wright, S. Naar-King, P. Lam, T. Templin, and M. Frey (2007). Stigma Scale Revised: Reliability and Validity of a Brief Measure of Stigma For HIV + Youth. *Journal of Adolescent Health*, 40 (1): 96–98

12	November 12	Methods for Data Collection: Elements of Study Design - Cross-sectional vs Longitudinal; Available vs New Data; Reactive vs Non-reactive Methods, Experimental vs Observational Designs	Textbook Chapters 9 and 10 M. Sibicky and J F. Dovidio (1986). Stigma of Psychological Therapy: Stereotypes, Interpersonal Reactions, and the Self-Fulfilling Prophecy. *Journal of Counseling Psychology*, 33 (2): 148-154 M.M. Velasquez, K. Von Sternberg, D.H. Johnson, J.P. Carbonari, C. Green and J.T. Parsons (2009). Reducing Sexual Risk Behaviors and Alcohol Use Among HIV Positive Men Who Have Sex With Men: A Randomized Clinical Trial. *Journal of Consulting and Clinical Psychology,* 77 (4): 657–667. Assignment #4 due
13	November 19	Methods for Data Collection (continued): Elements of Study Design	D.S. Lauderdale (2006). Birth Outcomes for Arabic-Named Women in California before and after September 11. *Demography*, 43 (1): 185-201. J.W. Song, and K.C. Chung, (2010). Observational Studies: Cohort and Case-Control Studies. *Plastic Reconstructive Surgery*, 126 (6): 2234–2242. R. Doll and A. B. Hill (1956). Lung Cancer and Other Causes of death in Relation to Smoking. *British Medical Journal*, 5001 (2): 1071-1081.
14	November 26	Thanksgiving Holiday: College Closed	
15	December 3	Stage of Data Analysis and Interpretation: The Role of Descriptive and Inferential statistics	Textbook Chapter 14
16	December 10	Stage of Data Analysis and Interpretation (continued): Assessment of the Study Findings	Textbook Chapter 15
17	December 17	Final Examination	

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Brooklyn College
HNSC 7940X Research Seminar III
3 Credits
Fall 2015

Time and location	Room 4141 Ingersoll, Wednesday, 6:30-9:00 PM
Instructor	Ruth McChesney, PhD, MPH ruthmc@brooklyn.cuny.edu (718) 951-5000 Ext 2757
Office hours	Mondays, Wednesdays 4:30-5pm, Room 4200 Ingersoll
Course website	N/A
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Examination of quantitative and qualitative techniques appropriate for research in the health sciences. Class discussion of each student's effort in developing a master's paper.
Course prerequisites	Health and Nutrition Sciences 7930X and a GPA of 3.00 (B) or better in graduate courses completed to date.
Course format	Seminar
Required reading and resources	None required
Suggested reading and resources	Optional materials will be made available as part of the course

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*

Apply the public health core functions of assessment, policy development and assurance	• Construct a testable research question or practice problem, which
	  ○ can feasibly be addressed within a specified time period
	  ○ is of public health relevance
	  ○ when addressed will fill a knowledge gap
		Sept 16 assignment (essay on topic); Oct 7 assignment (first draft of introduction); Nov 18 assignment (first draft of issues and gaps); Dec 2 assignment (draft of research plan & draft of concluding comments); Dec 16 assignment (draft of full paper)

Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Place a research question or practice problem within a relevant conceptual framework and the broader public health context • Identify and apply relevant professional or scholarly methods to an investigation or practice problem, including use of a predefined protocol or research plan. • Plan the analysis, synthesis and write up of an investigation from inception to completion including scheduling of items on the critical path to completion	Oct 7 assignment (first draft of introduction); Dec 2 assignment (draft of research plan); Dec 2 assignment (draft of research plan & draft of concluding comments); Dec 16 assignment (draft of full paper)
Adhere to ethical and social justice principles and standards	• Analyze relevant ethical or social justices issues using widely recognized principles or standards. • Obtain IRB or IACCU approval or exemption if appropriate. • Conduct any public health investigations involving	Sept 16 assignment (essay on topic); Oct 7 assignment (first draft of introduction); Nov 18 assignment (first draft

	human subjects in accordance with OHRPP ethical performance standards, including maintenance of confidentiality and security.	of issues and gaps); Dec 2 assignment (draft of concluding comments); Dec 16 assignment (draft of full paper)
Interpret and analyze public health literature and apply evidence-based research	• Implement a structured search of the literature. • Summarize the literature to date, including quantitative associations and qualitative themes, on a specific topic taking into account levels of evidence • Identify weaknesses within existing literature, such as addressing the wrong question, lack of comparison groups, biases or limited generalizability	Sept 30 library session; Oct 14 assignment (first draft lit search); Oct 21 assignment (revised draft lit search); Oct 28 assignment (first draft of lit review); Nov 4 assignment (revised draft of lit review); Nov 18 assignment (first draft of issues and gaps); Dec 16 assignment (draft of full paper)

Course Assessments

Assessment will be based on class participation, the assignments, drafts of the paper, including the final paper.

Grading

Evaluation criteria

Students receive a letter grade for the course.

Assignments will be evaluated based on the following: (1) the assignment was submitted on time, 2) the prescribed format for the assignment was followed, 3) correct English composition was used, 4) identify feedback received and pinpoint how the feedback has been responded to, and 5) the demonstration of clarity of expression and engagement in critical thinking. Your understanding of the course material will also be evaluated through your completed first draft of the master's paper.

The relative weight of each course component is as follows:

Assessment	Weight
Drafts of sections of paper	30%
Final completed draft of paper	40%
Assignments	15%
Class Participation	15%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

As stated in the Brooklyn College Graduate Bulletin, students in the MPH program must receive a grade of B or better in HNSC 7940 and may take the course a maximum of two times; Note that there is no grade of D in any of the graduate programs at Brooklyn

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty

generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Students are encouraged to complete all work on time; if you don't finish this course before the start of the next semester, you will not be able to take the second half of the master's paper course in the following semester.

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Graduate Bulletin and the Program Director for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

The first 5 meetings for the course are class meetings. After October 7, individual meetings will be arranged, with class meetings only as appropriate.

Late/incomplete submission of assignments

Unless noted otherwise, written assignments must be successfully sent by email by the date and time indicated.

Make-ups, rewrites, and extra credit

No make-ups, rewrites, or extra credit assignments are allowed.

Expectations of students

Please see Appendices A and B

Expectations for the instructor

Please see Appendices A and B

Accessibility
In order to receive disability-related academic accommodations, students must first register with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell, at (718) 951-5538. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Academic integrity
The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Brooklyn College procedure for implementing the policy can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

Course Schedule

Note: The schedule is subject to change throughout the semester. The first 5 meetings for the course are class meetings. After October 7, individual meetings will be arranged, with class meetings only as appropriate.

September 2 Introduction to the course, review of the syllabus, discussion of expectations, overview of the structure, scope, and sections of the Master's paper, review of educational objectives indicating critical thinking, and engagement in material.

September 9 Writing as a process. Discussion of sections of the Master's paper.

September 16 Assignment due: 200-250 word essay on what you plan to study in your Master's paper, why it interests you, and how this topic holds importance for your field (Community Health or MPH). See the prescribed format for what you are to do in organizing the assignment. Also submit a copy by 4:00 PM September 16 in an email attachment.

September 23 No Class

September 30 Library resources. Meet at 6:30 PM in the Brooklyn College Library's Workshop Center, Room 148, on the 1st floor. Lee Ann Fullington, Health &

Environmental Sciences Librarian, (LAFullington@brooklyn.cuny.edu) will conduct this session. Come prepared to learn about library resources available to you.

October 7 Assignment due: the first draft of the Introduction section to your Master's paper (4-5 pages). Also submit a copy by 4:00 PM October 7 in an email attachment.

October 14 Assignment due: Submit by 4:00 PM on October 14 in an email attachment an electronic copy of your first search of the literature. Identify in an introductory paragraph or two the focus of your search as based on a summary of what you wrote for the previous class, including feedback received and your response to the feedback. Identify search strategies you used. Identify at least 15 sources of published material relevant to your focus. Provide for each source identified an annotation of the topic and how it suits your proposed paper. In the assignment, cite each source using correct APA format, and include a References section in which the sources are presented correctly in APA style. NOTE: in this assignment you primarily are providing an annotated list of sources that are relevant.

October 21 Assignment due: Submit by 4:00 PM on October 21 in an email attachment an electronic copy of a revised, expanded literature search. Follow the directions given for the assignment due October 14, and include at least 25 annotated sources this time.

October 28 Assignment due: Your first draft synthesizing the literature for your Master's paper. See the format to be followed. Also send by 4:00 PM a copy in an email attachment.

November 4 Assignment due: Your latest version of the literature review for your Master's paper. In a beginning statement given prior to the start of your literature review, identify the feedback you have received and how your latest version is a response to the feedback. Include the finished Introduction for your paper (4-5 pages). For the literature review, provide 10-15 double-spaced, typed pages analyzing and synthesizing the literature most relevant to your purposes. Follow the prescribed format. Also send by 4:00 PM a copy in an email attachment.

November 11 Work on writing the section of your paper identifying issues or gaps revealed in your literature review that need to be researched empirically.

November 18 Assignment due: The section on issues and gaps needing research attention (4-5 double-spaced, typed pages). Identify clearly what are the issues or gaps. Tell why they matter to your field. Link your statements to published literature that you cite. Include a list of References. Also send by 4:00 PM a copy in an email attachment.

November 25 Work on a plan of action to complete an empirical research study focused on the issues or gaps you have identified.

December 2 Assignment due: A draft of your research plan (2-3 pages double-spaced and typed) and a draft of your Concluding Comments (1-2 pages). Also send by 4:00 PM a copy in an email attachment.

December 9 Work on finishing the Master's paper in terms of these sections: Title page, Abstract, Introduction, Literature Review, Issues and Gaps Uncovered, Concluding Comments, and References. Include the research plan in an appendix.

December 16 Assignment due: In an email attachment, submit an electronic copy of the final version of your Master's paper with all sections noted above, including your revised draft of your research plan in an appendix.

Important dates for Fall 2015

The full Fall 2015 academic calendar can be found at:
http://www.brooklyn.cuny.edu/web/about/administration/enrollment/registrar/bulletins/spring15/calendar.php

Aug 27	First day of classes
Sept 5, 6	No classes scheduled
Sept 7	College Closed- Labor Day
Sept 10	Conversion day, classes follow Mon schedule
Sept 13-15, 22, 23	No classes scheduled
Sept 25	Conversion day, classes follow Tues schedule
Oct 12	College Closed - Columbus Day
Nov 9	Last day to withdraw from a class with a grade of "W
Nov 26, 27	College Closed - Thanksgiving holiday
Nov 28, 29	No classes scheduled - Thanksgiving recess
Dec 12	No classes scheduled
Dec 15	Reading Day
Dec 16-23	Final Examinations
Dec 24-25, 31	College Closed – Holidays observed

Appendix A: Discussion Format for Peer and Group Review of Assignments

Specifically, answer these questions about the assignment of each group member:

1. What are strengths of the student's assignment?
2. Did the student follow the format for the assignment?
3. How clear and detailed is the student's response to feedback?
4. What were areas of agreement with the analysis done by the student?
5. What were areas of disagreement about the analysis and how were these disagreements resolved?
6. What can be done to strengthen the student's assignment as a reliable and critical presentation of the material?

Reliable means dependable, trustworthy, consistent with the material; critical indicating serious analysis and evaluation of the material in light of other information, for instance, from other scholarly sources. See instructions in the syllabus for what the assignment should contain. You should take into account English composition issues, logic, trustworthy presentation of competing points of view, and persuasive use of sources to provide evidence to support assertions.

At the end of the discussion period, turn in the summary of discussion of the questions to the student. Use this sheet as your guide about the questions to address. Remember to give examples to illustrate your points when you answer the questions. Give examples to support your claim.

Take turns in each group meeting summarizing answers for the questions. Don't have the same person summarize the discussion for the entire meeting. Every group member must take part in recording the meeting.

Appendix B: Writing for this Class

Developing your writing in this course

- This is a graduate-level course. You are expected to submit graduate-level writing. This expectation means written work that follows the directions of the assignment, articulates original ideas and insights, and is free of excessive spelling, grammatical, and writing errors. Please see the sections, "Writing issues" and "Composition Mistakes" for more details.

- Apart from learning content, another goal of the course is to develop or strengthen skills that will help you be a better student and, ultimately, a better professional. These skills include: articulating your ideas in writing, collaborating with peers, engaging in a productive critique of your own writing, and offering constructive, critical feedback to peers.

Writing Issues

- Spelling, punctuation, grammar, and writing ALWAYS count. You must write in full, properly punctuated, sentences. Sentences must be actual sentences, rather than sentence fragments or run-on sentences. Paragraphs must contain thesis statements.

- Points will be automatically deducted from your grade if there are *excessive* and *serious* spelling, grammar, and/or writing issues.

- What counts as "excessive and serious"? This decision varies by assignment, but a general rule of thumb some persons follow is that the number of mistakes should not exceed the number of pages of that assignment. For example, if you are submitting a 5 page paper, any more than 5 errors will lead to a reduction in points earned. We will follow that general rule. However, as a hard fast rule, regardless of the length of the assignment, ten or more errors will mean all points are deducted for composition mistakes. Such carelessness will spill over into negative evaluations about the credibility of the assignment itself.

Use of correct English in papers

- Written English should be used correctly. Clarity of expression is marred by presentation mistakes. Papers with presentation mistakes – such as typos, poor organization, and run-on sentences -- lose credibility with readers. Obviously, content is crucial; poor presentation of good content makes for a bad report, however. Turn in credible reports. Be a credible writer.

- *Composition Mistakes.* Common composition mistakes can include run-on and incomplete sentences, incorrect spelling, and incorrect use of words.

- *Challenge yourself to be clear and specific.* Feedback**:** In papers written after the first assignment, you need to indicate in a beginning paragraph or two what feedback you have received and what you have done to incorporate feedback about improving your writing. There should be a clear sense of the specifics in the feedback and the specifics in your responses.

- For additional assistance with writing issues, contact the Brooklyn College Learning Center, which offers one-on-one tutoring, at 718-951-5821 or http://lc.brooklyn.cuny.edu

The citation style and formatting of papers in this course

- You must properly cite each data source, both in text and in a reference section at the end of the paper, per American Psychological Association (APA) style (6th edition, 2010). For students who use RefWorks, Endnote, or any other bibliographical/citation program, please note that it is your responsibility to double-check the output these programs produce, as you are ultimately liable for all of the work you submit.

- Unless otherwise specified, your papers should be typed, double spaced, with 1 inch margins and 12 point font. All pages must be numbered.

- Points will be automatically deducted from your grade if your assignment is not formatted as instructed. Here are a few examples:

- If your assignment has 1.5 spacing rather than double spacing

- If your margins are 1.25” and not 1”

- If your assignment is doesn’t have a bibliography or “works cited” section (and you were asked to create one)

- If your citations are not presented in APA format

Submission policy

- Unless noted otherwise, written assignments must be successfully sent by email by the date and time indicated.

Plagiarism

- All work must be properly cited. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. We may review strategies for avoiding plagiarism in this class; however it is ultimately your responsibility to know what is and is not plagiarism. Plagiarism is the act of presenting another person’s ideas, research, or writing as one’s own. Internet plagiarism includes

submitting downloaded papers or part of term papers, paraphrasing or copying information from the Internet without citing the source, and cutting and pasting from various sources without proper attribution. You are expected when you quote someone else to place the words in quotation marks, identify explicitly the source, and give the page number(s) for the quote. When you use someone else's ideas but paraphrase them, you are expected to identify explicitly the source of your information. If you plagiarize in this course, the consequences range from failure for the assignment to failure for the course. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: http://www.brooklyn.cuny.edu/bc/policies

Last Updated August 19, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
HPM 75100: Public Health and Health Care Law
3 Credits
Fall 2015

Time and location	Thursdays, 6:05-7:50pm, Silberman (2180 3rd Ave,), Room SB 219
Instructor	Wilfredo Lopez, JD Adjunct Professor, CUNY School of Public Health, General Counsel Emeritus, New York City Department of Health and Board of Health Phone: 516-477-4520 (cell) wl455@hunter.cuny.edu (preferred contact)
Office hours	Thursdays, 5:00-6:00pm
Course website	Students log into the course website through their Blackboard portal: https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Reviews key areas of the legal process relevant to health care delivery and public health; analyzes major court decisions that have affected the field and selected federal, state and local statutes that affect public health and health care practice; acquaints students with the basics of legal research and legal reasoning as applied to public health and health care.
Course prerequisites	PH 75500, PH 75600 or with instructor's permission for those with at least one year of health care experience
Course format	This course is taught with a mix of online learning resources, discussion, collaborative exercises, self-assessment, and case studies. All materials are available on the course website. This is not a self-paced course; there are weekly deadlines for discussion and activities.

Required reading and resources	Text: Goodman, Hoffman, Lopez, Matthews, Rothstein & Foster: Law in Public Health Practice (Oxford University Press, Second Edition 2007). Comes in hardcover and is available electronically through the CUNY Libraries at: https://libsearch.cuny.edu/F/?func=item-global&doc_library=CUN01&doc_number=008323621&year=&volume=&sub_library=HC001
Suggested reading and resources	http://www.nyc.gov/html/doh/html/about/health-code.shtml http://www.nyc.gov/html/doh/html/about/notice.shtml http://www.nyc.gov/html/doh/html/about/public-meetings-archive.shtml

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply relevant theoretical/conceptual models and leadership principles to developing health policy and administrating health programs	• Articulate how law can assist public health professionals achieve public health goals • Access legal cases, statutes and regulations • Explain the importance of laws and policies that are practical, implementable and enforceable • Articulate basic constitutional, tort and regulatory principles	· Class Discussions · Case Critique · Religious Exemption Assignment · Paper
Identify and analyze the legal, economic, ethical and health bases and implications of public health policies that affect urban populations	· Describe the role of the legal system in public health, health policy and health care delivery · Recognize the difference between federal, state and local jurisdiction	· Class Discussions · Case Critique · BOH Meeting Summary · Paper
Apply strategies for advocating for effective public health policies and programs	• Identify and analyze legal issues and how they impact public health programs • Recognize the different roles of public health practitioners and public health attorneys	· Class Discussions · Case Critique · BOH Meeting Summary · Religious Exemption Assignment · Paper

Analyze and critically evaluate theoretical and conceptual models used to describe the U.S. health care system and the delivery of health care	· Recognize and describe the role of litigation on the U.S. health care system and on quality of care · Describe how health care facilities and professionals are licensed and regulated	• Class Discussions

Course Assessments

Class Discussions: Each week we will discuss the assigned reading material. Students will be expected to contribute to the discussions and express their views.

Board of Health (BOH) Meeting Summary: Students will view a videotaped NYC BOH meeting, summarize it, select a particular issue presented at the meeting and explain by posting a discussion of why they believe the position taken by the Department of Health and Mental Hygiene reflects a sound or unsound public policy.

Case Critique: Students will read the NY Court of Appeals decision in the NYC soda-portion cap case and a related law journal article, and write a short paper discussing the legal and policy issues raised and why they think the case was correctly or wrongly decided.

Religious Exemption Assignment: Students will write a short paper discussing the constitutional and policy aspects of religious exemptions to mandatory school vaccinations.

Paper: As a final exam students will write a paper setting forth a public health problem that they believe can and should be addressed by a federal, state or local statute or regulation, articulate the essential elements of such a law, and explain the scientific and policy rationale therefor.

Grading

<u>Evaluation criteria</u>

Assignments will be assessed based on a rubric found on the course website. Additional specific information about grading criteria will be distributed with the assignment. [Need to discuss further]

The relative weight of each course component is as follows:

Assessment	Weight
Class Discussions	20%
BOH Meeting Summary	15%
Case Critique	20%
Religious Exemption	20%
Final Paper	25%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Syllabus Change Policy

This syllabus is a guide for the course and is subject to change with advance notice. Changes to the syllabus will be announced in class and posted to Blackboard as an announcement.

Attendance and class participation

It is required that students come to all class sessions-- A sign in sheet will be distributed at each class. More than one absence will result in a penalty of 5 points from the final grade, with few exceptions and only if a reasonable excuse is documented.

Please call or email if there is a problem with attending or being late to a particular session, prior to the class.
It is expected that students will do the assigned readings prior to coming to class.
It is expected that students will participate in classes and ask questions on the material being presented in the course, and on any assignments that may seem unclear, prior to the work being submitted.

Late/incomplete submission of assignments

It is expected that students will hand in assignments on time, and if any brief extension is needed, permission will be sought in advance. Assignments more than a week late (even with permission) will not be accepted. Incomplete submission of assignments will not be accepted.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites or extra credit assignments allowed.

Expectations of students

Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
Know how to use library resources and citation tools.
Show respect to everyone in the course.
Be fully prepared to actively participate in discussion.
Complete all assignments by their assigned due date. No credit for work completed after the due date.
No credit for assignments suspected of plagiarism or cheating.
Be held accountable for all material assigned/covered in the course.
Regularly check the course website and official university email for course correspondence.
Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
Contact the professor directly with personal questions and concerns related to the course.
When in doubt, ask questions and clarify course assignments and expectations.
Cellphones are not allowed to be used in class. Computers, if any, are to be used only for taking notes.

Expectations for the instructor

Provide regular announcements, reminders, and suggestions on the course website.*
Monitor, ask follow-up questions, and answer questions presented during discussion.
Respond to student email within 48 hours Monday through Friday.
Grading and feedback on assignments within 1 week of the due date.

Communication about grades and progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule
This schedule may change as the semester progresses.
Refer to the current academic calendar for important dates.

Session 1: 8/27; Assessment: Discussion
Topic: Course Overview; Legal Underpinnings of Public Health/Federalism/Preemption

Readings/Resources:
Understanding litigation and how to read cases: "How to Brief a Case"
(http://www.lib.jjay.cuny.edu/research/brief.html)

Text pp. 25-44, 51-53, and 72-75.

US Constitution: 10th Amendment; Article VI, paragraph 2; Article I, Section 8, clauses 1 and 3. Access to the text of the U.S. Constitution:
(https://www.law.cornell.edu/constitution)

Session 2: 9/3; Assessment: Discussion
Topic: Public Health and the Judiciary; Accessing cases, laws and regulations online.

Readings/Resources:
Text pp. 89-109

Session 3: 9/17; Assessment: Discussion, BOH Meeting Summary Due
Topic: State Police Power/NYS and NYC Public Health Legal Structure

Readings/Resources:
Try to access and only skim the following laws and regulations. Specific provisions will be discussed in relation to jurisdiction and authority.

NYS Public Health Law Sections 200, 201, 206, 220, 225(5), 228, 230, 312, 1309, 2110 and 4104. (http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, then PBH.

NYS Sanitary Code [Title 10 of the New York Code of Rules and Regulations (NYCRR), Volume A] - only skim the table of contents for Parts 1 through 24.
(http://w3.health.state.ny.us/dbspace/NYCRR10.nsf/Full+Directory?OpenView)

NYC Charter Chapter 22, Sections 551, 553, 555, 556(c) & (d), 557, 558.

(http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, scroll down and click on NYC.

NYC Administrative Code, Title 17 - table of contents only. (http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, scroll down and click on ADC

NYC Health Code [Title 24 of the Rules of the City of New York (RCNY)] - table of contents only. (http://www.nyc.gov/html/doh/html/about/health-code.shtml)

Session 4: 9/24; Assessment: Discussion
Topic: Legal Counsel to Public Health Practitioners

Readings/Resources:
Text pp. 199-221

The NYC "Soda-Portion Cap" case, 23 N.Y.3d 681, 16 N.E.3rd 538, 922 N.Y.S.2d 480 (2014)

Harvard Law Review article re. "Soda-portion Cap" case. (http://harvardlawreview.org/2015/03/new-york-statewide-coalition-of-hispanic-chambers-of-commerce-v-new-york-city-department-of-health-and-mental-hygiene/)

Session 5: 10/1; Assessment: Discussion,
Topic: Surveillance and Epidemiologic Investigations

Readings/Resources:
Text pp. 229-235

NYC Health Code (Title 24 of the R.C.N.Y.) Sections 11.01, 11.03 (just skim the listed conditions, but read the text of subdivisions (a) through (e)), and 11.05, 11.10, 11.11, 11.13, 11.15, 11.17, 11.23, 13.01, 13.03(a) and (c). (http://www.nyc.gov/html/doh/html/about/health-code.shtml)

Session 6: 10/8; Assessment: Discussion, Case Critique Due
Topic: Environmental Health

Readings/Resources:
Text pp. 478-505

NYC Health Code [24 R.C.N.Y.] - Review Article Headings of Title IV (Environmental Sanitation), Articles 71 through 181. Read Sections 81.08 (trans fats) and 81.50 (calorie labeling). (http://www.nyc.gov/html/doh/html/about/health-code.shtml)

Session 7: 10/15; Assessment: Discussion
Topic: Basics of Health Care Law -- Why is Everyone Worried about Liability? (Guest Lecturer - Rose Gasner)

Readings/Resources:

General liability—Hall v. Hilbun, 466 So.2d 856 (Miss. 1985) Note: Read pp. 860-873, and 877-880. Helling v. Carey, 519 P.2d 981 (Wash. 1974).

Institutional liability—Annas GJ, The Patient's Right to Safety—Improving the Quality of Care Through Litigation Against Hospitals, New England Journal of Medicine,2006; 354: 2063-2066.

Contract law: Manny V. Central States, Southeast and Southwest Pension and Health and Welfare Funds, 2004 U.S. App. LEXIS (7th Cir. 2004). Lowell v . Drummond, Woodsum & MacMahon, 2004 U.S. Dist. LEXIS 13059 (D. Me. 2004).

Session 8: 10/22; Assessment: Discussion
Topic: Basics of Health Care Law Continued

Readings/Resources:

Regulating Hospitals and Clinics -- NYS Public Health Law Sections 2801, 2805, review the table of contents for Article 28.
(http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, then PBH.

Licensing Health Care professionals -- NYS Education Law Articles 130 (including Sub Articles), 131, 131-A, review the tables of content for these articles.
(http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, then EDN.

Session 9: 10/29; Assessment: Discussion
Topic: TB case study—individual rights vs. state power to control infectious disease

Readings/Resources:

Text pp. 208-210 (review again)

NYC Health Code [24 R.C.N.Y], Section 11.21
(http://www.nyc.gov/html/doh/html/about/health-code.shtml)

Gasner MR et al., "The Use of Legal Action in New York City to Ensure Treatment of Tuberculosis", New Eng. J Med 1999; Vol. 340 No. 5, pp. 359-366

Annas, GJ, "Control of Tuberculosis: The Law and the Public's Health", New Eng. J Med 1993; Vol. 328 No. 8, pp. 585-588.

Session 10: 11/5; Assessment: Discussion
Topic: Bloodborne and Sexually Transmitted Infections, HIV/AIDS, AIDS exceptionalism

Readings/Resources:

Text pp. 385-401

Bayer, R. Fairchild AL, “Changing the paradigm for HIV testing--the end of exceptionalism”, New Eng. J Med. 2006; Vol. 355 No.7, pp. 647-649.

NYS Public Health Law Sections 2130, 2133, 2134, 2781, 2782, 2785. (http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, then PBH.

Session 11: 11/12; Assessment: Discussion
Topic: Mandatory School Vaccination

Readings/Resources:
Text pp. 338-360

NYS Public Health Law Section 2164, Subdivisions (2)(a) (requirement) and (b) (booster), (7) (exclusion), (8) (medical exemption), (9) (religious exemption). (http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, then PBH.

Phillips v. City of New York, Second Circuit Court of Appeals (2015). (http://scholar.google.com/scholar_case?case=16052882547509686251&q=Phillips+v.+City+of+New+York&hl=en&as_sdt=3,33)

New California Statute Eliminating Religious Exemption. (http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB277)

Session 12: 11/19; Assessment: Discussion, Religious Exemption Assignment Due
Topic: Public Health Emergencies

Readings/Resources:
Text pp. 262-283

NYS Executive Law Sections 24 (1)(a)- (g) (proclamation of a local state of emergency), 25, 28 (state declaration of disaster emergency). (http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, then EXC.

NYC Health Code [24 R.C.N.Y.] Section 3.01(d). (http://www.nyc.gov/html/doh/html/about/health-code.shtml)

Wilfredo Lopez, Stacie P. Kershner, Matthew S. Penn, “EMAC Volunteers: Liability and Workers’ Compensation”, Biosecurity and Bioterrorism: Biodefense Strategy, Practice and Science, September, 2013, Vol. 11, No. 3: 217 - 225.

Session 13: 12/3; Assessment: Discussion
Topic: Tobacco Control

Readings/Resources
Text pp. 427-451

See summaries of the federal Family Smoking Prevention and Tobacco Control Act (FSPTCA aka Tobacco Control Act of 2009) at:
http://www.lung.org/stop-smoking/tobacco-control-advocacy/federal/fda-regulates-tobacco/what-fda-regulation-of.html
http://www.tobaccofreekids.org/what_we_do/federal_issues/fda/

Session 14: 12/10; Assessment: Discussion
Topic: Identifiable Health Information, Distinguishing Public Health Practice and Human Subjects Research

Readings/Resources
Text pp. 238-261

NYS Public Health Law Section 2441, subdivision 2. (http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:) - click on Laws, Laws of New York, then PBH.

Session 15: 12/17; Assessment: Discussion, Final Paper Due
Topic: Vital Statistics

Readings/Resources:

Schwartz S, The U.S. Vital Statistics System: The Role of State and Local Health Departments, National Academies Press, 2009; 77-86.

Skim through NYC Health Code [24 R.C.N.Y.] Articles 201, 203, 205 and 207. We will discuss several provisions related to birth, death and terminations of pregnancy certificates, including Section 207.05(a)(5) regarding transgender birth certificates. (http://rules.cityofnewyork.us/codified-rules)

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
HPM 75300: Public Health Policy Analysis
3 Credits
Fall 2015

Time and location	SB 329, Thursday, 8-9:45pm
Instructor	Barbara BerneyBarbara Berney, PhD, MPH Associate Professor Office: SB 522 Email: bberneyh@gmail.com Phone: 212 396 7756 Best way to reach me is email. Put HPM753 in the subject line.
Office hours	Thursday 5-7 pm Room 522 Silberman and by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Examines common approaches and concepts of policy analysis for public health, including market efficiency and failures, cost-benefit analysis, problem and decision making analysis; describes critiques of such models with public health examples; focuses on the Health Impact Assessment as a method for analyzing costs and benefits of health and non-health policies.
Course prerequisites	PH 75600, PH 75500
Course format	This class is taught as a combination of lecture, small group work, and seminar format. It is expected that each student will be prepared for and actively participate in each class, both on-line and in-class. In general, there will be a lecture followed by a discussion of the reading. You should be prepared with questions about the reading. You should be prepared to start the discussion by outlining the reading and the issues raised. At the end of the discussion, you should be prepared to summarize the discussion, the implications of the readings and any unresolved issues. Students may be called on at any time to present or wrap up or at any point in the discussion.
Required reading	**Readings may change as the semester progresses:** **TEXTS:**

and resources	Munger MC (2000). *Analyzing Policy: Choices, Conflicts and Practices*. New York: WW Norton.. **(Munger)** Bhatia R. *Health Impact Assessment: A Guide for Practice*. Oakland, CA: Human Impact Partners: 2011. Available from: http://www.healthimpactproject.org/resources/document/Bhatia-2011_HIA-Guide-for-Practice.pdf. Kraft, M. E., & Furlong, S. R. *Public policy: Politics, analysis, and alternatives*. 4th Edition. Sage/CQ Press: 2013. **(Kraft)** Stone, Deborah A. *Policy paradox: The art of political decision making*. 3rd edition. New York, NY: Norton. 2012. **(Stone)** ADDITIONAL REQUIRED READING: (some of thes materials will be available on blackboard) • Brugha, R., & Varvasovszky, Z. (2000). Stakeholder analysis: a review. Health policy and planning, 15(3), 239-246. • Ryan, Charlotte. Prime Time Activism. Chapter 3, Getting Framed; Chapter 4, Framing Contests • Needleman, Critiquing a Research Article • Brandt AM. Inventing conflicts of interest: a history of tobacco industry tactics. Am J Public Health. 2012;102(1):63-71. • Kuo, T., Jarosz, C. J., Simon, P., & Fielding, J. E. (2009). Menu labeling as a potential strategy for combating the obesity epidemic: a health impact assessment. American Journal of Public Health, 99(9), 1680. • **Web:** Stephen J. Entin, "Tax Incidence, Tax Burden, and Tax Shifting: Who Really Pays the Tax? pages 1-11. Availabe at: http://www.heritage.org/Research/Taxes/cda04-12.cfm • McClellan and Skinner, Medicare Reform: Who Pays and Who Benefits, *Health Affairs* (1999), 18:1, 48-62. (on BB) • Congressional Budget Office, THE MEDICARE CATASTROPHIC COVERAGE ACT OF 1988: Staff Working Paper, October 1988 (on BB) • Cost Effectiveness Analysis: Introduction from CDC: http://www.cdc.gov/owcd/eet/costeffect2/fixed/1.html (on BB) • Primer on cost-effectiveness analysis: http://www.acponline.org/clinical_information/journals_publications/ecp/sepoct00/primer.htm (on BB) • Kelman, "Cost-Benefit Analysis: An Ethical Critique" (on BB) • Juusola, J. L., Brandeau, M. L., Owens, D. K., & Bendavid, E. (2012). The cost-effectiveness of pre-exposure prophylaxis for HIV prevention in the United States in men who have sex with men. *Annals of internal medicine*, 156(8), 541-550. • Paltiel, A. D., Freedberg, K. A., Scott, C. A., Schackman, B. R., Losina, E., Wang, B., ... & Walensky, R. P. (2009). HIV preexposure prophylaxis in the United States: impact on lifetime infection risk, clinical outcomes, and cost-effectiveness. *Clinical Infectious*

	Diseases, 48(6), 806-815. • Vilensky, Truvada, the Drug in Cuomo's AIDS-Eradication Plan, Spurs Debate. *WSJ*. Available at: http://online.wsj.com/articles/truvada-the-drug-in-cuomos-aids-eradication-plan-spurs-debate-1405290287 • Cole B, Fielding J. 2007. Health impact assessment: A tool to help policy makers understand health beyond health care. Annual Reviews of Public Health. 28:393-412. • Robert Wood Johnson Foundation, Do Health Impact Assessments Make a Difference? Available from: http://www.rwjf.org/en/research-publications/find-rwjf-research/2014/04/do-health-impact-assessments-make-a-difference-.html. • Dorn, Holahan, Carroll, and McGrath. Medicaid Expansion Under the ACA: How States Analyze the Fiscal and Economic Tradeoffs. June 2013. • National Conference of State Legislatures. Medicaid and the Affordable Care Act. June 2011. At http://www.ncsl.org/documents/health/HRMedicaid.pdf • Analyzing the Impact of State Medicaid Expansion Decisions. Jul 17, 2013; Robin Rudowitz and Jessica Stephens at http://kff.org/medicaid/issue-brief/analyzing-the-impact-of-state-medicaid-expansion-decisions/ • Drew Gonshorowski. Medicaid Expansion Will Become More Costly to States at http://www.heritage.org/research/reports/2012/08/medicaid-expansion-will-become-more-costly-to-states • Community Toolbox, University of Kansas Work Group for Community Health and Development: http://ctb.dept.ku.edu/en; The Health Advocacy Toolbox, Connecticut Health Policy Project, http://www.cthealthpolicy.org/toolbox/default.htm READINGS MAY CHANGE AS THE SEMESTER PROGRESSES
Suggested reading and resources	There are additional suggested, not required, readings for each class listed as part of the class readings. These are more general readings you may find interesting and useful. There are also websites that have data you may find useful for this class. **Recommended Readings** These books are not required for class, but we recommend them as helpful additions to your library. Feel free to add to this list on Blackboard! Blum, H. L. (1974). Planning for Health: Development and Application of Social Change Theory. DeParle, Jason. (2005) *American dream: Three women, ten kids, and a nation's drive to end welfare*. New York, Penguin. [Not about health policy per se, but an excellent account of the complexities and unintended consequences of a major national policy decision.]

Emanuel, E. (2014) *Reinventing American Health Care: How the Affordable Care Act Will Improve our Terribly Complex, Blatantly Unjust, Outrageously Expensive, Grossly Inefficient, Error Prone System.* Public Affairs.

Hacker, JS, Pierson, P. (2011).*Winner-Take-All Politics: How Washington Made the Rich Richer--and Turned Its Back on the Middle Class*. New York, NY: Simon and Schuster.

Markowitz, G., & Rosner, D. (2013). *Lead Wars: The Politics of Science and the Fate of America's Children* (Vol. 24). Univ of California Press.

Munger MC (2000). *Analyzing Policy: Choices, Conflicts and Practices*. WW Norton.

Rudolph, L., Caplan, J., Ben-Moshe, K., & Dillon, L. (2013). *Health in All Policies: A Guide for State and Local Governments*. Washington, DC and Oakland, CA: American Public Health Association and Public Health Institute. Available from: http://www.apha.org/NR/rdonlyres/882690FE-8ADD-49E0-8270-94C0ACD14F91/0/HealthinAllPoliciesGuide169pages.PDF

Webster, D.W. & Vernick J.S. (Eds.). (2013). *Reducing gun violence in America: Informing policy with evidence and analysis*. JHU Press. Full text available at: http://jhupress.files.wordpress.com/2013/01/1421411113_updf.pdf

Policy Resources

Feel free to add your own suggestions to this list on Blackboard!

Policy Process:

- **Overview of the Legislative Process**, Congress.gov: https://beta.congress.gov/legislative-process
- **Annenberg Classroom,** Annenberg Institute for Civics**:** http://www.annenbergclassroom.org/

Toolkits:

- **Community Toolbox**, University of Kansas Work Group for Community Health and Development: http://ctb.dept.ku.edu/en
- **The Health Advocacy Toolbox**, Connecticut Health Policy Project http://www.cthealthpolicy.org/toolbox/default.htm [This site has not been updated in some time, but remains full of relevant, user-friendly information on the ins and outs of the policy process]
- **The Health Impact Project** http://www.healthimpactproject.org
- **Human Impact Partners:** http://www.humanimpact.org/
- **Strategic Corporate Research**: http://strategiccorporateresearch.org/ [Advocacy and campaign design tool from U. Mass Amherst]

Data Sources:

- **Health Policy Briefs**, Health Affairs: http://www.healthaffairs.org/healthpolicybriefs/ [Overviews of current health policy debates]

	• **The Health Reform Monitoring Survey**. Urban Institute, Robert Wood Johnson Foundation, and Ford Foundation: http://hrms.urban.org/ • **Health Reform Resource Center,** The Commonwealth Fund**:** http://www.commonwealthfund.org/interactives-and-data/health-reform-resource-center#/Overview_Timeline • **Influence Explorer**, The Sunlight Foundation: http://influenceexplorer.com/ [Tool to examine lobbying and corporate contributions] • Center for Responsive Politics: http://www.opensecrets.org/ [• **Open Congress:** http://www.opencongress.org/ [Resource for tracking the status of bills and lawmakers. The site also offers a Congress app to follow your legislators] **Think tanks and research organizations** [many of these organizations also have informative Facebook pages and Twitter feeds]: • **Roosevelt House Public Policy Institute at Hunter College:** http://www.roosevelthouse.hunter.cuny.edu/ • **The Commonwealth Fund**: www.commonwealthfund.org • **The Kaiser Family Foundation**: www.kff.org • **PolicyLink:** www.policylink.org/ • **Robert Wood Johnson Foundation**: www.rwjf.org • **The Urban Institute**: www.urban.org

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply relevant theoretical/conceptual models and leadership principles to developing health policy and administrating health programs	• Identify theoretical models for understanding and analyzing policy formulation, implementation and outcomes	Assigned papers and class discussion
Identify and analyze the legal, economic, ethical and health bases and implications of public health policies that affect urban populations	• Use policy analysis tools to understand and assess the policy environment • Assess critiques of public analysis models	Assigned papers and class discussion of CBA, HIA, Stone, Oral Presentation
Apply strategies for advocating for effective public health policies and programs	• Write effective analyses of current public health issues	Assigned papers
Evaluate public health programs and health policies and apply evaluation results to their improvement	• Use policy analysis tools to understand assess the policy environment	• Assigned papers and class discussion and oral presentation
Identify non-public health policies and describe how they can mitigate or exacerbate health disparities and influence the health of urban populations	• Apply the framework and insights of the health impact assessment model to analyze health, healthcare and non-health policies that influence population health	• HIA paper and class discussion
Identify and discuss the partnership and collaborative skills needed to develop effective public health programs and policies	• Describe the benefits of multi-disciplinary and intersectoral approaches to health policy analysis	• Class discussion
Analyze and critically evaluate theoretical	• Explain the role of cost-benefit	• CBA paper and class

and conceptual models used to describe the U.S. health care system and the delivery of health care	analysis, cost-effectiveness analysis and health impact assessment in policy analysis	discussion

Course Assessments

Assessment will be based on student participation in the discussion board, student participation in class discussions and the following assignments:
ASSIGNMENTS

Class Discussion Board. Starting with Class 2, one student each week will be responsible for posting a current news article related to health policy to our discussion board on Blackboard. The article, along with a few comments or questions about why you found this issue particularly interesting, confusing or challenging, should be posted by Friday at midnight. The rest of the class will have until Tuesday at midnight to comment on the articles. We'll take no more than 5-10 minutes at the start of each class to discuss the articles and your comments.

Public Meetings: Due by the beginning of December 3rd class, posted to Blackboard. Over the course of the semester, students will attend a public meeting of their choice. This could be a meeting of the city council, a civic association, a community board, your local police precinct, or another health policy-related meeting that is open to the public. Write a one-page description of the meeting you attended, what policy-related issue was discussed, what data (if any) were presented, and your overall impression.
You can find more information at:

- NYC Public Hearings Calendar: http://rules.cityofnewyork.us/public-hearings-calendar
- Meetings of the City Council and its committees: council.nyc.gov/html/action/calendar.shtml
- NYC Civic Associations: www.nyc.gov/html/cau/html/involved/civic.shtml
- NYC Community Boards: www.nyc.gov/html/cau/html/cb/cb.shtml
- NYPD Bureau of Community Affairs: http://www.nyc.gov/html/nypd/html/community_affairs/community_affairs.shtml

Assignment 1: Due by Tuesday, September 16, posted to Blackboard. Find a recent article about a health problem from a newspaper, magazine, blog, or other news source. Write a 2-page paper examining how the story explains 1) what the problem is; 2) why it is a problem, 3) whose problem it is; and 4) what should or can be done about it. Think about: how did the news source choose to define this problem? Do you agree or disagree with the framing and potential solutions? Are there additional stakeholders who were not mentioned in the story? We will use these as the basis of our class discussion. Please use a different article from the one you brought in the first day of class. Please write an essay that address all these questions rather than a list of questions and answers.

Assignment 2 (Due Tuesday October 13):
You are Louis Bird, committee staff. Write a 2 page memo with your assessment of the findings from the GAO report and implications for committee action. What is your estimate of the impact of WIC of low birth weight, and what is the implication. Take the closing question in the case as your task.

Assignment 3 Due Oct 29:

Use the literature on using statins as a primary prevention for heart disease/cardio-vascular events to do a cost-effectiveness analysis of expanding the use of statins. You do not need to calculate the costs of side-effects or risks but you should discuss them. Use the following to do your analysis.

Objective: To estimate the effectiveness and cost-effectiveness of expanding use of statins to men with greater than 10% risk of a cardio-vascular event

Design: You choose

Data Sources: Published literature.
Target Population: You may limit your analysis to men of a certain age if you like.

Perspective: Societal.

Intervention: expand use of statins

Outcome Measures: you choose: must have a disease/event measure, a cost measure (e.g. $/QALY; $/event avoided; $/death avoided) and a cost effectiveness ratio. You might also consider comparing expanded use of statins with life-style interventions or at least explain how you could do this.

Results of Base-Case Analysis: Using statins in x% of population (describe population) will result in y change in cardio vascular events and a change of z QALYs over xx years at a cost of yy/QALY and zz/avoided event. Impact of giving statins to larger % of population

Limitations:

Conclusion:

Assignment 4: Due Nov5 . NO LATE ASSIGNMENTS ACCEPTED. You are on Gov Tom Wolf's staff:

- ***If your last name begins with A-G,*** Set up a Cost –Benefit analysis of HVHF in Pennsylvania. Provide a list of all the benefits, including to whom they accrue and how you would monetize them. Provide a list of all the costs, including to whom they would accrue and monetize them. Explain where the data will come from for determining costs and benefits and monetizing them. You may provide all this information in a chart. Explain in 2 pages or less, what issues you cannot or will not address in your cost-benefit analysis and discuss their importance.
- ***If your last name begins with H-R***, set up an HIA of HVHF in Pennsylvania. As you can see from the NAS report there are six steps to a Health Impact Assessment http://www.nap.edu/catalog.php?record_id=13229 . Look especially at the Scoping and Assessment portions as noted on page 7. In a flow chart (a neat hand drawn chart is fine) note how HVHF will have both beneficial and adverse health effects and enumerate each one of these. For each

of the sub-boxes on the chart, note how you would amplify benefits and mitigate risks. On a separate page briefly enumerate the stakeholders you would include. At the end of the two pages, you should offer a brief recommendation with the caveats and reasons (avoiding advocacy language).

- **DUE NOV 12: NO LATE ASSIGNMENTS ACCEPTED *If your last name begins with S-Z,*** using the papers posted by students last week, write a 2 page memo to the governor explaining why he should use HIA or Cost-Benefit analysis in deciding whether to allow HVHF in Pennsylvania. You may use charts or tables in addition to your 2 pages.

Assignment 5 and 6: Participate in a group project to design a strategy for achieving or opposing Adoption of Medicaid expansion in Tennessee. The strategy needs to address what the scope of the proposal will be, identification of supporters and opponents, messaging and framing approaches to promote or oppose the policy, and scope and focus of lobbying and/or building public support or opposition. Messaging and framing and coalition building are often linked. **Each group will make a presentation to the class as a pitch to a client by a campaign consultant on Nov 19**. Turn in your notes and presentation. **A paper describing the strategy will be submitted a week after the presentations Nov 26.**

Final Oral Presentation: Students will make a brief presentation (no more than 4 minutes) on a health policy issue of their choice. Your presentation should focus on persuading a stakeholder (an elected official, businessperson, philanthropist, etc.) to take interest in and act on a specific issue. Your stakeholder will want to know: Why should I care? What do I need to know? What are the memorable data? Will this make a difference and how will we know? You will need to be cogent and clear, with enough facts to be authentic and enough narrative to be interesting. We will provide more detailed guidelines later in the semester.

Grading

Evaluation criteria

Rubric for assignments posted to BB

The relative weight of each course component is as follows:

Assessment	Weight
Discussion Board	5%
Class Discussion	10%
public meeting write-up	10%
Paper 1: recent article	5%
Paper 2: WIC	10%
Paper 3: CB/CE	10%
Paper 4 HIA 1	10%

Paper 5 HIA 2	10%
Group proj Medicaid oral	10%
Medicaid paper	10%
Final oral presentation	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Attendance will be taken. Each student is expected to attend and actively participate in each class. One absence is allowed. Save it for when you need it. Each additional absence will result in a penalty of 10 points from the course grade, with almost no exceptions.

Class participation counts and will be taken into consideration in grading as follows: Exceptional participation – e.g., repeated discussion leadership, insight into the analytic issues in the cases – will, at the discretion of the professor, result in a half-letter grade increase in your final grade. Repeated, demonstrated failure to be prepared to participate in class will result in a half-letter grade decrease in the final grade.

Late/incomplete submission of assignments

Written assignments will not be accepted late.

Make-ups, rewrites, and extra credit

No make ups or extra credit. Any student who wishes to re-write a paper may. I will regrade it.

Expectations of students

Each student is expected to attend and actively participate in each class. You are expected to have read and thought about the readings and the cases before coming to class. You may be called on at any time to present or summarize a case or reading. It is also expected that you will listen to and think about what other students say in class and respond thoughtfully and respectfully. Please bring your experience into the class. It is what we have to offer each other. If you have questions about the readings, please post them on the board when you come in to class or post them on Blackboard before class. It is also expected that students will complete all written and oral presentation assignments and turn them in on time.

This course is delivered using the Blackboard course management system. In addition, students may be required to submit course assignments from time to time to the instructor electronically using Hunter or other CUNY e-mail. **An active Hunter or CUNY student e-mail user ID and password is required to log into both Blackboard and e-mail.** An active CUNY e-mail ID is required for non-Hunter students taking the class. Blackboard and Hunter/CUNY e-mail will be used for communicating with the instructor, for receiving some supplemental course materials, and for submitting assignments. It is the responsibility of the student to remain current on this system.

Expectations for the instructor

The instructor will introduce each topic and type of analysis and lead a discussion based on the readings and cases. Each student's papers will be graded and commented on and returned as promptly as possible. The instructor is available for discussion during office hours and by appointment.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester.
Please check the the current academic calendar for important dates (for example: holidays, course drop, course withdrawal). Available at http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%208-24-2015.pdf

TOPICS

Class 1: Thursday. August 27
Introduction

- Introductions
- Syllabus
- What is policy? What is policy analysis?
- *Assignment: read the newspaper/blog and find an example of policy analysis*

Class 2: Thursday. September 3
How Policy Works: The Policy Process, Policy Actors, and Strategic Intervention Points

- How is policy proposed, negotiated and implemented?
- Who are the official and unofficial actors?
- Limits of policy analysis

No class September 10

Class 3: Thursday September 17
What's the Problem? Problem Definition, Stakeholder Analysis, and Framing

- Problem Definition: What is the problem?
- Framing: Why is it a problem?
- Stakeholder Analysis: Whose problem is it?

Case: Philadelphia or Fracking

Class 4: Thursday. September 24
Policy Tools: What Can Government Do? The private sector?

- What policy levers can we use?
- Do, Regulate, Tax, Subsidize, or Educate?

Case: Philadelphia A

Class 5: Thursday. October 1
Putting the Problem in Context: Reviewing the Literature and Collecting Data

- Reviewing and critiquing the literature
- Identifying and using data
    - What are the relevant data?

- Where do you get the data
- What do you do with the data (analysis)
- What data can you trust?

Case: WIC

Class 6 (October 8), and Class 8 (October 22)
Cost-Benefit and Cost-Effectiveness Analysis: What are cost-benefit and cost-effectiveness analyses?

- Who pays, and who benefits?
- Ethics and equity
- How does the choice of analytic tool affect policy recommendations?
- How do you do a CBA

Case: PrEP

Class 7 (October 15) Guest lecture: Jack Needleman:
Tax incidence: Who pays

Case: Medicare Catastrophic: CBO report

Class 8 October 22 (Cost-Benefit and cost Effectiveness) see above

Class 9 (October 29) and 10 (November 5)
Health Impact Assessment:

- What is health impact assessment? What is "health in all policies"?
- Equity in health impact assessment
- Convening stakeholders and coalition building
- Making your case

Case: Fracking

Class 11: Thursday. November 12
What determines policy and where does analysis fit?

- Medicaid Expansion
  - What is the problem? What is at stake?
  - Role of values and ideology
  - Who pays? States, federal government, individuals, employers
  - Coverage: who should be covered
  - Role of the private sector

Case: Medicaid Expansion: Tennesee

Class 12: November 19
Telling the Story: Disseminating Findings/Advocacy/Unintended Consequences

- How do you communicate your findings?
- Who do you communicate them to?
- How do you use your findings to move policy forward?

Case: Medicaid expansion; fracking what do people value; where do they get their info from; whose info do you trust and why?

THANKSGIVING NOVEMBER 26: NO CLASS

Class 13 (December 3): wrap up and catch up

Class 14 (December 10): Student Presentations

Class 15 (December 17): Student Presentations

CLASS READINGS AND ASSIGNMENTS

Class 1, Thursday August 27: Introduction

Readings:

- **Kraft and Furlong**, *Public Policy: Politics, Analysis, and Alternatives.* Policy Analysis *(*Chapter 4)
- **Stone,** *Policy Paradox*, The Market and the Polis (Chapter 1); skim chapters on Symbols and Numbers

Assignment Due: Read a daily paper or blog if you prefer and find an article about health policy. Bring it to class. Identify 1)what policy it discusses; 2) whether it argues for or against the policy or just analyzes it; 3) who is making (or to make) the policy; 4) who are the stakeholders; 5)how is the policy analyzed: what data or information are presented and how are they used?

Class 2, Thursday. September 3: How Policy Works: The Policy Process, Policy Actors, and Strategic Intervention Points

Readings:

- Kraft and Furlong, Government Institutions and Policy Actors (Chapter 2); Understanding the Politics of Public Policy (Chapter 3)
- Stone, Interests (Chapter 10)
- Munger, Policy Analysis as a Profession and a Process (Chapter 1) and The Limits of Policy Analysis (Chapter 5)

Suggested, not required:

- Munger, Democracy and Government "Failure"

SEPTEMBER 10: CLASSES FOLLOW MONDAY SCHEDULE. NO POLICY ANALYSIS CLASS

Class 3: Thursday, September 17: What's the Problem? Problem Definition, Stakeholder Analysis, and Framing

Readings:

- Stone, Symbols (Chapter 7) and Causes (Chapter 9)

- Bardach, Defining the Problem (Step 1)
- Brugha, R., & Varvasovszky, Z. (2000). Stakeholder analysis: a review. Health policy and planning, 15(3), 239-246.
- Ryan, Charlotte. Prime Time Activism. Chapter 3, Getting Framed; Chapter 4, Framing Contests.
- Case Philadelphia Get from the Kennedy School of Government Website case 1649: Public Takes on Private: The Philadelphia Behavioral Health System

Suggested, not required:

- Dorfman, L., Wallack, L., & Woodruff, K. (2005). More than a message: Framing public health advocacy to change corporate practices. Health Education & Behavior, 32(3), 320-336.
- Berkeley Media Studies Group and the Praxis Project. Meta Messaging: Framing Your Case and Reinforcing Your Allies. January 2005. Available from: http://www.bmsg.org/resources/publications/meta-messaging-framing-your-case-and-reinforcing-your-allies.

Assignment 1: Due by Monday, September 15, posted to Blackboard. Find a recent article about a health problem from a newspaper, magazine, blog, or other news source. Write a 2-page paper examining how the story explains 1) what the problem is; 2) why it is a problem, 3) whose problem it is; and 4) what should or can be done about it. Think about: how did the news source choose to define this problem? Do you agree or disagree with the framing and potential solutions? Are there additional stakeholders who were not mentioned in the story? We will use these as the basis of our class discussion.

Class 4: Thursday. September 24: Policy Tools: What Can Government Do?

Readings:

- Kraft and Furlong, Public Problems and Policy Alternatives (Chapter 5)
- Stone, Decisions (Chapter 11)
- Bardach, Construct Alternatives , Select the Criteria, Project the Outcomes (Steps 3-5); review Appendix B, Things Governments Do
- Case: Philadelphia

Recommended (not required):

- Munger, Choice of Regulatory Form, Efficiency, Equity or Politics?

Class 5: Thursday, October 1: Putting the Problem in Context: Reviewing the Literature and Collecting Data

Readings:

- Needleman, Critiquing a Research Article
- Bardach, *The Eightfold Path*, Assembling Evidence (Part 2; also review Steps 2-4 in Part 1)
- Stone, Numbers (Chapter 8)
- Brandt AM. Inventing conflicts of interest: a history of tobacco industry tactics. Am J Public Health. 2012;102(1):63-71.

- Kuo, T., Jarosz, C. J., Simon, P., & Fielding, J. E. (2009). Menu labeling as a potential strategy for combating the obesity epidemic: a health impact assessment. American Journal of Public Health, 99(9), 1680.

Case:

KSG case 680: Conflicting Findings: Evaluating WIC

Assignment (Due Tuesday September 29 on Blackboard):

- You are Louis Bird, committee staff. Write a 2 page memo with your assessment of the findings from the GAO report and implications for committee action. What is your estimate of the impact of WIC of low birth weight, and what is the implication. Take the closing question in the case as your task.

Suggested readings (not required):

- For those with a limited background in statistics and regression, the Federal Judicial Center's Reference Mannual on Scientific Evidence has two useful chapters:
  - Reference Guide on Statistics
  - Reference Guide on Multiple Regression

    Available at: http://www.fjc.gov/library/fjc_catalog.nsf/autoframepage?openform&url=/library/fjc_catalog.nsf/bysubjectfrm?openform&category=Scientific+Evidence
- Martens, P (2012) The Right Kind of Evidence—Integrating, Measuring, and Making It Count in Health Equity Research *J Urban Health*. Dec 2012; 89(6): 925–936.
- Shermer, M. Baloney Detection kit (video). Available at: http://www.michaelshermer.com/2009/06/baloney-detection-kit/
- Asthana, S., & Halliday, J. (2006). Developing an evidence base for policies and interventions to address health inequalities: the analysis of "public health regimes". Milbank Quarterly, 84(3), 577-603.

Class 6, October 8: Cost-Benefit and Cost-Effectiveness Analysis

Readings:

- Munger, Cost-Benefit Analysis (Chapter 11)
- Cost Effectiveness Analysis: Introduction from CDC: http://www.cdc.gov/owcd/eet/costeffect2/fixed/1.html
- Primer on cost-effectiveness analysis: http://www.acponline.org/clinical_information/journals_publications/ecp/sepoct00/primer.htm
- Kelman, "Cost-Benefit Analysis: An Ethical Critique"

Additional resources: not required

- CBO on Prevention: https://www.cbo.gov/ftpdocs/104xx/doc10492/08-07-Prevention.pdf
- Trust for America's Health prevention report: http://healthyamericans.org/reports/prevention08/Prevention08.pdf
- Example of a cost-benefit analysis: Jeffrey Chow, Sarah Darley, and Ramanan Laxminarayan. Cost-effectiveness of Disease Interventions (Treating Vitamin A

Deficiency) in India Available at http://www.rff.org/Publications/Documents/RFF-DP-07-53.pdf

Class 7: Thursday, October 15: Guest Lecturer: Jack Needleman: Tax Incidence: Who Pays

Readings:

- **Web:** Stephen J. Entin, "Tax Incidence, Tax Burden, and Tax Shifting: Who Really Pays the Tax? pages 1-11. Availabe at: http://www.heritage.org/Research/Taxes/cda04-12.cfm
- McClellan and Skinner, Medicare Reform: Who Pays and Who Benefits, *Health Affairs* (1999), 18:1, 48-62. (available from the Hunter Library websiite)
- Congressional Budget Office, THE MEDICARE CATASTROPHIC COVERAGE ACT OF 1988: Staff Working Paper, October 1988

  Skim pages 1-6, read 7-21 focus on tables 9-11. Be prepared to discuss these questions:

  i. Is the proposed financing progressive, regressive or proportional?
  ii. What is the incidence of the premiums by income level (try graphing premiums against income)
  iii. Will some beneficiaries be asked to pay more than they currently pay for equivalent Medigap policies (may not be addressed in CBO report)
  iv. Is the incidence "fair"? Should high income Medicare beneficiaries subsidize low income beneficiaries?

Class 8, October 22: CBA :Case – Reducing HIV Infection through Pre-Exposure Prophylaxis (PrEP)

Readings:

- Juusola, J. L., Brandeau, M. L., Owens, D. K., & Bendavid, E. (2012). The cost-effectiveness of pre-exposure prophylaxis for HIV prevention in the United States in men who have sex with men. *Annals of internal medicine*, 156(8), 541-550.
- Paltiel, A. D., Freedberg, K. A., Scott, C. A., Schackman, B. R., Losina, E., Wang, B., ... & Walensky, R. P. (2009). HIV preexposure prophylaxis in the United States: impact on lifetime infection risk, clinical outcomes, and cost-effectiveness. *Clinical Infectious Diseases*, 48(6), 806-815.
- Vilensky, Truvada, the Drug in Cuomo's AIDS-Eradication Plan, Spurs Debate. *WSJ*. Available at: http://online.wsj.com/articles/truvada-the-drug-in-cuomos-aids-eradication-plan-spurs-debate-1405290287

- Suggested reading, not required:
  - Skim through these sites:
    - AVAC: http://www.avac.org/prevention-option/prep
    - PrEP Watch: http://www.prepwatch.org/
  - Murphy, Sex Without Fear, *New York Magazine*: http://nymag.com/news/features/truvada-hiv-2014-7/

Come to class prepared to argue for or against prescribing Truvada for PrEP, and for whom, using data.

Assignment Due November 5:

Use the literature on using statins as a primary prevention for heart disease/cardio-vascular events to do a cost-effectiveness analysis of expanding the use of statins. You do not need to calculate the costs of side-effects or risks but you should discuss them. Use the following to do your analysis.

Objective: To estimate the effectiveness and cost-effectiveness of expanding use of statins to men with greater than 10% risk of a cardio-vascular event

Design: You choose

Data Sources: Published literature.
Target Population: You may limit your analysis to men of a certain age if you like.

Perspective: Societal.

Intervention: expand use of statins

Outcome Measures: you choose: must have a disease/event measure, a cost measure (e.g. $/QALY; $/event avoided; $/death avoided) and a cost effectiveness ratio. You might also consider comparing expanded use of statins with life-style interventions or at least explain how you could do this.

Results of Base-Case Analysis: Using statins in x% of population (describe population) will result in y change in cardio vascular events and a change of z QALYs over xx years at a cost of yy/QALY and zz/avoided event. Impact of giving statins to larger % of population

Limitations:

Conclusion:

Class 9, October 29: Health Impact Assessment

Readings:

- Bhatia R. Health Impact Assessment: A Guide for Practice. Oakland, CA: Human Impact Partners, 2011. Available from: http://www.healthimpactproject.org/resources/document/Bhatia-2011_HIA-Guide-for-Practice.pdf.
- Cole B, Fielding J. 2007. Health impact assessment: A tool to help policy makers understand health beyond health care. Annual Reviews of Public Health. 28:393-412.
- Robert Wood Johnson Foundation, Do Health Impact Assessments Make a Difference? Available from: http://www.rwjf.org/en/research-publications/find-rwjf-research/2014/04/do-health-impact-assessments-make-a-difference-.html.
- Skim these resources for some examples of HIAs and HIA toolkits:
    - http://www.healthimpactproject.org/hia/case-studies
    - http://www.humanimpact.org/

- EPA. Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: Progress Report at http://www2.epa.gov/hfstudy/study-potential-impacts-hydraulic-fracturing-drinking-water-resources-progress-report-0
    - Executive summary (PDF)
    - Introduction (PDF)
    - Overview of the Research Program (PDF)
    - Conducting High Quality Science (PDF)
    - Research Progress Summary and Next Step (PDF)
- NY State health Department. A Public Health Review of High Volume hydraulic fracturing for Shale Gas Development http://www.health.ny.gov/press/reports/docs/high_volume_hydraulic_fracturing.pdf

COME TO CLASS PREPARED TO DISCUSS:

A framing of the problem, using current and relevant data 2) Which stakeholders you will need to engage, 2) Potential health impacts (both positive and negative) and the stakeholders they will impact, 3) Potential data sources, 4) How you will distribute your findings, and to whom

Assignment: Due Nov 5. NO LATE ASSIGNMENTS ACCEPTED. You are on Gov Tom Wolf's staff:

- If your last name begins with A-G, Set up a Cost –Benefit analysis of HVHF in Pennsylvania. Provide a list of all the benefits, including to whom they accrue and how you would monetize them. Provide a list of all the costs, including to whom they would accrue and monetize them. Explain where the data will come from for determining costs and benefits and monetizing them. You may provide all this information in a chart. Explain in 2 pages or less, what issues you cannot or will not address in your cost-benefit analysis and discuss their importance.
- If your last name begins with H-R, set up an HIA of HVHF in Pennsylvania. As you can see from the NAS report there are six steps to a Health Impact Assessment http://www.nap.edu/catalog.php?record_id=13229 . Look especially at the Scoping and Assessment portions as noted on page 7. In a flow chart (a neat hand drawn chart is fine) note how HVHF will have both beneficial and adverse health effects and enumerate each one of these. For each of the sub-boxes on the chart, note how you would amplify benefits and mitigate risks. On a separate page briefly enumerate the stakeholders you would include. At the end of the two pages, you should offer a brief recommendation with the caveats and reasons (avoiding advocacy language).

Class 10, November 5: HIA Case - Fracking

Readings:

- NAS. Improving Health in the United States available for download at http://www.nap.edu/catalog.php?record_id=13229
- IOM (Institute of Medicine). 2013. Health impact assessment of shale gas extraction: Workshop summary. Washington, DC: The National Academies Press.
- Jacquelyn Pless. Natural Gas Development and Hydraulic Fracturing A Policymaker's Guide http://www.ncsl.org/documents/energy/frackingguide_060512.pdf
- NRDC. Fracking in PA at http://www.nrdc.org/energy/fracking-map/pa.asp

- David Biello. Fracking can be done safely but will it be? Scientific American at http://www.scientificamerican.com/article.cfm?id=can-fracking-be-done-without-impacting-water
- Kevin Begos. Pennsylvania Fracking Study Shows Chemicals Did Not Contaminate Water 07/19/13 at http://www.huffingtonpost.com/2013/07/19/pennsylvania-fracking-study_n_3622512.html
- Conventional Politics for Unconventional Drilling? Lessons from Pennsylvania's Early Move into Fracking Policy Development. By: Rabe, Barry G.; Borick, Christopher. Review of Policy Research. May2013, Vol. 30 Issue 3, p321-340. 20p. DOI: 10.1111/ropr.12018.
- *Halliburton Loophole* - The Institute for Energy and Environmental at http://energy.wilkes.edu/PDFFiles/Laws%20and%20Regulations/Halliburton%20Loophole%20Essay%20Final.pdf

Assignment DUE NOV 10: NO LATE ASSIGNMENTS ACCEPTED If your last name begins with S-Z, using the papers posted by students last week, write a 2 page memo to the governor explaining why he should use HIA or Cost-Benefit analysis in deciding whether to allow HVHF in Pennsylvania. You may use charts or tables in addition to your 2 pages.

Class 11, November 12: The Affordable Care Act: Expanding Medicaid

Readings:

- Kraft and Furlong, Health Care Policy (Chapter 8; if you have an earlier edition of this book, please review the 4th edition on reserve)
- Dorn, Holahan, Carroll, and McGrath. Medicaid Expansion Under the ACA: How States Analyze the Fiscal and Economic Tradeoffs. June 2013.
- National Conference of State Legislatures. Medicaid and the Affordable Care Act. June 2011. At http://www.ncsl.org/documents/health/HRMedicaid.pdf
- Analyzing the Impact of State Medicaid Expansion Decisions. Jul 17, 2013; Robin Rudowitz and Jessica Stephens at http://kff.org/medicaid/issue-brief/analyzing-the-impact-of-state-medicaid-expansion-decisions/
- Drew Gonshorowski. Medicaid Expansion Will Become More Costly to States at http://www.heritage.org/research/reports/2012/08/medicaid-expansion-will-become-more-costly-to-states
- Additional material available at Kaiser Family Foundation (go to kff.org and enter a search for Medicaid and ACA)

Suggested readings:

- Kaiser Family Foundation
- Summary of the Affordable Care Act: http://kff.org/health-reform/fact-sheet/summary-of-the-affordable-care-act/
- State Profiles: How Will the Uninsured Fare Under the Affordable Care Act? http://kff.org/state-profiles-uninsured-under-aca/
- Visualizing Health Policy: Understanding the Effect of Medicaid Expansion Decisions in the South: http://kff.org/infographic/visualizing-health-policy-understanding-the-effect-of-medicaid-expansion-decisions-in-the-south/

Assignment: Participate in a group project to design a strategy for achieving or opposing Adoption of Medicaid expansion in Tennessee. The strategy needs to address what the scope of the proposal will be, identification of supporters and opponents, messaging and framing approaches to promote or oppose the policy, and scope and focus of lobbying and/or building public support or opposition. Messaging and framing and coalition building are often linked. **Each group will make a presentation to the class as a pitch to a client by a campaign consultant on Nov 19.** Turn in your notes and presentation. **A paper describing the strategy will be submitted a week after the presentations Nov 26.**

Class 12, November 19: Disseminating Findings and Following Up/Unintended Consequences

Readings:

- Bardach, Project the Outcomes; Confront the Trade-offs (Steps 5 and 6)
- Take a look at two advocacy toolkits: Community Toolbox, University of Kansas Work Group for Community Health and Development: http://ctb.dept.ku.edu/en; The Health Advocacy Toolbox, Connecticut Health Policy Project, http://www.cthealthpolicy.org/toolbox/default.htm

Class 13 (December 3) wrap up and catch up
Assignment: (Public Meeting Assignment) due, posted to Blackboard by the beginning of class.

Class 14 (December 10) Student Presentations

Class 15 (December 17)Student Presentations

Last Updated August 17, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
NUTR 72000: Community Nutrition Education
3 Credits
Fall 2015

Time and location	TUESDAYS 5:25 TO 7:55 PM Silberman Building Room 217
Instructor	Assistant Professor, May May Leung, PhD, RD mm.leung@hunter.cuny.edu [best way to reach is via email] 212-396-7774 Teaching Assistants: Olivia Barata-Cavalcanti, MPH, MIA obaratacavalcanti@gradcenter.cuny.edu Rachel Taniey, MS, RD rtaniey@gradcenter.cuny.edu
Office hours	Tuesdays, 3:15 – 5:15 pm (appointment recommended)
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Nutrition programs and materials for health promotion in the community
Course prerequisites	N/A
Course format	Hybrid (lecture and online)
Required reading and resources	All required readings will be posted on Blackboard. Boyle MA, Holben DH. Community Nutrition in Action. 6th ed. Florence (KY): Cengage Learning; 2012. Retail price: $ 198.32 (Recommended)
Suggested reading and resources	**Food and Nutrition Information Center** http://fnic.nal.usda.gov **Healthy People 2020** http://www.healthypeople.gov/HP2020 **Academy of Nutrition and Dietetics** http://www.eatright.org

AND Foundation Knowledge and Skills: Learning Outcomes	**Course Learning Objectives**	**Assessment Methods**
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Demonstrate how to locate, interpret, evaluate and use professional literature to make ethical evidence-based practice decisions. (KR 1.1.a)	• Locate and synthesize empirical information about nutrition and health promotion strategies • Identify evidence-based health promotion strategies appropriate for a target population	• Discussion • Fact vs. Fiction: Nutrition Recommendation Presentation • Project Paper • Project Presentation
Demonstrate effective and professional oral and written communication and documentation and use of current information technologies when communicating with individuals, groups and the public. (KR 2.1.a)	• Identify effective methods of communicating evidence-based nutrition information for different populations • Adapt nutrition education materials for a target population using current information technologies	• Community Stakeholder Interview • Cultural Competency Education Material • Project Paper • Project Presentation
Apply knowledge of the role of environment, food and lifestyle choices to develop interventions to affect change and enhance wellness in diverse individuals and groups. (KR 3.2 a)	• Identify social and environmental determinants that contribute to community nutrition-related health outcomes • Discuss strategies that could effectively address the health needs of diverse populations	• Discussion • Food Stamp Challenge • Community Stakeholder Interview • Logic Model • Project Paper • Project Presentation
Develop an educational session or program/educational strategy for a target population. (KR 3.3.a)	• Identify cultural competency factors that should be considered in nutrition education materials and programs • Design a culturally-competent nutrition education program to promote health in a target population	• Community Stakeholder Interview • Logic Model • Cultural Competency Education Material • Project Paper • Project Presentation
Develop outcome measures, use informatics principles and technology to collect and analyze data for assessment and evaluate data to use in decision-making (KR 4.2.b)	• Identify current technology used for data collection and analysis • Outline appropriate measures to evaluate outcomes of a nutrition education program	• Logic Model • Project Paper • Project Presentation

Explain the impact of a public policy position on dietetics practice. (KR 4.3.a)	• Identify a public policy position relevant to dietetics practice. • Discuss how the public policy position could impact community-based dietetics practice.	• Discussion • Food Stamp Challenge

Accreditation Council for Education in Nutrition and Dietetics (ACEND) Core Knowledge Requirements

KRD 1.1: The curriculum must reflect the scientific basis of the dietetics profession and must include research methodology, interpretation of research literature and integration of research principles into evidence-based practice.
KRD 2.1: The curriculum must include opportunities to develop a variety of communication skills sufficient for entry into pre-professional practice.
KRD 3.2: The curriculum must include the role of environment, food, nutrition and lifestyle choices in health promotion and disease prevention.
KRD 3.3: The curriculum must include education and behavior change theories and techniques.
KRD 4.3: The curriculum must include the fundamentals of public policy, including the legislative and regulatory basis of dietetic practice.
KRD 5.3: The behavioral and social science foundation of the dietetics profession must be evident in the curriculum. Course content must include concepts of human behavior and diversity, such as psychology, sociology or anthropology.

Course Assessments

Your understanding of the course material will be evaluated through multiple assignments, an individual presentation, a final group paper and presentation, and class discussion/participation.

Below is a brief description of the course assessments. Details about the assignments and grading criteria will be available on the course website.

Food Stamp Challenge (40 points): For this experiential assignment, each student will develop a meal plan using the budget of an individual on "food stamps" (SNAP EBT card), then carry out the meal plan and reflect upon the experience.

Community Stakeholder Interview (40 points): Conduct a qualitative, in-depth interview (~15 - 20 minutes) with a community stakeholder to better understand the health problems/needs of his/her community and what nutrition education materials could be adapted for this specific community.

Logic Model (40 points): Develop a logic model for a program/intervention for a health problem in a specific population.

Fact vs. Fiction: Diets and Nutrition Recommendations (60 points): Select a current diet or nutrition recommendation. Describe it and summarize the current evidence-base, highlighting whether or not the literature supports or 'debunks' the diet/recommendation. This will be done in a 5-minute presentation to the class on your assigned date.

Cultural Competency Nutrition Education Material (40 points): Select a nutrition or physical activity education material (e.g., hand-out, website) that was developed for the lay population related to a public health nutrition issue. Based upon the information collected from your community stakeholder interview, tailor the education material to meet the needs of a specific population.

Nutrition Education Final Group Project (140 points): In a paper and presentation, your group will develop an evidence-based nutrition education program for a specific population/community.

Your final project and presentation should include the following sections:

- Background and Significance
- Description and Lesson Plan
- Evaluation
- Logic model of the proposed project
- Appendices

Class Participation: Discussion forums, in-class discussion, interactive communication and the attitude you display towards others will be a part of your final grade.

Grading

Evaluation criteria

All assignments will be assessed based upon a rubric. Specific information about grading criteria and rubric will be distributed with the assignment.

The relative weight of each course component is as follows:

Food Stamp Challenge	10%
Community Stakeholder Interview	10%
Logic Model	10%
Cultural Competency Material	10%
Fact vs. Fiction Presentation	15%
Final Group Project: Paper	30%
Final Group Project: Presentation	10%
Participation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Expect to actively contribute to the discussion and complete and submit all assignments by posted due dates. Missed assignments or lack of discussion participation not only affect the individual student, but they also affect the class as a whole due to the high degree of interaction within the course. Interactive communication and the attitude you display towards others will be a part of your final grade (as class participation). Expect to attend each class on time, thus frequent days of lateness will also be marked and deducted as part of your final grade.

Absences due to religious holidays/beliefs: Each student who is absent from class because of his/her religious beliefs will be given an equivalent opportunity to make up examination or assignment that s/he may have missed. No student will be penalized for absence due to religious beliefs, and alternative means will be sought for satisfying the academic requirements involved. Please inform the course instructor ahead of time (at least one week prior to a scheduled absence) so that alternative options can be scheduled accordingly.

Late/incomplete submission of assignments

Five (5) percentage points will be deducted for each day after the due date an assignment is submitted. NO ASSIGNMENT WILL BE ACCEPTED AFTER A WEEK FROM THE DUE DATE.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit allowed.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete and upload all assignments by their assigned due date onto Blackboard. NO hard copy or emailed versions of assignments will be accepted.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and may be posted on Blackboard.
- Contact the professor or TA directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.
- Turn off (or silence) all communication devices when entering the classroom.

Expectation for written assignments:

Students may work with their peers **for feedback and discussion** on assignments and the paper; however the final version of these assignments **must reflect independent work and be written in each student's own language**. When working on the assignments and paper, students need to follow these guidelines:

- Reference and identify all sources and quotations. If there is any doubt about proper procedures, students should consult the instructor.
- If another person's ideas are used or paraphrased acknowledge the source in a proper citation,
- If actual words or expressions of another person or source, including the Internet, are used, indicate such use by incorporation of quotation marks and a proper citation.
- Provide your own work, not someone else's. Examples of using someone else's work include: submitting essays or portions of essays written by other people as one's own; or collaborating with others on an assignment or examination without specific permission from the instructor to do so.
- Do not submit material prepared for one course to fulfill the requirements for this course.

Expectations for the instructors

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 to 48 hours Monday through Friday.

- Grading and feedback on assignments within 2 weeks of the due date.
- Communication about grades and progress in the course will be given through the course website.
- Answer any specific questions related to assignments prior to submission. However, to ensure fairness and feasibility for the class, instructor/TA's are NOT able to review and evaluate assignments prior to submission.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings	Assessment
1	Sep 1	Course Overview; Introduction to Community Nutrition	Chap. 1	Discussion
2	Sep 8	Diet-related Chronic Diseases; Food Insecurity; Dietary Guidelines	Chap. 10; Satia *Diet-related Disparities*	Discussion, FS Challenge
	Sep 15	NO CLASS *Note: Sept 16 - Last day to drop without a grade of "W"*		
	Sep 22	NO CLASS		
3	Sep 25	Community Engagement; Community Assessment Methods (online)	Articles re: *Community Engagement & CBPR*	Discussion, CS Interview
4	Sep 29	Library Session; Ethics **FS Challenge Assignment Due**	Chaps. 2 and 3	Discussion, Paper, Presentation
5	Oct 6	Community Nutrition Programs: Evidence-Based Decisions and Intervention Strategies; Planning **CS Interview Assignment Due**	Articles re: *Recommended Strategies*	Discussion, Paper, Presentation
6	Oct 13	Community Nutrition Programs: Implementation & Evaluation (online)	Articles re: *Implementation & Evaluation Planning*	Discussion, CS Interview, Logic Model, Paper, Presentation
7	Oct 20	Logic Models; Social Ecologic Model; Health Behavior Theories	Articles re: *Logic Models;* NCI's *Theory at a Glance- Part 2*	Discussion, Logic Model, Paper, Presentation
8	Oct 27	Principles of Nutrition Education (online)	Chap. 17	Discussion, CS Interview
9	Nov 3	Guest speaker (NYC DOHMH Center for Health Equity Nutrition Programs) *Note: Nov 9 - Last day to withdraw with a grade of 'W'* **Logic Model Assignment due**		Discussion

10	Nov 10	Evaluating Evidence for Nutrition Practice Recommendations: Fact vs. Fiction presentations		FF Presentation
11	Nov 17	Cultural Competency; Reaching low literacy populations	Chap. 16; CDC's *Simply Put: Creating easy to understand materials*	Discussion, CS Interview, CC Material, Paper, Presentation
12	Nov 24	Counseling for Dietetic Professionals (online)	Articles re: *Nutrition Counseling Skills*	Discussion
13	Dec 1	Community Nutrition & Health Promotion Research Projects; In-class Project Development time **CC Nutr Ed Assignment Due**		Discussion
14	Dec 8	GROUP PROJECT PRESENTATIONS		Presentation
15	Dec 15	FINAL PAPER DUE BY 5:30 PM		Paper

FS=Food Stamp, CS=Community Stakeholder, CC=Cultural Competency

Last Updated 11/8/16

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 72200 Food Politics and Policy
3 Credits
Fall 2015

Time and location	Thursdays 6:05 PM – 7:50 PM and online Silberman 216 and online August 27, 2015 – December 23, 2015
Instructor	Nevin Cohen, Ph.D. Associate Professor, CUNY School of Public Health 55 West 125th Street, room 811 New York, NY 10027 212-646-8340 (T) 917-721-8037 (M) nevin.cohen@sph.cuny.edu (preferred contact)
Office hours	Wednesdays 3:00 to 6:00 or by appointment
Course website	https://canvas.instructure.com/courses/957342
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This policy course examines the influence of the food industry and government on the U.S. food system and the way we eat, and on efforts to prevent and treat chronic diet-related conditions, such as obesity.
Course prerequisites	30 completed credits + advisor + instructor permission
Course format	This is a hybrid course that meets in person 5 times during the semester; the remainder of the time the course is conducted online asynchronously through Canvas.
Required reading and resources	All readings listed in the course schedule will be available in PDF format on the course website. You may wish to have your own copy of the following texts, but that is optional: Neff, Roni, ed. *Introduction to the US Food System: Public Health, Environment, and Equity*. John Wiley & Sons, 2014. Wilde, Parke. *Food policy in the United States: An introduction*. Routledge, 2013.
Suggested reading and resources	A list of additional readings and resources will be posted to the course website.

Last Updated 11/8/16

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
Apply research methodology, interpretation of research literature and integration of research principles into evidence-based practice for public health nutrition	- Conduct research on food policy - Critically discuss the food policy literature - Analyze a food policy and write a policy brief offering evidence-based recommendations	-Discussion forum -Reading reflections -Policy briefs
Use social and behavioral theories to inform public health and nutrition research and practice.	-Analyze food policies through social and behavioral frameworks -Identify opportunities for policy interventions to influence nutrition and diet-related chronic diseases	-Discussion forum -Policy briefs
Discuss the role of government and organizational systems and policies that influence accessibility, adequacy and safety of the food supply system (production, processing, distribution, consumption), and the relationship of food, nutrition and lifestyle choices in health promotion and disease prevention	-Understand the effects of federal, state, and local policies on the food system, including the availability of healthy food -Assess the effects of policies on dietary choices, food practices, and health outcomes	-Discussion forum -Reading reflections -Policy briefs
Demonstrate effective oral and written communication and advocacy skills for public health nutrition	-Write a concise and compelling argument assessing a policy proposal and recommending a course of action - Present arguments in a concise narrated presentation.	-Policy briefs

Last Updated 11/8/16

Course Assessments

Discussion Fora: We will engage in two online discussions each week, beginning the second week of class. One will involve debating a current policy controversy addressed in the week's readings. The second will involve identifying and discussing policy innovations to address the week's topic. You will be expected to contribute information, insights, evidence-based argumentation, and reflect and respond to the ideas expressed by others. I will evaluate your contributions based on how well you integrate the readings and other published material into your comments, the logic of your arguments, how adequately you back up statements with evidence, and writing quality.

In-class Discussions: Since we meet in person only five times during the semester it is essential for you to attend these classes. Our in-class discussions will follow the same format as our online discussions, but because the conversations are in real time you must be prepared in real time to address the readings scheduled for that week. You will be evaluated on the quality of your engagement with colleagues.

Policy Briefs: You will prepare two 5-page policy briefs addressing a current food policy issue that affects the urban food environment. These can be evaluations of proposed policies, recommendations for new policies, or an analysis that sheds new light on existing policies and programs. These will be evaluated based on the quality of the evidence used to support your argument(s), the logic of the arguments, the analysis you provide, and the quality of the writing (including grammar, proper citations, etc.)

Grading

Evaluation criteria

Students who perform exceptionally in all aspects of the course will receive an "A." A grade of "B" will reflect adequate work. Any grade below a "B" will indicate that you should be performing better. All assignments must meet professional standards of analysis, presentation, and timeliness. Accurate spelling and grammar, and clear and concise writing, are critical. Assignments *will not be accepted after they are due* unless you have a compelling reason for being late (e.g., medical or family emergencies) and I agree to an alternative due date.

Evaluation criteria for written assignments:

A	The assignment is well-written, accurate, original, relevant, and teaches us something new. It adds substantial learning presence to the course and stimulates additional thought about the issue under discussion.
B	The assignment lacks at least one of the required qualities, but is generally above average in quality. It makes significant contribution to our understanding of the issue being discussed.
C	The assignment lacks two or more of the required qualities listed above. Comments are based on unsubstantiated personal opinion.
D	The assignment presents little or no new information.
F	The assignment adds no value to the discussion and lacks many of the required qualities.

The relative weight of each course component is:

	Weight
Discussion Forum – Policy Debate	20%
Discussion Forum – Policy Innovation	20%
In-class discussions	10%
Policy Brief #1	25%
Policy Brief #2	25%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

You are required to attend every class that meets in person and to participate in every online discussion session. This is particularly important as we meet only once per week. As noted above, I expect active participation in both in-person and online discussions.

Late/incomplete submission of assignments

Late or incomplete assignments will not be accepted unless you are ill or have a family emergency. If you know you will not be able to meet a deadline contact me as soon as possible to discuss an alternate deadline.

Make-ups, rewrites, and extra credit

There are no make-ups for the online discussions. You will have an opportunity to re-write the two policy briefs based on my comments, and I will count only the final grade. There are no extra credit assignments.

Expectations of students

One of the biggest obstacles to successful learning is not allocating sufficient time to coursework. I realize that many of you are juggling multiple responsibilities, but I expect you to devote the effort required to read assigned material and learn the course content and to put effort into the online discussions and the policy briefs. I also expect you to be the consummate professionals that you are – showing respect and treating each other collegially in both in-person and online interactions. In your discussions with me, please be open and communicative – please tell me if the course is not meeting your expectations early on so that I can make adjustments. Whatever you do, please let me know if you are having trouble with any aspect of the course. Other expectations include the following:

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and the academic calendar.
- Know how to use library resources and citation tools.
- Come to class and to the Canvas site fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date unless due to a medical or family emergency.
- No credit for assignments suspected of plagiarism. (and see the Academic Integrity section below for the additional consequences of plagiarism)
- Regularly check the course website and official university email for course correspondence. The readings and schedule are likely to change, and it is your responsibility to keep track of the schedule.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted on the discussion board.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

My goal is to make this course a valuable learning experience that is intellectually interesting and challenging and relevant to your professional and academic work. You can expect me to be prepared each week, to make myself as accessible as possible, to return your work promptly (usually within one week) with comments and suggestions, and to treat each of you with respect and collegiality. I have high expectations and strict standards, but I also try to be very reasonable if you express concerns or problems to me as they arise (and not at the end of the term). Specifically, I will try to:

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours Monday through Friday.
- Communicate about grades and progress in the course through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Last Updated 11/8/16

Course Schedule

This schedule is likely to change as the semester progresses. Please check the course website for updates, and ask if you are unsure about scheduled topics/readings or assignments. Also refer to the current academic calendar for important university-wide dates.

Session	Date	Topic	Readings/Resources	Assessment
I. Introduction to Food Politics and Policy				
1	8/27/15 In Person	Course Overview: The problems with our food system are well-known: food insecurity, ubiquity of unhealthy food, occupational hazards in the food industry, environmental damage, etc. This course explores the reasons why the food system has evolved the way it has, and the potential for public policy – at both the national and local levels -- to re-shape it to improve health, social justice and ecological well-being. In this first class we will introduce ourselves, review our expectations for the course, go over logistics, including the features of the online learning platform, and then discuss what we mean by a food *system*, and how looking at food as a system helps us to understand its multidimensionality and interconnectedness, which will lead to better policymaking.	Neff, Chapter 1 – Food systems -This introductory chapter of Neff's edited volume briefly discusses systems thinking and the elements of the food system. It also discusses the concept of "wicked problems," a framework very helpful in thinking about many different public health problems. Shannon KL, Kim BF, McKenzie SE, Lawrence RS. Food System Policy, Public Health, and Human Rights in the United States. *Annu Rev Public Health*. 2015;36(1):151-173. -This review article explains how policies structure the food system, and the consequences for health, a topic that we'll address in more depth throughout the semester.	-In-class discussions
2	9/3/15 In Person	Drivers of the food system - economics, policies, lobbyists, marketing: In this session we'll examine the different forces that shape food policies and thus the food system.	Neff, Chapters 7, 8, 10 -These chapters provide an overview of basic economic concepts that are important for understanding food policy; food policy development; and the role of marketing in both food economics and policy – as well as individual behavior. Wilde, Chapter 1 - This chapter reviews basic civics as it applies to food and also discusses the	-Discussion fora

			role of interest groups in shaping food policy Nestle, Chapter 4 -Nestle explains in more detail the role of industry lobbyists in shaping food policies. Moreland, Chapter 2 - This chapter by Professor Spark provides an overview of federal food policy and the structure of the food industry	
3	9/17/15 Online	Urban food policy: Many food advocates have argued that local governments may be better able to intervene in the food system through local policies and innovative programs. This class reviews why there has been a turn to the local and what local governments can do to affect a global socio-technical system like food.	- Morgan K. Nourishing the city: The rise of the urban food question in the Global North. Urban Stud. 2014. Kevin Morgan explains why food has become an urban issue and how cities have begun to address the consequences of the dominant food system. - Cohen N. Urban food systems strategies. Elgar Companion To Sustain Cities Strateg Methods Outlook . 2014:57-85. In this chapter I outline a number of ways in which cities in the US have begun to re-shape the food system through policies. - Libman K, Freudenberg N, Sanders D, Puoane T, Tsolekile L. The role of urban food policy in preventing diet-related non-communicable diseases in Cape Town and New York. Public Health. 2015;129(4):327-335. Kim Libman and colleagues discuss urban policies specifically addressing diet-related diseases. - Freudenberg N, Atkinson S. Getting food policy on the Mayoral table: a comparison of two election cycles in New York and London. *Public Health*. 2015;129(4):295-302. The question of the salience of food policy at the local level is critical. This article discusses how food gets on the political agenda. -Reeve B, Ashe M, Farias R, Gostin L. State and Municipal Innovations in Obesity Policy: Why Localities Remain a Necessary Laboratory for Innovation. *Am J Public Health*. 2015;105(3):442-450. One argument for focusing on urban policies is that cities are more nimble	-Discussion fora

			scales in which to develop, test, and improve food policies, as this article discusses.	
II. Reducing Food Insecurity				
4	9/24/15 Online	Federal food assistance programs: In the next several sessions we tackle the complex, interrelated issues of food insecurity, malnourishment, and poverty, and the various policies aimed at improving access to healthy food and improving nutrition and health.	- Neff, chapters 5 & 6 These chapters discuss ways to measure food insecurity and community food security, and various policies to make people and communities more food secure. - Pringle, chapter 6 This chapter provides a brief overview of the history of food stamps/SNAP and WIC. Read it before the Aussenberg report. - Aussenberg, RA & Colello, KJ. Domestic Food Assistance: Summary of Programs. Congressional Research Service. 2/4/15. This report summarizes the federal food assistance programs - Mercier S. Review of U. S. Nutrition Assistance Policy : Programs and Issues. 2012;(June) The Mercier report also reviews federal food assistance policies and programs, providing more detail and evidence of their effects. You can skim this report and refer back to it as a reference. - Fricke HE, Hughes a. G, Schober DJ, et al. An Examination of Organizational and Statewide Needs to Increase Supplemental Nutrition Assistance Program (SNAP) Participation. *J Hunger Environ Nutr*. 2015;10(2):271-283. - Dimitri C, Oberholtzer L, Nischan M. Reducing the Geographic and Financial Barriers to Food Access: Perceived Benefits of Farmers' Markets and Monetary Incentives. *J Hunger Environ Nutr*. 2013;8(4):429-444. These final two articles discuss local policy responses to the SNAP program – increasing participation in the program and increasing the use of SNAP for fresh fruits and vegetables sold through farmers markets.	-Discussion fora
5	10/1/15 In Person	School food and nutrition programs for children: School food is critical because it provides a large portion of the daily calories of many children, and the school food program is a	- Poppendieck, J. 2010. Free For All: Fixing School Food in America. Berkeley: UC Press. Chapters 2&3, pgs 46-110. Professor Poppendieck's chapters discuss the genesis and evolution of the school food program	-Discussion fora

		huge public food procurement program that can potentially be used to support regional food producers, change production methods, and improve public health.	- Wilde, Chapter 11 Wilde's chapter also discusses the Women Infants and Children (WIC) program. - Aussenberg, A. School Meals Programs and other USDA Child Nutrition Programs: A Primer. 2014. Congressional Research Service. Skim this and use it as a reference. Dinour LM. Conflict and Compromise in Public Health Policy: Analysis of Changes Made to Five Competitive Food Legislative Proposals Prior to Adoption. *Heal Educ Behav*. 2015;42(1 Suppl):76S - 86S. This article discusses the policy processes involved in addressing so-called competitive foods – vending machine snacks and other food sold during the school day. It's useful in understanding the kinds of political forces that move policy initiatives forward and inhibit them.	
6	10/8/15 Online	Improving the built food environment Policy Brief 1 Due	- Neff, Chapters 13, 14, and 17 These chapters explain how the food processing and distribution industries evolved to the concentrated, centralized system that we have today, and how this system affects local food environments. - Stanton R a. Food Retailers and Obesity. *Curr Obes Rep*. 2015;4:54-59. doi:10.1007/s13679-014-0137-4. The Stanton article explains how the economics and design of the modern supermarket contributes to obesity. - Lehmann et al. State-Level Interventions: Pennsylvania's Fresh Food Financing Initiative. In Morland Ch. 9 This chapter discusses an increasingly common policy approach to improve food access in low-income communities: financing and other incentives to get supermarket chains to open. - Libman K. Has New York City fallen into the local trap? *Public Health*. 2015;129(4):310-317. Libman's article questions whether a focus on local food environments detracts from a potentially more important focus on citywide interventions that would improve the food environment more broadly. - Elbel B, Moran A, Dixon LB, et al. Assessment of a government-subsidized	-Discussion fora -Policy Brief

			supermarket in a high-need area on household food availability and children's dietary intakes. *Public Health Nutr*. 2015:1-10. Elbel's recent study in the South Bronx calls into question the effectiveness of supermarket incentive programs in low-income communities. -Leib EM. All (Food) Politics is Local : Increasing Food Access through Local Government Action. *Harvard Law Policy Rev*. 2013;7:321. Leib's article summarizes a wide range of local policy interventions to improve food access. -Sacks R, Yi SS, Nonas C. Increasing Access to Fruits and Vegetables: Perspectives From the New York City Experience. *Am J Public Health*. 2015:e1-e9. This article reviews numerous NYC policies to increase access to fresh fruits and vegetables.	
III. Improving Nutrition and Food Quality				
7	10/15/15 Online	Obesity: One of the most politically salient food system issues over the past decade has been obesity and resulting NCDs. Many policies already examined in the course are designed to reduce obesity, but in this class we'll dive more deeply into how obesity has been defined, its role in shaping policy, and specific policy efforts to address it.	-Sisnowski J, Handsley E, Street JM. Regulatory approaches to obesity prevention: A systematic overview of current laws addressing diet-related risk factors in the European Union and the United States. *Health Policy (New York)*. 2015;119(6):720-731. This article discusses who is targeted for policy interventions and what categories of policies are used in the EU and US to reduce obesity. Bowen DJ, Barrington WE, Beresford S a. a. Identifying the Effects of Environmental and Policy Change Interventions on Healthy Eating. *Annu Rev Public Health*. 2015;36(1):289-306. doi:10.1146/annurev-publhealth-032013-182516. -Kersh R, Elbel B. PUBLIC POLICY & OBESITY: OVERVIEW AND UPDATE. *Wake For J Law Policy*. 2015;5:105-123. Kersh and Elbel discuss different types of policies that operate through different behavioral mechanisms at different scales to address obesity. -Berg, Chapter 5 Berg's chapter focuses on anti-obesity policies and politics during the Bloomberg administration in NYC.	-Discussion fora

8	10/22/15 Online	Dietary guidelines and nutritional standards	-Wilde Chapters 8 & 9 These chapters discuss the evolution of federal dietary guidelines and the regulation (or non-regulation) of nutritional labeling and nutritional claims. - Nestle Chapters 1-3 This section from Nestle's book explores the politics of dietary advice in the US. -Lederer A, Curtis CJ, Silver LD, Angell SY. Toward a healthier city: nutrition standards for New York City government. *Am J Prev Med*. 2014;46(4):423-428. -Tsui EK, Wurwarg J, Poppendieck J, Deutsch J, Freudenberg N. Institutional food as a lever for improving health in cities: the case of New York City. *Public Health*. 2015;129(4):303-309. These two articles discuss how NYC has used nutritional standards for the food it serves or controls to improve public health.	-Discussion fora
9	10/29/15 In Person	Food and beverage marketing and calorie labeling:	-Neff, Chapter 10 This chapter provides an overview of food and beverage marketing -Cheyne A, Mejia P, Nixon L, Dorfman L. Food and Beverage Marketing to Youth. *Curr Obes Rep*. 2014;3:440-450. This article specifically addresses food marketing to youth, particularly in communities of color. -Gregory, Christian A., Ilya Rahkovsky, and Tobenna D. Anekwe. *Consumers' Use of Nutrition Information When Eating Out,* EIB-127, U.S. Department of Agriculture, Economic Research Service, June 2014. -Rendell SL, Swencionis C. Point-of-Purchase Calorie Labeling Has Little Influence on Calories Ordered Regardless of Body Mass Index. *Curr Obes Rep*. 2014;3:368-375. The USDA report and the subsequent article discuss one type of informational regulation - the use of calorie labeling - to encourage consumers to reduce their calorie consumption.	-Discussion fora
10	11/5/15 Online	Food Safety: Food illnesses are a significant public health problem. This session reviews the food safety regulatory system and recent changes to make it more effective.	CRS – Primer and guidance for 114th congress	-Discussion fora

IV. Supporting Healthy Food Systems				
11	11/12/15 Online	Sustainable and Resilient Diets: The public health field has recently begun to focus on the relationship between our diets and global sustainability. The nexus between food and climate change, the water consumption of food production, and food waste have become particularly salient issues. This session discusses the notion of a sustainable diet, and how food policies might foster ecological sustainability.	-Neff Chapter 3 This chapter provides an overview of the relationship between food systems and the environment. -Scientific Report of the 2015 Dietary Guidelines Advisory Committee Part D. Chapter 5: Food Sustainability and Safety This year, for the first time, the US Dietary Guidelines were informed by an analysis of sustainability, as this chapter in the scientific report supporting the dietary guidelines discusses. -Berry EM, Dernini S, Burlingame B, Meybeck a, Conforti P. Food security and sustainability: can one exist without the other? *Public Heal Nutr*. 2015;(5):1-10. -Drewnowski A. Healthy diets for a healthy planet. *Am J Clin Nutr*. 2014;99(353410):1284-1285. -Lang T, Barling D. Nutrition and sustainability: an emerging food policy discourse. *Proc Nutr Soc*. 2013;72(1):1-12. These articles discuss the importance and value of integrating sustainability into our dietary policies and into the field of nutrition.	-Discussion fora
12	11/19/15 Online	Organic, local, healthy: Consumers tend to conflate these concepts, and in this class we will tease them out and learn whether, how and to what extent organic production methods or localized food systems contribute to (or detract from) environmental or occupational health, sound nutrition, and food security.	- Obach, Brian K. Organic Struggle: The Movement for Sustainable Agriculture in the United States. MIT Press, 2015. Chapters 3, 4, 5, 8 Obach's book discusses the history of the organic food movement and the creation of federal organic standards, an important context for discussing the role of organic food in health and sustainability. -Werkheiser I, Noll S. From Food Justice to a Tool of the Status Quo: Three Sub-movements Within Local Food. *J Agric Environ Ethics*. 2013. - Cleveland D a., Carruth A, Mazaroli DN. Operationalizing local food: goals, actions, and indicators for alternative food systems. *Agric Human Values*. 2014;32(2):281-297. - Born B, Purcell M. Avoiding the Local Trap: Scale and Food Systems in Planning Research. *J Plan Educ Res*. 2006;26(2):195-207. -Sonnino R. Escaping the Local Trap: Insights on Re-localization from School	-Discussion fora

			Food Reform. *J Environ Policy Plan*. 2010;12(1):23-40. These articles provide different perspectives on local food: the politics of local; the goals of local food systems; the trap we fall into when we embrace local; and the potential benefits of localizing food purchases.	
13	12/3/15 In Person	Guest Lecture TBA Policy Brief 2 Due	!	-Discussion fora -Policy Brief
14	12/10/15	Labor in the Food System: Food workers, from farm laborers to fast food restaurant staff to grocery deliverymen, face occupational hazards, low pay, exploitation, and limited potential for advancement. This final seminar session addresses the relationship between food labor and the current food system, the health risks to food workers, and opportunities to organize food laborers for better conditions.	- Myers JS, Sbicca J. Bridging good food and good jobs: From secession to confrontation within alternative food movement politics. *Geoforum*. This articles looks at the potential for alternative food movements to address labor issues. - Minkler M, Salvatore AL, Chang C, et al. Wage theft as a neglected public health problem: an overview and case study from San Francisco's Chinatown District. *Am J Public Health*. 2014;104(6):1010-1020. This article frame wage theft (and poverty wages) as a public health problem for food workers. -Bradie, Marnie. An Appetite for Justice: The Restaurant Opportunities Center of New York. In Milkman, R and Ott, E. New Labor in New York: Precarious Workers and the Future of the Labor Movement. This chapter describes ROC-NY, a new form of labor organization that has been organizing food workers for better wages and working conditions.	-Discussion fora
15	12/17/15	Course wrap-up		

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 73700: Supervised Fieldwork in Public Health
3 Credits
Fall 2015

Time and location	Mondays 8:00pm-9:45pm // Silberman, room 201 See **Schedule** below for details.	
Instructors	**Contact info**	**Office hours and location**
Janice Chisholm (HPM)	jc2898@columbia.edu	By appointment
Jennifer Brite (EPI/BIOS)	jenbrite@gmail.com	By appointment
Daliah Heller (COMHE)	daliah.heller@sph.cuny.edu	By appointment 55 West 125th St, rm 808
Brian Pavilonis (EOHS)	bp305@hunter.cuny.edu	By appointment Silberman, rm 721
Arlene Spark (NUTR)	aspark@hunter.cuny.edu	By appointment Silberman, rm 609
Course website	https://bbhosted.cuny.edu	
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.	
Course description	Students carry out 180 hours of supervised field work that is intended to bridge academic preparation and public health practice. Knowledge and skills from the core MPH and specialization courses are applied in a public health agency, community organization or other setting relevant to the student's academic background, specialization and career expectations. This is accomplished under the supervision and guidance of an experienced preceptor. Field-	

	based hours are implemented with classroom and individual meetings along with online communication. Aside from deliverables required by the preceptor, the student develops a reflection paper, a self-evaluation and a capstone proposal.
Course prerequisites	Completion of 18 credits toward the master's degree, including at least 3 required core courses (biostatistics, epidemiology, and the course most relevant to your specialization) and at least 2 courses in student's specialization.
Course format	The course is provided in a hybrid format – didactic sessions are provided online, including confirmatory participation quizzes, and face-to-face sessions are held for group meetings with faculty advisors and peers. Please see Schedule below for details.
Required reading and resources	NA
Suggested reading and resources	**BOOK** • Brownson RC, Baker EA, Leet TL, Gillespie KN, True WR. Evidence-Based Public Health, 2nd edition, Oxford University Press, 2011. **ARTICLES** **(Sessions 1, 2)** • Baker, E.L., Jr. et al, *The Public Health Infrastructure and Our Nation's Health. Annual Review of Public Health*, 2005. **26**:p. 303-318. • Mays, Glen P. et al, *Public Health Delivery Systems-Evidence, Uncertainty, and Emerging Research Needs*. American Journal of Preventive Medicine, 2009. **36**(3), p. 256-265. • Mays, Glen P, D. Scutchfield, M.W. Bhandari, and S.A. Smith, *Understanding the Organization of Public Health Delivery Systems: An Empirical Typology*. The Milbank Quarterly, March 2010. **88**(1): p. 81-111. **(Sessions 3-5)** • Callahan, D. and B. Jennings, *Ethics and Public Health: Forging a strong relationship.* American Journal of Public health, 2002. **92**(2): p. 169-176. • Brownson, R.C., J.E. Fielding, and C.M. Maylahn, *Evidence-Based Public Health: A Fundamental Concept for Public Health Practice.* Annual Review of Public Health, 2009. **30**(1): p. 175-201.

	• Rychetnik, L., et al., *Criteria for evaluating evidence on public health interventions.* Journal of Epidemiology and Community Health, 2002. **56**(2): p. 119-127. **RESOURCES** **(Sessions 1-3, 6)** • **Searching the literature and managing references** http://libguides.library.hunter.cuny.edu/ph755/databases • **Writing a literature review** http://www.sportsci.org/jour/9901/wghreview.html **(Sessions 7, 8)** • **Writing a research paper** http://intqhc.oxfordjournals.org/content/16/3/191.full/ http://intqhc.oxfordjournals.org/content/16/3/191/T1.expansion.html http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html • **Resume tips** http://www.sph.unc.edu/student_affairs/revamp_your_resume_and_cv_3312_4585.html • **Interviewing tips** http://www.boston.com/jobs/bighelp2008/fall/common_interview_mistakes/?s_campaign=8315

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Demonstrate (e.g. through the portfolio) the application of assessment, assurance and/or policy development during the fieldwork experience.	• Identify and assemble in the e-portfolio the product(s) of fieldwork project that exemplify the application of core public health functions in your work
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Demonstrate through self-reflection activities the application of one or more core public health values or techniques through the fieldwork experience	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Adhere to ethical and social justice principles and standards	• Apply ethical principles to fieldwork placement, (e.g. human subjects' protection principles to the data collection). • Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards	• Establish an approved protocol through CUNY IRB for human subjects' protection in your fieldwork project • Complete and submit the Student's Evaluation of Fieldwork Project Form
Interpret and analyze public health literature and apply evidence-based research	• Explore and become familiar with the public health literature databases and resources for organizing citations and sources	• Submit a rapid literature scan on your fieldwork topic

		• Submit a working bibliography on your fieldwork topic • Submit a literature review on your Capstone research question
Apply basic statistical and informatics techniques	• Review and identify appropriate quantitative methods and tools for measuring public health data	• OPTIONAL (Quantitative Studies Only). In your Capstone Proposal, describe the method(s) you've selected for measuring your data from the fieldwork project
Communicate public health information through oral, written, digital and visual presentation	• Prepare written and oral progress and evaluation reports (e.g. the fieldwork project), using appropriate professional formats.	• Submit via electronic forms two progress reports on the fieldwork placement project • Complete and submit the Student's Evaluation of Fieldwork Project Form
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Discuss the relationship between social, behavioral, biomedical, and environmental elements and health outcomes	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Design and evaluate interventions to prevent or control public health problems	• Develop and assess policies and activities that are responsive to public health problems	•

Collect, analyze and interpret public health data	• Apply data collection, analysis, and interpretation methods to public health data	• OPTIONAL (Quantitative Studies Only). In your Capstone Proposal, describe the method(s) you've selected for measuring your data from the fieldwork project
Engage and collaborate with diverse groups	• Identify different stakeholders and evaluate their roles on the fieldwork project.	• Complete and submit the Student's Evaluation of Fieldwork Project Form
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Discuss the legal aspects of the US public health system and its inter-sectoral relationships with other public systems.	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project	• Complete and submit a Gantt chart describing the timeline for the fieldwork project • Design and submit a logic model describing the process for the research conducted via the fieldwork project
Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Discuss how the agencies you worked with during your fieldwork experience deliver health-related services to the populations they serve.	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice

Course Assessments

The Supervised Fieldwork course is designed to guide students through the development, implementation, and completion of a research project on some aspect of public health practice at an approved placement site. Course assignments reflect the progressive activities involved in conducting the project, including design, planning and management, and implementation. This course process is intended to support the student's progress in the fieldwork project and to generate the elements of a resulting Capstone proposal or template paper for the student's culminating experience in the degree program. During the fieldwork period, students are expected to complete and submit two progress reports, and a final "reflections" paper on the experience. Both students and preceptors are required to complete evaluations of the fieldwork project upon its completion.

Grading

Evaluation criteria

Assignments and their relative weight toward your final grade in the course are listed below. The evaluation rubric which will be used to establish the grade for each assignment is available on the course Blackboard website under the section entitled My Assignments, along with instructions for that assignment. Items prefaced with an asterisk (*) will not have an evaluation rubric, and will be graded simply as complete (full points) or missing/incomplete (no points).

The relative weight of each course component is as follows:

Assessment	Weight
Rapid literature scan	10%
Working bibliography	5%
*IRB determination	5%
*Progress report #1	5%
Gantt chart	5%
Logic model	5%
*Progress report #2	5%
Literature review	15%
"Reflections" paper on fieldwork project	15%
Capstone proposal	20%
Class participation	10%
*Student Evaluation of Fieldwork Project Form	%
*Preceptor Evaluation of Fieldwork Project Form	%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

The final course grade will be determined using the performance assessment described above, and resulting in a Pass (70% or higher) or a Fail (less than 70%) grade.

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

While the program discourages students from taking Incompletes, under some circumstances, an Incomplete may be the only option for completing the Fieldwork Project.

A request for an Incomplete must be approved by the Faculty Advisor, and the incomplete grade must be resolved within the next two semesters.

Students with an Incomplete in this course, Fieldwork (PH 73700), are not eligible for enrollment into the Capstone course (PH 73800) until the Incomplete is resolved.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Because this is a hybrid course, students are expected to participate both online and in face-to-face meetings in class. Online participation is limited to two didactic sessions, and will be assessed with mini-quizzes to be completed at the end of each module in the session. Face-to-face participation will be assessed by faculty-administered attendance at the six class meetings.

Late/incomplete submission of assignments

Late assignments will not be accepted except in extenuating circumstances, with written approval by the student's faculty advisor. Incomplete assignments will be graded as such, unless the student is granted the opportunity to submit a rewrite by the faculty advisor, with written approval.

Make-ups, rewrites, and extra credit

Make-ups and extra credit assignments are not available for this course. In extenuating circumstances, the faculty advisor may allow a rewrite (or resubmission) of an Incomplete assignment, and must agree to this arrangement with written approval.

Expectations of students

Students are expected to submit Assignments on time, to participate respectfully in class and on the course Blackboard website, and to communicate with their Faculty Advisor on progress and problems related to the Fieldwork Project, as soon as issues arise.

Expectations for the instructor

Faculty Advisors will grade Assignments and post results within seven days of submission. Faculty Advisors will respond to all emails from students within 72 hours of receipt, and will arrange face-to-face meetings with students as requested, and with Preceptors, as necessary.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

This course schedule is subject to change.

For important dates, please refer to the current academic calendar.

Session # Mode Date	Topic	Assignment (Please submit all Assignments to your Faculty Advisor via email and via the Assignments section on the course Blackboard site.)
Session 1. **Face-to-face** August 31	Welcome and overview, Fieldwork connection to Capstone • Searching the literature: Initial Lit Scan • Developing a research question • IRB preparation and submission	By 8/31 • A fieldwork contract (Please bring your contract to class)
Session 2. **Face-to-face** September 10	Library session • Search tools • Reference management tools	**Meet in C Level at Silberman Room TBD**
Session 3. **Face-to-face** October 5	Meet in track-specific groups in class • Discuss research question and literature review development	By 10/4 • An IRB determination form (Please bring your completed form to class) • A brief literature scan • First midterm fieldwork status assessment survey

Session # Mode Date	Topic	Assignment (Please submit all Assignments to your Faculty Advisor via email and via the Assignments section on the course Blackboard site.)
Session 4. **Online** October 19 – October 25	• Project Management using Gantt Charts • Logic Models • Charts, Graphs and Figures for Projects	
Session 5. **Face-to-face** October 26	Meet in mixed (non-track-specific) groups in class • Discuss project management planning, processes, and implementation	By 10/25 • A project plan using a Gantt chart or similar timeline model • Project logic model (Please bring both documents to class)
Session 6. **Online** November 9 – November 15	Complete two out of three sections, most relevant to your Fieldwork Project - 1. Complete one of a) Quantitative Analysis – planning and preparation: data analysis and mini stats review b) Qualitative Studies – planning and analysis *2.* Capstone paper – planning and development	By 11/9 • Second midterm fieldwork status assessment survey • Preliminary working bibliography • Literature review
Session 7. **Face-to-face** November 16	Meet in track-specific groups in class • Peer review and discuss each other's Capstone paper proposals	By 11/15 • First draft of Capstone proposal (Please bring your first draft to class)

Session # Mode Date	**Topic**	**Assignment** **(Please submit all Assignments to your Faculty Advisor <u>via email and via the Assignments section on the course Blackboard site</u>.)**
Session 8. **Face-to-face** December 14	All-class meeting to review Fieldwork to Capstone requirements • Track-specific group meetings to finalize Fieldwork to Capstone processes	By 12/13 • A completed **Student's Evaluation of Fieldwork Experience Form** • A completed **Field Placement Supervisor's Evaluation Form (emailed from Placement Supervisor to Fieldwork faculty)** • A 'Reflections' document on Fieldwork for Student Portfolio • Capstone Proposal • Working bibliography
Optional. **Individual consultations** December 15-21	Student Faculty Consultations	**Note: Students should verify that all Assignments have been delivered or scheduled for delivery with Fieldwork faculty.**

CUNY SCHOOL OF PUBLIC HEALTH

HUNTER COLLEGE

COURSE SYLLABUS
PH 73800: Capstone
Fall 2015

Time & Location Mondays 6:05 – 7:50pm Silberman Auditorium (Rm 201)

Instructors	Email Addresses	Office Hours & Location
Janice Chisholm (HPM)	jc2898@columbia.edu	By appointment
Jennifer Brite, MPH (EPI/BIOS)	jenbrite@gmail.com	By appointment
Karyn Faber, EdD, MPH (COMHE)	kf206@hunter.cuny.edu	By appointment
Brian Pavilonis, PhD (EOHS)	bp305@hunter.cuny.edu	Monday and Wednesday 4:00PM – 6:00 PM Silberman, room 721
Arlene Spark, EdD, RD, FADA, FACN (NUTR)	aspark@hunter.cuny.edu	Mondays 4-5:30 PM and by appointment, Silberman, room 609

Course Bb site

Accessed via https://bbhosted.cuny.edu. User name and password are required.

Support resources

For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.

Course description

This course consists of a structured seminar aimed at allowing students to apply experiences gained during their graduate program and synthesize that knowledge and experience in the form of a major writing project. It is expected that students use a combination of synthesized evidence, theoretical models, and empirical research to answer a public health research question or practice problem using interdisciplinary perspectives.

Course prerequisites

Completion of at least 36 credits of coursework toward the Master of Public Health (MPH) or Master of Science degree, including at least one course in each of the 5 core areas of public health (biostatistics, epidemiology, social and behavioral sciences, public health policy and environmental health and safety); and at least 3 specialization courses.

Course format

This course is taught with a mix of online learning resources and in-class discussion. This is not a self-paced course; there are weekly deadlines for writing, discussion and revisions, and attendance at and participation in the final presentations of all capstone projects.

This course is designed for students writing Capstone Papers and for those with permission to write Master's Essays. The schedule of assignments and deadlines vary depending on the type of project. Students writing the Capstone Paper attend every class; students writing the Masters Essay may attend all classes, but they must attend classes with an asterisk (*) in the Course Schedule below.

Required reading and resources

NA

Suggested reading and resources

See readings starting on page 12

Core Competencies *This course will help you to:*	**Course Learning Objectives** *After successfully completing this course, you are expected to be able to:*	**Assessment methods** *Competencies and learning objectives will be assessed as part of the following course assignments:*

Apply the public health core functions of assessment, policy development and assurance	• Construct a testable research question or practice problem, which
	  ○ can feasibly be addressed within a specified time period
	  ○ is of public health relevance
	  ○ when addressed will fill a knowledge gap
		Week 6

Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Place a research question or practice problem within a relevant conceptual framework and the broader public health context • Identify and apply relevant professional or scholarly methods to an investigation or practice problem, including use of a predefined protocol or research plan. • Plan the analysis, synthesis and write up of an investigation from inception to completion including scheduling of items on the critical path to completion	Weeks 6,8,11,14-15
Adhere to ethical and social justice principles and standards	• Analyze relevant ethical or social justice issues using widely recognized principles or standards. • Obtain IRB or IACCU approval or exemption if appropriate. • Conduct any public health investigations involving human subjects in accordance with OHRPP ethical performance standards, including maintenance of confidentiality and security.	Week 2
Interpret and analyze public health literature and apply evidence-based research	• Implement a structured search of the literature. • Summarize the literature to date, including quantitative associations and qualitative themes, on a specific topic taking into account levels of evidence	Weeks 6,8,11,14-15

	• Identify weaknesses within existing literature, such as addressing the wrong question, lack of comparison groups, biases or limited generalizability	
Apply basic statistical and informatics techniques	• Generate summarized descriptive information from PH data, such as frequencies and cross-tabulations • Assess qualitative data according to accepted methods, such as componential analysis. • Identify the key findings of a study or practice experience. • Provide sources of information for all statements of fact in the draft through use of a citation manager • Present PH information in figures, tables and graphs, such that each figure/table/graph is interpretable, self-explanatory and can be read standalone	Weeks 2, 3, 5, 8, 11, 14-15
Communicate public health information through oral, written, digital and visual presentation	• Identify the interests of different stakeholders in the findings • Make an oral or poster presentation conveying key findings to a defined audience contextualized within current knowledge and interests of stakeholders, as well as with due acknowledgement of strengths and weakness of findings. • Write a document a public health problem such as a research report, program evaluation, analytic paper or policy analysis, using language appropriate for a professional public health audience.	Weeks 11-15
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Identify and describe environmental, behavioral, interpersonal, social, economic, political or policy factors that affect the etiology, prevention or resolution of a selected public health problem	Weeks 11-15
Design and evaluate interventions to prevent or control public health problems	• Implement the analysis, synthesis and writing plan for the culminating writing experience according to a predefined plan • Discuss the implications of a study or evaluation to address the needs for future evaluation and research, or for the development and implementation of programs and policies.	Weeks 1-15
Collect, analyze and interpret public health data	• Synthesize findings within the context of existing knowledge with acknowledgement of the strengths, weaknesses of the findings and gaps in knowledge that remain, and the corresponding implications for interpretation • Identify issues with reliability and validity of findings and explain their likely implications. • Justify methods of measurement • Identify public health implications of an investigation	Weeks 3, 5, 8, 11-15
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions.	• Generate logic models, theory of change diagrams, and Gantt Charts to implement and plan public health programs • Demonstrate program effectiveness through quantitative and qualitative measures	Weeks 1, 2, 4, 7

Course Assessments

The major deliverables for the course are the (a) written capstone project and the (b) accompanying oral *or* poster presentation. The written and oral or poster presentation are evaluated by two and five faculty members, respectively. The rubrics for grading each component are available on the course Bb site.

Grading

Evaluation criteria
Grading rubrics for each course component will be available on Bb
The relative weight of each course component is as follows:

Course component	**Weight**
Capstone paper or master's essay, plus letter of response to reviewers	75%
Oral presentation of capstone paper or master's essay	15%
Portfolio (required in order to earn a grade for the course)	5%
Attendance, Bb posts and participation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	**Quality Points**	**Percentage**
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. If an incomplete grade is granted, the student negotiates and prepares a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact Professor Khursheed Navder, the Hunter Campus Director, in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
Attendance is taken seriously and we do take attendance.

Late/incomplete submission of assignments
This course runs on a very tight, inflexible schedule. Late or incomplete assignments are seriously discouraged. Once a capstone student gets behind, it will be extraordinarily difficult to catch up and finish on time.

Rewrites, and extra credit
Rewrites are essential in this course! In fact, rewrites are an integral part of every serious writing endeavor. Extra credit is not available in this course.

Capstone handbook
The latest edition of the Capstone handbook is available on our course Bb site and at:
http://www.cuny.edu/site/sph/hunter-college/campus-resources/capstone.html

Statistical and IRB assistance
Jennifer Brite is available for statistical advice and help with SPSS software. Contact her by email to make an appointment. IRB assistance is available from your capstone faculty member.

Portfolio
Every MPH- and EOHS MS-degree student is required to prepare and maintain a professional portfolio. The portfolio describes relevant public health experiences and achievements during the course of the studies leading to the master's degree. The portfolio is submitted toward the end of the Capstone course and uploaded onto the FORMSTACK website. Detailed instructions for completing the portfolio are posted to the course website and also appear in the Capstone Handbook. *Submission of an acceptable portfolio is required for completion of this course and is a graduation requirement*. To access the site for depositing the *portfolio,* click on http://www.formstack.com/forms/?1143594-R3iqXqGNXR/. Or go to CUNY SPH page → Documents → CUNY SPH students → Hunter → Forms →Student e-Portfolio.

Expectations of the capstone faculty
- Provide regular announcements, reminders, and suggestions on the course website
- Respond to student email within 24 hours Monday through Friday.
- Provide feedback on assignments within 1 week of the due date.

Expectations of capstone students

- Arrive on time for class sessions and individual appointments, submit deliverables on time, participate in discussions.
- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Show respect to everyone in the course.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact your Capstone track faculty directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Skills the Capstone Faculty Expects of Capstone Students

Be able to prepare the following

- Written work that is free of plagiarism.
- Article summary
- Structured abstract
- Testable hypothesis
- Reference list using RefWorks, MS Word 2013, or other electronic citation software
- Annotated bibliography
- Literature review
- Legislation testimony
- Policy brief (1 page)
- Editorial
- Research report
- Op-ed essay

Be able to do the following

- Critically analyze public health documents, including peer-reviewed articles, grey literature, books, newspaper and magazine articles, blogs, texts produced by for-profit organizations, etc.
- Present your views clearly to a range of audiences
- Present both sides of controversial issues
- Copy edit an essay, which involves correcting spelling, punctuation, and grammar. It also includes suggesting the appropriate use of headings and subheadings, and ensuring that the required citation style is used. The task of the copy editor is to make the written work clear, correct, concise, comprehensible, and consistent.
- Develop a testable hypothesis
- Interpret statistical analyses and explain findings in narrative form
- Calculate & interpret descriptive statistics
- Calculate & interpret rates and proportions
- Calculate & interpret chi square and t-tests
- Construct & interpret tables & graphs
- Analyze and present quantitative data

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

CUNY academic calendar

Please refer to the academic calendar for important dates, such as holidays and the deadlines for dropping and withdrawing from a course. http://www.cuny.edu/academics/calendars/fall-2015.html

Course schedule and assignments

This class is designed for all Capstone Projects, both students writing Capstone Papers and for students writing Master's Essays. The schedule of assignments and deadlines vary depending on the type of project. Please review the tables on the next pages that clearly indicate when items are due depending on whether you have approval to work on a Master's Essay or Capstone Paper. This schedule may change as the semester progresses. Refer to the current academic calendar for important dates. **Be aware that we meet on Mondays, except September 10th, which is a Thursday.**

A.Capstone students write and submit their papers section-by-section. The faculty member makes suggestions, and the students makes revisions that are suggested. Email assignment to your capstone faculty member. When indicated, also post the assignment on Bb. All assignments are due the day before our class sessions (by 11:59 PM Sunday). Capstone students are required to attend all class sessions.

#	Date	Topic	Assignment All submissions to your capstone faculty member are via email. When indicated, also *post* on the Bb Discussion Board. Readings in the References section are optional, but *strongly recommended*. ^Applies to all students, including those doing Master's Essays.
1	8/31*	• Faculty introductions (AS) • Course overview (AS) • Working Bibliography/Template Paper (JC) • Outline, key sections of a paper (JC) • Creating an outline using Word – building your paper (JC) • Oral presentation or poster? (JC) • Gantt Chart Update (JC) • IRB Review (JB) • Portfolio assignment (AS)	Email & post: • ^Provisional **title** of capstone paper • Revised capstone **proposal** (from Fieldwork) • Working bibliography with ≥20 references with full abstracts (using citation software) and annotations of 10 selected papers for use in capstone paper Review: • 'The capstone paper as a whole' in the References section • MPH and MS portfolios in the References section of this syllabus and the Capstone Handbook Reading: 1-3, 5G
2	Thurs 9/10	• Methods – Procedures-Project (BP) • Methods – Qualitative Papers (KF) • Mini Stats Review and Data Analysis (JB) • Table Shells (planning results) (JB) *Sign-up for 1st individual student-faculty meeting*	Email: IRB determination, exemption, or approval (from Fieldwork) Email & post: • **Template paper** (with explanation for how the article will help you write your capstone paper. • **Outline** of your capstone paper (1-2 pp) using Word template • **Revised Gantt Chart** Reading: 5C [Week #1 assignment returned to you]
3	Week of 9/21	Meeting #1 w/capstone faculty member	Email & post: • **Methods** or **Process** section (1st draft) • **Tables, graphs**, and **figures** (1st drafts) [Weeks #1 & 2 assignment returned and discussed]

#	Date	Topic	Assignment All submissions to your capstone faculty member are via email. When indicated, also *post* on the Bb Discussion Board. Readings in the References section are optional, but *strongly recommended*. ^Applies to all students, including those doing Master's Essays.
4	9/28	• Results for Quantitative Analysis (JB) • Results for Qualitative Analysis (KF) • Results for Project Papers (BP)	Reading: 5D [Week #3 assignment returned]
5	10/5	• Introduction – Background, Significance, Literature review (JC) • Track Meetings *Sign-up for 2nd individual student-faculty meeting*	Email & post: • **Results** section (1st draft) • *Revisions* to previously submitted 1st drafts. Reading: 5G
6	Week of 10/19	Meeting #2 w/capstone faculty member	Email & post: • **Introduction** (1st draft): includes background, significance, literature review, agency background or setting, hypothesis) [Week #5 assignment returned]
7	10/26	• Discussion, Conclusions Recommendations (BP) • Abstract (BP)	Email & post: • **Discussion, conclusions** and **recommendations** (1st drafts)sections • **Structured abstract** Read : • "Explanation-Sources of Invalidity" and examine the two posted Sources of Invalidity Tables • 5A,C,E,F [Week #6 assignment returned]
8	11/2*	• How to structure and prepare your PowerPoint presentation (AS) • How to structure and prepare your Poster Presentation (AS) • Finalizing the portfolio (AS) • Track Meetings *Sign-up for 3rd individual student-faculty meeting*	^Notify: • Prof. Pavilonis and your capstone faculty of your choice to do a poster presentation or oral presentation. Email: • Completely assembled **1st complete draft** of paper for review by capstone faculty Review: • MPH and MS portfolios in the References section of this syllabus Read: • Instructions for preparing the portfolio at http://cuny.edu/site/sph/hunter-college/campus-resources/PortfolioInstructions.html/
9	Week of 11/9	Meeting #3 w/ capstone faculty member	Meet with capstone faculty member to discuss paper, presentation, and portfolio.
10	11/16*	• Student presentations (1)	Critiqued 1st draft of your paper returned & discussed

#	Date	Topic	Assignment All submissions to your capstone faculty member are via email. When indicated, also *post* on the Bb Discussion Board. Readings in the References section are optional, but *strongly recommended*. ^Applies to all students, including those doing Master's Essays.
11	11/23*	• Student presentations (2)	Email: **2nd draft of fully-assembled paper.** Your 2nd draft will be forwarded to a outside (2nd) reader
12	11/30*	• Student presentations (3)	^Email: • **Portfolio draft** (including up to 8 attachments) http://www.formstack.com/forms/?1143594-R3iqXqGNXR
13	12/7*	• Student presentations (4)	Critiqued 2nd draft of paper returned from capstone faculty member and external reviewer
14	12/14*	• Student presentations (5)	^Critiqued draft of portfolio returned from capstone faculty.
15	12/21*	• Student presentations (6)	^Upload on Formstack: • **Final portfolio** with up to 8 attachments http://www.formstack.com/forms/?1143594-R3iqXqGNXR and • **Final capstone paper or master's essay, response letter**, **PPT** (for oral presentation or poster), and **1-page summary** (of poster or oral) http://www.formstack.com/forms/?1084540-R3iqXqGNXR

NB: While the overall content of this course will be covered as outlined, the syllabus may change based on the need to adapt to student interests, feedback and expertise. Always check the Bb site for the most up-to-date information on course readings and assignments.

B.Master's essay students work with their first and second readers throughout the semester, and have 1st assignments that must be turned in to the capstone faculty member by the specified due date (see below). The schedule of submissions of paper drafts should be arranged with the first reader as early in the semester as possible. Master's essay students must attend class attend class sessions 8/31, 11/2, 11/16-12/21

Due date	**Assignment for master's essay students**
8/31	Email & post title of the master's essay and advise your Capstone faculty of your 1st & 2nd readers. Your capstone faculty member may serve as one of your readers.
Thurs 9/10	Email master's essay proposal to your readers. Your capstone faculty member and at least one other reader must approve the proposal.
9/21	Email and post approved proposal.
11/2	Notify Prof. Pavilonis and your capstone faculty of your choice to do a poster presentation or oral presentation.
11/30	Email portfolio draft (including up to 8 attachments). http://www.formstack.com/forms/?1143594-R3iqXqGNXR
12/14	Submit to capstone faculty member and reader/s the final copy of the master's essay and response letter
12/21	Upload on Formstack: • Final portfolio with up to 8 attachments http://www.formstack.com/forms/?1143594-R3iqXqGNXR and • Final master's essay, response letter, PPT (for oral presentation or poster), and 1-page summary (of poster or oral) http://www.formstack.com/forms/?1084540-R3iqXqGNXR

References, resources, and readings

WRITING THE CAPSTONE PAPER

1. Practical advice

For practical advice, look into the writing center at any major college or university, for example:

- Purdue Online Writing Lab (OWL). http://owl.english.purdue.edu/
- Hunter College Writing Center. http://rwc.hunter.cuny.edu/

2. Style

Unless indicated otherwise, papers submitted in PH 738: Capstone Seminar follow the style of the *American Journal of Public Health* (*AJPH*). The *AJPH* style is the same as that of the American Medical Association (AMA).

- *AJPH's* instructions for authors. http://ajph.aphapublications.org/userimages/ContentEditor/1318438422261/Instructions_for_Authors.pdf
- AMA Style Stat! For Research Papers. A quick reference to using the AMA style in college research papers. http://www.docstyles.com/library/amastat.pdf

3. Organization of the capstone paper

It is customary to organize the capstone paper using the IMRAD format: *Introduction, Method, Results And Discussion*. The IMRAD structure is not an arbitrary organization, but a direct reflection of the process of scientific discovery. AMA Stat! presents these variations on the IMRAD theme, which are also acceptable:

- For reports of original data: Context, Objective, Design, Setting, Population, Intervention(s), Main Outcome Measure(s), and Results.
- For a systematic literature review: Context, Objective, Data Sources, Study Selection, Data Extraction, Results, and Conclusions.

Please see the AMA Stat! website for detailed descriptions:
http://writingcenter.missouristate.edu/assets/WritingCenter/amastat.pdf

4. The capstone paper in general

- How to write all sections of a research paper Rice Univ: http://www.ruf.rice.edu/~bioslabs/resources_home.html
- Writing a research article: advice to beginners. http://intqhc.oxfordjournals.org/content/16/3/191.full/
- How to write a paper. Bates College: http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html
- Writing research papers. Rice Univ: http://www.ruf.rice.edu/~bioslabs/tools/report/reportform.html
- Guide to writing a formal physics lab report [despite the title, this has relevance for all science writing]. Union College. http://www.union.edu/Resources/Academic/writing/Help/Faculty/Orzel/GuideToWritingLabReports.php
- Preparation of the research report /scientific paper . http://www.sagepub.com/bjohnsonstudy/notes/Ch20_Lecture.doc
- How to write your thesis. [This could be titled 'How to write your capstone paper.'] http://www.ldeo.columbia.edu/~martins/sen_sem/thesis_org.html#Conclusions

5, Key sections of the capstone paper

A. Structured abstract

- Importance of 250 words (PPT): http://www.jpgmonline.com/documents/author/24/4_Aggarwal_11.pdf
- The structured abstract: http://research.mlanet.org/structured_abstract.html
- Structured abstracts: http://www.nlm.nih.gov/bsd/policy/structured_abstracts.html

B. Introduction/Background

- UNC: http://writingcenter.unc.edu/handouts/introductions/
- How to write the background/introduction section (PPT).
- How to write a literature review.

http://www.sportsci.org/jour/9901/wghreview.html

- Sample research paper. Although this paper is in the APA style, this site is worth examining for the side notes and also to see how the background section segues into the methodology and results sections of the paper. http://thewritesource.com/apa/apa.pdf
- Synthesis writing. Drew Univ: http://www.users.drew.edu/sjamieso/Synthesis.pdf

C. Methods

- How to write the methods section of a research paper. http://cancer.dartmouth.edu/documents/pdf/methods_section.pdf
- Logic model
  Please refer to your PH 737 notes.
- Threats to validity
  --Campbell, D.T. & Stanley, J.(1963). *Experimental and Quasi-Experimental Designs for Research*. Boston: Houghton Mifflin.
  --Trochim, W. *Research Methods Knowledge Base*. http://www.socialresearchmethods.net/kb/intval.php and http://www.socialresearchmethods.net/kb/external.php

D. Results

- A strategy for writing up research results. http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWstrategy.html

E. Discussion

- How to write an effective discussion. http://www.rcjournal.com/contents/10.04/10.04.1238.pdf

F. Conclusions

- UNC: http://writingcenter.unc.edu/resources/handouts-demos/writing-the-paper/conclusions

G. Bibliography/Citations

Unless indicated otherwise, papers submitted in PH 738: Capstone Seminar follow the style of the *American Journal of Public Health* (*AJPH*). The *AJPH* style is the same as that of the American Medical Association (AMA).

- *AJPH's* instructions for authors. http://ajph.aphapublications.org/userimages/ContentEditor/1318438422261/Instructions_for_Authors.pdf
- AMA Style Stat! For Research Papers. A quick reference to using the AMA style in college research papers. http://www.docstyles.com/library/amastat.pdf
- Quick Citation Guide. Penn State: Penn State: http://www.libraries.psu.edu/content/psul/researchguides/citationstyles/CSE_citation.html#cse-citations

Annotated bibliographies.

- UNC: http://writingcenter.unc.edu/handouts/annotated-bibliographies/
- Univ Wisconsin:. http://writing.wisc.edu/Handbook/AnnotatedBibliography.html/
- Purdue: http://owl.english.purdue.edu/.

MPH AND MS PORTFOLIOS

- Hunter College Portfolio Handbook (in revision): http://www.cuny.edu/site/sph/hunter-college/campus-resources/PortfolioInstructions/Portfolio_5102011.pdf
- Univ of Florida (2009): http://mph.ufl.edu/students/on-campus-students/mph-portfolio/
- Medical College of Wisconsin (2011): http://www.mcw.edu/FileLibrary/Groups/MPHProgram/Student_Handbook.pdf (pp. 10-11)
- University of Missouri (n.d.): http://publichealth.missouri.edu/assets/StudentPortfolioGuidelines.pdf

Last Updated August 26, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 75000: Fundamentals of Biostatistics
3 Credits
Fall 2015

Time and location	This is an online course. All class activities will take place on Blackboard. A week in this class starts on Monday and ends on Sunday. Weekly online real-time review sessions (via Blackboard Collaborate) are scheduled on Wednesdays and Thursdays 7.00-8.30PM.
Instructor	Lead instructors: • Katarzyna Wyka, PhD: kwyka@hunter.cuny.edu (response time 24-48 hours) • Hongbin Zhang, PhD: hongbin.zhang@sph.cuny.edu (response time 24-48 hours) Co-instructors: • Jonathon Rendina, PhD hrendina@hunter.cuny.edu (response time 24-48 hours) • Marcel Ramos, MPH Marcel.Ramos45@myhunter.cuny.edu (response time 24-48 hours) Note: Always include "PH750" in the subject line.

Office hours	• Katarzyna Wyka, PhD:
	  ○ Online: Mondays 4.30-6PM via Blackboard Collaborate
	  ○ In person: Mondays, 6.00-7PM (Silberman Building, Room 537) or by appointment
	• Hongbin Zhang, PhD:
	  ○ Online: Tuesdays 4.30-6PM via Blackboard Collaborate
	  ○ In person: Tuesdays, 6.00-7PM (55 W 125 Street, Room 806) or by appointment

Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Application and interpretation of basic descriptive and inferential statistical methods for the analysis of public health and other health-related data.
Course prerequisites	Elementary statistics or calculus or equivalent.
Course format	This is an online course. All class activities are online and include lectures and labs, real-time review sessions, quizzes, discussions, and a group project. This is not a self-paced course. It is extremely important that students devote 5-10 hours for the class on a weekly basis to keep up with class activities and interactions.
Required reading and resources	None

Suggested reading and resources	*OpenIntro Statistics: Third Edition*. CreateSpace Independent Publishing Platform. Diez, D. M., Barr, C. D., Cetinkaya-Rundel M. (2015). **ISBN-10:** 194345003X, **ISBN-13:** 978-1943450039 A digital version is available free at http://www.openintro.org/stat/textbook.php. A print version is available for $10.14 from amazon.com, linked to from the website above. *Statistics: The Art and Science of Learning from Data* Alan Agresti & Christine Franklin Pearson Prentice Hall, 2 edition (2009) ISBN 978-0-13-513199-2 Note: 3rd edition is available, but more expensive and not necessary We strongly suggest that you purchase student license for PASW(SPSS) to use the software at home. Information on obtaining it is on Blackboard. Note that almost all computers in the libraries and Public Computing Services (PCS) labs at the Silberman Building, Brookdale and at 68th Street have PASW(SPSS) software installed. In addition, the Hunter College library operates a laptop loan program: http://library.hunter.cuny.edu/services/laptoploan. Such laptops would also have PASW (SPSS) and Microsoft products installed.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Explain the role and importance of bio-statistical analysis in public health research • Design an appropriate statistical analysis for a given public health research design • Recognize ethical principles and legal standards that should be followed in the collection, management and analysis of statistical data on human and non-human subjects	• Quizzes, final project, CITI training
Apply basic statistical and informatics techniques	• Perform statistical calculations using a statistical software package • Create graphics and visual representations of statistical data using a statistical software package • Apply appropriate statistical analysis techniques based on the size of the data	• SPSS/Excel exercise, final project
Communicate public health information through oral, written, digital and visual presentation	• Write the interpretation of results from statistical analysis • Create and present an oral presentation of statistical output	• Final project, final project presentation
Collect, analyze and interpret public health data	• Identify continuous, discrete, nominal and ordinal data • Summarize these data types using ◦ Bar charts, box plots, histograms, scatter plots ◦ measures of central tendency: mean, median, and mode of measures of spread: variance, interquartile range, range of frequency tables • Define and differentiate between precision and accuracy • Define and calculate marginal, joint and conditional probability • Use binomial distribution to calculate probabilities	• Quizzes, exams, final project

	associated with binary data • Convert count data to rates and proportions • Estimate centrality and variance of a sampling distribution from the population distribution using the Central Limit Theorem • Construct and interpret confidence intervals for population mean and population proportion • Population mean and population proportion • Large and small samples (using z and t sampling distributions) • Identify how changes in sample size, confidence level and other parameters affect the width of a confidence interval • Define null and alternative hypotheses for one-sided and two-sided inference • Perform inference tests for proportions using the normal approximation, for mean of a single sample, difference in means of two samples, and difference in means of paired samples • Use Z and t tables for hypothesis tests and constructing confidence intervals • Estimate the power of a t test • Calculate odds ratios, relative risks, and risk difference • Perform Pearson Chi-Square Test of Independence for r x c frequency tables • Perform and interpret one-way Analysis of Variance • Correct for multiple comparisons • Define type I and II error, power, and sample size and the relationships between them • Perform and interpret correlation and linear regression analysis	

Course Assessments

Your understanding of the course material will be evaluated through quizzes, two open book/notes exams, one group project, and class participation. For the best possible grade, you must demonstrate an understanding of covered concepts, as well as mastery of basic computer skills.

Class Quizzes: There are 13 online class quizzes corresponding to class materials. Deadlines for each quiz are posted in Class Schedule below (page 10) and within each class folder. All quizzes have a specific due date and answer keys will be posted 2 days after the deadline. You should post questions regarding quizzes in the Discussion Board (Q&A Forum). Check My Grades to view your grade and feedback.

Class Exams: There are two open book/notes non-cumulative exams. Class exams will be completed online via Blackboard. You will have one week to submit your exams. You are strongly encouraged to start working on your exam early in the week. Graded exams will be returned to students within 7 days. More information will be posted on Blackboard at the beginning of the exam week (9/28 & 11/16). Check My Grades to view your grade and feedback.

Group projects. You will be working in small groups (6 students). You will sign-up for a group during Week 3 (9/14-9/20) via Group Project Sign-up Sheet (located in Week 3 folder). Each group will chose a research topic and will prepare 1) a final report that will be submitted via Blackboard and 2) a PowerPoint presentation that will presented on 12/7 (6PM – 8.50PM) in real-time online presentations. Grading rubric is located in the Final Project tab. Project sections will be submitted throughout the semester (refer to Class Schedule on page 10). Project-related questions should be posted in the Discussion Board. Individual contributions will be evaluated using online peer-evaluations after each project section is submitted. All students who want a passing grade must complete the group project. Check My Grades to view your grade and feedback.

Class Participation: You are expected to participate in online class discussions via the Discussion Board. We will use the Discussion Board to clarify concepts covered in the class and answer questions pertaining to class material, quizzes and group projects. Each student is expected to contribute to the class by posting at least 5 questions/answers throughout the semester. Grading rubric is provided in the Discussion Board. Unprofessional and disrespectful posts will be removed and penalized. Check My Grades to view your grade and feedback.

Grading

Evaluation criteria

All assignments will be evaluated based upon rubrics found on the course website.

The relative weight of each course component is as follows:

Assessment	Weight
Quizzes	25%
Exams	25%
Group project	25%
Class participation	25%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual

reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

It is very important to keep connected and interact with class instructors and classmates throughout the semester. The majority of our communication will occur via Blackboard:

- Complete all weekly classwork in a timely manner
- Post class related questions on Discussion Board (Discussion Board > General Q&A)
- Interact with your classmates in the Student Lounge (Discussion Board > Student Lounge)
- In you would like to discuss a private matter email us directly

Online communication netiquette: All students are expected to follow rules of common courtesy in all online communication:

- Use a descriptive subject line that reflects the content of your message (e.g. “interpretation of p-value, class 7”; “hw1 question 3”). Write in short paragraphs and sign your message with your full name.
- Check the content of your message for grammatical and spelling errors. Do not write in UPPERCASE as this is often interpreted as shouting in text-based messages. You can use emotional symbols (e.g. :-)) to indicate the tone of your voice.

Late/incomplete submission of assignments

Late quizzes will be penalized by deducting 10% from the earned grade per day, with no credit after homework answer key is posted (end of Day 2). Late exams will not be accepted. Late group projects will not be accepted.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students

This is not a self-paced course. Students are expected to:

- Check email and Blackboard announcements on **daily** basis
- Access course materials on **weekly** basis
- Complete and submit **weekly** quizzes
- Participate in **weekly** discussion board
- Complete and submit other assignments **as required**
- Check My Grades to monitor progress and received feedback on **weekly** basis

Last Updated August 16, 2015

Expectations for the instructor

- Provide regular announcements and reminders on the course website and via email
- Answer questions posted on Discussion Board within 24 hours
- Respond to student email within 24-48 hours Monday through Friday
- Grade and provide feedback on assignments within 1 week of the due date
- Communicate grades and progress through Blackboard (My Grades)

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity
Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Last Updated August 16, 2015

Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Week	Topic	Reading	Assignment
0 8/27-8/30	**Getting started**	Syllabus	• Read syllabus • Complete quiz 0 (Syllabus quiz) • Introduce yourself on Blackboard • Read Online Student Resources • Run Blackboard Collaborate test • Read information about CITI training.
1 8/31-9/6	**Introduction** • Study designs & sampling • Types of data • Standardization (Age Adjustment)	Learning units 1 OpenS CH 1.1-1.5 AG CH 1	• Submit week 1 quiz • Complete SPSS/Excel exercise • Respond to Student introductions on Blackboard
2 9/7-9/13	**Data Summarization** • Tabular and graphical methods for describing data • Measuring center and spread	Learning units 2 OpenS CH 1.6-1.8 AG CH 2 & 3	• Submit week 2 quiz • Complete SPSS/Excel exercise
3 9/14-9/20	**The role of probability** • Conditional probability • Diagnostic testing 9/16 - Last day to drop without a grade of "W"	Learning units 3 OpenS CH 2 AG CH 4 & 5	• Submit week 3 quiz • Complete SPSS/Excel exercise • Sign up for Group Project
4 9/21-9/27	**Probability Distributions and applications** • The Normal distribution • The Binomial distribution	Learning units 4 OpenS CH 3 AG CH 6	• Submit week 4 quiz • Complete SPSS/Excel exercise • Choose topic for Group Project
5 9/28-10/4	**EXAM 1**		• Submit Exam 1 • Submit Group project: Section 1 & 2 • Submit peer-evaluations
6 10/5-10/11	**Sampling distributions** • Sampling distribution of the mean • Sampling distribution of a proportion	Learning units 6 OpenS CH 4.1&4.4 AG CH 7	• Submit class 6 quiz • Complete SPSS/Excel exercise

7 10/12- 10/18	**Estimation of Confidence Intervals** • Confidence intervals for a population mean • Confidence intervals for a population proportion	Learning units 7 OpenS CH 4.2 & 4.5 AG CH 8	• Submit week 7 quiz • Complete SPSS/Excel exercise
8 10/19- 10/25	**Hypothesis Testing** • Hypotheses & test procedures • One-sample tests for a population mean • One-sample tests a population proportion	Learning units 8 OpenS CH 4.3 & 5.1-5.2 & 6.1 AG CH 9	• Submit week 8 quiz • Complete SPSS/Excel exercise
9 10/26- 11/1	**Hypothesis Testing** • Two-sample tests for a population mean • Two-sample tests for a population proportion	Learning units 9 OpenS CH 5.3-5.4 & 6.2 AG CH 10	• Submit week 9 quiz • Complete SPSS/Excel exercise
10 11/2-11/8	**Hypothesis Testing** • One-way ANOVA • Power and sample size determination	Learning units 10 OpenS CH 5.5 AG CH 14	• Submit week 10 quiz • Complete SPSS/Excel exercise
11 11/9- 11/15	**Contingency Tables** • Odds Ratio/relative risk • Pearson's Chi-square/Fisher exact test 11/9 - Last day to withdraw with a grade of 'W'	Learning units 11 OpenS CH 6.4 AG CH 11	• Submit week 11 quiz • Complete SPSS/Excel exercise
12 11/16- 11/22	**EXAM 2**		• Submit Exam 2 • Submit Group project: Section 3 & 4 • Submit peer-evaluations
13 11/23- 11/29	**Simple Linear Regression** • Correlation • Simple linear regression	Learning units 13 OpenS CH 7.1-7.3 AG CH 12	• Submit week 13 quiz • Complete SPSS/Excel exercise
14 11/30- 12/6	**Multivariable Regression** • Multiple linear regression • Introduction to logistic regression	Learning units 14 OpenS CH 7.4 & 8 AG CH 13	• Submit week 14 quiz • Complete SPSS/Excel exercise
15 12/7 (6PM – 8.50PM)	**Final Project Presentations**		• Submit final Group project • Participate in online project presentations • Submit CITI training certificate to BB.

Note: OpenS=*OpenIntro Statistics* textbook, AG = Agresti & Franklin textbook

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 75100: Principles of Biostatistics
3 Credits
Fall 2015

Time and location	***Lectures*** will be held on Mondays, 5-6 pm, led by Dr. Levi Waldron, in Silberman 217 and via our YouTube channel at http://tinyurl.com/ph751fall2015. ***Computer Lab Sessions*** led by Tony DeVito will be held on Mondays, 6:10-7:50 pm in Silberman C-09 (basement computer lab). Details for online attendance will be sent via Blackboard.
Instructor And Office Hours	Levi Waldron, PhD, levi.waldron@hunter.cuny.edu. Office Hours: schedule appointments at https://calendly.com/lwaldron. Tony Devito, MS, adevito@hunter.cuny.edu Office Hours: by appointment
Course website	Essential announcements will be made through Blackboard. Ongoing Q&A will be held through the course's Google Group; please sign up at https://groups.google.com/forum/#!forum/ph751fall2015 (email and web-only options available; you do not need a Google account).
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This is a first-level requirement for students specializing in EPI-BIOS, who will take subsequent intermediate and advanced level biostatistics courses. It will introduce students to the theoretical basis for and practical application of common statistical methods and principles used in public health.
Course prerequisites	Evidence of quantitative abilities, such as college-level algebra with a grade of B+ or better, GRE scores ≥550 and analytic scores ≥4.5. The course does not require calculus or linear algebra. Access to computers and basic computer skills are required for many course functions
Course format	The course is taught through lectures, computer exercises using data management and statistical packages and hand-calculations.
Required reading and resources	Diez, D. M. (2015). OpenIntro Statistics: Third Edition. CreateSpace Independent Publishing Platform. ISBN-10: 1478217200, ISBN-13: 978-1478217206

	A digital version is available free at http://www.openintro.org/stat/textbook.php. A print version is available for $8.17 from amazon.com. Note: please keep notes of anything that could be improved in this textbook. It is licensed under the Creative Commons, and Professor Waldron will make modifications to the book according to your suggestions. Students may use the software of their choice, however lab instruction will make use of PASW (SPSS) and occasionally Microsoft Excel. Students interested in learning a more extensive statistics package may consider using the free software R (http://www.cran.r-project.org, http://www.rstudio.com); Professor Waldron will support the use of R during lab sessions. You will also need to regularly access the class electronic Black Board (Bb) site for Assignments, Class Materials and updates. Thus, having a personal computer capable of doing these things is an important advantage in completing assignments and gaining a familiarity with the programs we will be using. Hunter College has a site license that enables students to obtain most software, including PASW (SPSS) at a significantly discounted price. Please check the ICIT site at: http://www.hunter.cuny.edu/icit/welcome/Student-Computing-Technology. If you find yourself deprived of such hardware or software, almost all of the computers in the libraries and Public Computing Services (PCS) labs at the Silberman Building, Brookdale and at 68th Street have these core programs installed. It will take some determination to take this route without being at a bit of a disadvantage but not impossible. In addition, the Hunter College library operates a laptop loan program: http://library.hunter.cuny.edu/services/laptoploan. Such laptops would also have PASW (SPSS) and Microsoft products installed.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Design an appropriate statistical analysis for a given public health research design	• HW1-5, exams 1-2, final project
Apply basic statistical and informatics techniques	• Perform statistical calculations using a statistical software package • Create graphics and visual representations of statistical data using a statistical software package • Apply appropriate statistical analysis techniques based on the size of the data	• HW1-5, exams 1-2, final project
Communicate public health information through oral, written, digital and visual presentation	• Write the interpretation of results from statistical analysis • Create and present an oral presentation of statistical output	• final project
Collect, analyze and interpret public health data	• Identify continuous, discrete, nominal and ordinal data • Summarize these data types using • Bar charts, box plots, histograms, scatter plots • Measures of central tendency: mean, median, and mode of measures of spread: variance, interquartile range, range of frequency tables • Define and differentiate between precision and accuracy	• HW1-5, exams 1-2, final project

	• Define and calculate marginal, joint and conditional probability
	• Use binomial distribution to calculate probabilities associated with binary data
	• Convert count data to rates and proportions
	• Estimate centrality and variance of a sampling distribution from the population distribution using the Central Limit Theorem
	• Construct and interpret confidence intervals for:
	  ◦ Population mean and population proportion
	  ◦ Large and small samples (using z and t sampling distributions)
	• Identify how changes in sample size, confidence level and other parameters affect the width of a confidence interval
	• Define null and alternative hypotheses for one-sided and two-sided inference
	• Perform inference tests for proportions using the normal approximation, for mean of a single sample, difference in means of two samples, and difference in means of paired samples
	• Use Z and t tables for hypothesis tests and constructing confidence intervals
	• Estimate the power of a t test
	• Calculate odds ratios, relative risks, and risk difference
	• Perform Pearson Chi□Square Test of Independence for r x c frequency tables	

	• Perform and interpret one-way Analysis of Variance • Correct for multiple comparisons • Define type I and II error, power, and sample size and the relationships between them • Perform and interpret correlation and linear regression analysis	

Course Assessments

Your understanding of the course material will be evaluated through two open book/notes in-class exams, take-home homeworks and a final project. All students who want a passing grade must complete the final project and exams. For the best possible grade, you must demonstrate an understanding of basic concepts, as well as mastery of basic computer skills.

Grading

Evaluation criteria

The relative weight of each course component is as follows:

Assessment	Weight
Homeworks	30%
Exam 1	15%
Exam 2	15%
Final Project	30%
Class Participation	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Students can attend the class either in-person or online. In-class attendance is mandatory only for the first class meeting, exams, and poster presentation of the final project.

You are expected to access Blackboard or post to the Google Group regularly, which includes posting and responding to questions posted there. You are also required to actively participate in all activities related to the Final Project and poster presentations (for full details refer to the Final Project description located in Assignments section of Blackboard).

Late/incomplete submission of assignments

If you will not be able to attend a test due to special circumstances, inform us in advance to make alternative arrangements.

Make-ups, rewrites, and extra credit

All homeworks will have a specific due date and will be returned to students within 7 days. Late homeworks will be penalized by deducting 10% from the earned grade per day, with no credit after 5 days. Late submissions will not be accepted once homework answer key is posted. Late homework is vigorously discouraged - much of the coursework builds on material learned in previous sessions, putting students who fall behind on homework at a serious disadvantage.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Help with Research and Writing

The Hunter College Reading/Writing Center is a comprehensive service for the college community providing tutorial and computer-assisted instruction to students and technical support and development to faculty and staff. The center offers tutorial services to all registered students at the college and provides computer facilities for Hunter students, faculty, staff and alumni. Students may utilize the center on an individual basis during scheduled hours of operation or access the center's online tutorial service. The center also offers a series of workshops on various topics relating to academic reading and writing, computer applications and electronic communication. In addition, students may access the center's extensive online resource file of instructional handouts or use the center's library of textbooks and materials. For additional information concerning hours of operation and description of services, go to the Reading/Writing Center website: http://rwc.hunter.cuny.edu/.

Grade of Incomplete

Students wishing to request an Incomplete (IN) grade must do so in writing explaining the reasons, AND have AT LEAST a C average. For an IN grade to be changed to a letter grade, all missing course work must be completed within one year after the IN grade is entered. If not changed to a letter grade within one year, the IN grade will become permanent.

Grade Appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor regarding the accuracy of the grade received. This conference should be held within the first three weeks of the semester following receipt of the

grade. At this time, errors may be corrected. If the grade is not an error, the student and instructor must together review all class material pertinent to the grade. If the student is not satisfied, or the instructor does not confer with the student within the first three weeks of the semester, the student should promptly contact the department chair by submitting a written appeal, consisting of a statement giving the factual reasons and basis for the complaint. The student has the right to request in writing that the chair appoint a student as a member to the department/school Grade Appeals Committee. This appeal at the department/school level must be submitted within the first five weeks of the semester following receipt of the grade, in accordance with the "College-wide Grade Appeals Procedures" adopted by the Senate in fall 1985. Copies of this procedure may be obtained at http://www.hunter.cuny.edu/provost/repository/files/COLLEGE-WIDE%20GRADE%20APPEALS%20PROCEDURES%205-4-05.pdf/view.

Last day to drop the course:

- Last day to drop class with the grade of "W": November 9

Course Schedule

The course schedule is subject to change throughout the semester. The “Last Updated” Date in the header of this syllabus is indicates the version of the syllabus.

See the current academic calendar (link below) for important dates (for example: holidays, course drop, course withdrawal):

http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%20-Repaired-FINAL.pdf

Consider listing key course withdrawal dates in the schedule.

Last Updated July 23, 2015

Session	Date	Topic	Suggested reading from OpenIntro Stat	Assignment
1	8/31 in-class attendance mandatory	Data Types and Presentation Introduction and outline Types of Data Observational and experimental studies Samples and populations	1.1-1.5	
2	9/10 Thursday No meeting 9/7 Labor Day	Data Summarization and Types of Studies Measuring center: mean, median, mode Measuring spread: variance, IQR Tabular and Graphical Methods for Describing Data	1.6-1.9	HW1 assigned covering 1, 2
holiday	9/14	Rosh Hashana – no class		
3	9/21	Probability and Diagnostic Tests Properties of probability Conditional probability Diagnostic testing	chapter 2	HW1 due HW2 assigned covering 3,4
4	9/28	Probability Distributions and Applications Random Variables Normal Random Variables; empirical rule Binomial Random Variables	3.1-3.4	
	10/5 in-class attendance mandatory	IN-CLASS Exam in C-09		covering classes 1-4 HW2 due
holiday	10/12	Columbus Day – no class		
5	10/19	Sampling distributions and Central Limit Theorem Population vs. sampling distributions Sampling distribution of a mean CLT and standard error Sampling distribution of a proportion Sampling strategies	4.1, 4.4	HW3 assigned covering 5
6	10/26	Estimation of Confidence Intervals Confidence intervals for a population mean Confidence intervals for a population proportion	4.2	HW3 due HW4 assigned covering 6

7	11/2	Hypothesis Testing Hypotheses & test procedures One-sample tests for a population mean One-sample tests a population proportion Types I & II errors and power	4.3, 4.6, 5.1	HW4 due
8	11/9	Small sample estimation Student's t distribution for CI estimation and 1 and 2-sample hypothesis testing Comparing Two Means: Paired Samples Comparing Two Means: Independent Samples Comparing Two Proportions		
	11/16 in-class attendance mandatory	IN-CLASS EXAM IN C-09		covering classes 5-8
9	11/23	Power & Sample Size Estimation Concept of power & sample size estimation, calculation for 2 samples Analysis of Variance One Way Analysis of Variance Multiple Comparisons	5.2	HW5 assigned covering 9 Final project assigned
10	11/30	Contingency Tables Odds Ratio/relative risk Pearson's Chi-square/Fisher exact test	5.5	Final project Introduction due HW5 due
11	12/7	Linear Regression Correlation Simple linear regression	6.1-6.2	 Final project Results due
12	12/14	Extensions to linear regression: • logistic regression • multiple regression • non-parametric alternatives to correlation and 1-2 sample hypothesis tests		Final project Methods and Discussion due
	12/21 in-class attendance mandatory	Final Project Presentations – room 217		Final project: final submission due

Last Updated July 23, 2015

Statistical Notation

The following glossary of statistical notation is adapted from http://stattrek.com/statistics/notation.aspx, and will be used throughout the course.

Greek vs. Roman Letters

Like capital letters, Greek letters refer to population attributes. Their sample counterparts, however, are usually Roman letters. For example,

- μ refers to a population mean; and x, to a sample mean.
- σ refers to the standard deviation of a population; and s, to the standard deviation of a sample.

Population Parameters

By convention, specific symbols represent certain population parameters. For example,

- μ refers to a population mean.
- σ refers to the standard deviation of a population.
- σ^2 refers to the variance of a population.
- P refers to the proportion of population elements that have a particular attribute.
- Q refers to the proportion of population elements that *do not* have a particular attribute, so $Q = 1 - P$.
- ρ is the population correlation coefficient, based on all of the elements from a population.
- N is the number of elements in a population.

Sample Statistics

By convention, specific symbols represent certain sample statistics. For example,

- $\bar{x}$ refers to a sample mean.
- s refers to the standard deviation of a sample.
- s^2 refers to the variance of a sample.
- p refers to the proportion of sample elements that have a particular attribute.
- q refers to the proportion of sample elements that *do not* have a particular attribute, so $q = 1 - p$.
- r is the sample correlation coefficient, based on all of the elements from a sample.
- n is the number of elements in a sample.

Capitalization

In general, capital letters refer to population attributes (i.e., parameters); and lower-case letters refer to sample attributes (i.e., statistics). For example,

- *P* refers to a population proportion; and *p*, to a sample proportion.
- *X* refers to a set of population elements; and *x*, to a set of sample elements.
- *N* refers to population size and *n* refers to sample size.

Probability

- P(A) refers to the probability that event A will occur.
- P(A|B) refers to the conditional probability that event A occurs, given that event B has occurred.
- $P(A^c)$ refers to the probability of the complement of event A (not A).
- P(A ∩ B) refers to the probability of the intersection of events A and B (A *and* B occur).
- P(A ∪ B) refers to the probability of the union of events A and B (A *or* B occurs).

Counting

- n! refers to the factorial of n.

Hypothesis Testing

- H_0 refers to a null hypothesis.
- H_1 or H_a refers to an alternative hypothesis.
- α refers to the significance level, or probability of committing a Type I error.
- β refers to the probability of committing a Type II error.

Random Variables

- *Z* or *z* refers to a standardized score, also known as a z score.
- z_α refers to the standardized score that has a cumulative probability equal to 1 – α, where α is the type I error rate.
- t_α refers to the t score that has a cumulative probability equal to 1 - α.
- f_α refers to the f statistic that has a cumulative probability equal to 1 - α.
- $f_\alpha(v_1, v_2)$ is the f statistic with a cumulative probability of 1 - α, and v_1 and v_2 degrees of freedom.
- X^2 refers to a chi-square statistic.

Special Symbols

- Σ is the summation symbol, used to compute sums over a range of values.
- Σx or Σx_i refers to the sum of a set of *n* observations. Thus, $\Sigma x_i = \Sigma x = x_1 + x_2 + \ldots + x_n$.
- *sqrt* refers to the square root function, i.e., sqrt(4) = 2.
- Var(X) refers to the variance of the random variable X.
- SD(X) refers to the standard deviation of the random variable X.

- SE refers to the standard error of a statistic.
- ME refers to the margin of error.
- DF refers to the degrees of freedom.

Regression

- E(X) refers to the expected value of random variable X.
- B_0 is the intercept constant in a population regression line.
- B_1 is the regression coefficient (i.e., slope) in a population regression line.
- R^2 refers to the coefficient of determination.
- b_0 is the intercept constant in a sample regression line.
- b_1 refers to the regression coefficient in a sample regression line (i.e., the slope).
- s_{b1} refers to the refers to the standard error of the slope of a regression line.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 75200: Fundamentals of Epidemiology
3 Credits
Fall 2015

Time and location	This is a hybrid course which means the course will be taught partially online and partially in person. In-person sessions will be held Mondays from 5-7:50pm Silberman, Rm 328 (lecture) and Rm C05 (lab) Online sessions are not held live. Instead, they can be viewed on your own time via Adobe Connect. Please see additional details below. Also, consult the Course Schedule below for dates of online and in-person sessions.
Instructor	Sheng Li, PhD, MD, MPH — Rosann Costa, MA **Email** sheng.li@sph.cuny.edu — rc181@columbia.edu **Phone** 212-396-7746 (temp) — 212-305-9346 E-mail is the preferable method of contact for both instructors.
Office hours	Sheng Li Silberman, Rm 546 (temp) Mon, 2:30-4:30pm Rosann Costa Silberman Rm C05 or C08 Thurs, 9-10pm & Mon*, 8-9pm & by appointment If possible, please provide the instructor with advance notice that you wish to attend office hours. *after in-person sessions only
Course website	https://bbhosted.cuny.edu/
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Apply principles and methods of epidemiological analysis. Identify and interpret epidemiological data. Illustrate and investigate incidence, distribution, determinants, and control of disease.
Course prerequisites	N/A

Course format	▪ In-person sessions will typically begin with a lecture (approximately 1-2 hours), followed by a five minute break and then a practical hands-on SPSS exercise (approximately 1-1.5 hours). Any remaining time will be used for review and questions. ▪ Online sessions will involve viewing a recorded lecture/lab exercise via Adobe Connect from any location of your choosing on your own time. These sessions are NOT held live.
Required reading and resources	Gordis L. *Epidemiology*. 4th or 5th ed. Philadelphia, PA: Saunders Elsevier, 2009 or 2013. *(on reserve at the Silberman library)* Additional assigned articles will be posted on Blackboard. Required to subscribe by email to *Morbidity and Mortality Weekly Reports*, published by the CDC: http://www.cdc.gov/mmwr/ *(no fee)*
Suggested reading/ resources and hardware/software	Aschengrau A, Seage III GR. *Essentials of Epidemiology in Public Health*. 3rd ed. Sudbury, MA: Jones & Bartlett, 2014. Rothman K. *Epidemiology – An introduction.* New York, NY: Oxford University Press, 2002. *(Both of these texts are on reserve at the Silberman library)* SPSS will be used in class and will be required for parts of the three HW assignments. The Hunter College license covers only on-campus use. The SPSS software is available for student use in the library and in computer labs at multiple Hunter campuses. Students who wish to purchase a student copy of SPSS can do so at www.onthehub.com. *SPSS Statistics Base GradPack 23* for 6 months for Mac or Windows for approximately $40 will suffice for this course. Again, purchasing SPSS is NOT required for this course as long as you can regularly access the library and/or computer labs to complete the SPSS-related HW sections. You will NOT need to have SPSS on your personal computer in order to view the online SPSS lab exercises but you will definitely need SPSS access to complete the HWs. Aside from an internet connection, you will not need any special hardware/software to view the webcasts. You will click on a provided link and watch your screen/listen through your speakers/headphones as the instructor runs through a lecture/lab which can be paused, fast forwarded, rewound and saved for your viewing as often as you wish. You may want to bring a basic calculator with you to class. A calculator will be needed for the Final Exam and Quiz; cell phone calculators will NOT be permitted. The instructors recommend bringing a flash drive to save your in-class SPSS work, although these are not required.

Last Updated September 8, 2015

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Describe in writing the purpose of surveillance and how surveillance is used in public health practice • Explain the difference between incidence and prevalence • Describe the process of identifying and testing potential targets of intervention and give examples of effective and ineffective public health interventions • Describe the process of identifying vulnerable sub-populations, and give examples • Describe under what conditions screening is appropriate	• HW 1-3 • Paper 1 • In-class quiz • Final exam
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe epidemiological studies, including observational, quasi-experimental and experimental studies • Differentiate between primary and secondary data collection and identify possible sources of secondary data • Explain the difference between correlation and causation; risk factors/predictors and causes • Describe the causal inferences which can be made from experimental, quasi-experimental and observational studies using published examples	• HW 1-3 • Critique • In-class quiz • Final exam

Last Updated September 8, 2015

Core Competencies	Course Learning Objectives	Assessment Methods
Adhere to ethical and social justice principles and standards	• Describe circumstances in which an experimental study would and would not be ethical • Describe major disparities in life expectancy nationally and globally	• Final exam
Interpret and analyze public health literature and apply evidence-based research	• Access and use published data to accurately describe in writing the health of populations and factors that affect health in terms of person, time and place characteristics • Distinguish between narrative and systematic reviews • Systematically review the literature on a specific topic using a PICO question	• Paper 1 • HW 1-3 • Final exam
Apply basic statistical and informatics techniques	• Explain in a few sentences the principle of screening • Define lead time and length bias and how these biases may impact screening program evaluation • Describe in a few short sentences sensitivity, specificity, positive predictive value and negative predict value of a screening test compared to a gold standard test • Calculate and interpret a mean, a proportion, a rate and an odds ratio, • Explain the difference between relative and absolute risk • Calculate age-standardized rates	• HW 1-3 • In-class quiz • Final exam

Core Competencies	Course Learning Objectives	Assessment Methods
Communicate public health information through oral, written, digital & visual presentation	• Describe the validity, utility and feasibility of tests used for screening and diagnosis of health conditions • Present visually information on key public health topics such as the major causes of death nationally and globally	• Paper 1 • HW 1-3 • Final exam
Design and evaluate interventions to prevent or control public health problems	• List the strengths and weaknesses of different techniques for evaluating interventions • List the strengths and weaknesses of different techniques for controlling public health problems	• HW 1-3 • Critique • Final exam
Collect, analyze and interpret public health data	• Explain how to choose and apply appropriate study designs to answer a research question • Explain the interpretation of different measures of population health, such as life expectancy, quality adjusted life years	• HW 1-3 • Paper 1 • Critique • Final exam

Course Assessments

Use of Blackboard (Bb)
No later than the first week of class, you must sign up for Blackboard to receive updates, in-class materials, recorded lectures, readings and assignments, as well as to submit your assignments. For instructions on registering for Bb, go to: http://bb.hunter.cuny.edu. Please make sure that you have access to Bb Hunter College.

If you encounter problems with Bb at any time throughout the semester, please immediately contact the Bb Helpdesk who have the expertise to assist you. The Bb contact information is (212) 650-3624 and studenthelpdesk@hunter.cuny.edu. *Instructors cannot assist students with Bb.*

Submission of assignments through Blackboard
In an attempt to save paper, homework and written assignments should be submitted electronically. Suggestions for other adjustments to the course to reduce environmental impact are always welcome. Be sure to check your Hunter email address and Blackboard regularly for class announcements and assignments.

Step-by-step instructions for uploading assignments onto Blackboard will be provided on each assignment. After uploading an assignment, the instructor recommends that you log out and then back in again to ensure your assignment has successfully posted to avoid receiving lateness point deductions. If Blackboard is down when attempting to upload an assignment, please email the assignment to the instructor by the due date/time. **PLEASE DO NOT FORGET TO INSERT YOUR NAME ON THE FIRST PAGE OF ALL ASSIGNMENTS.**

VERY IMPORTANT: BE SURE TO CHECK YOUR HUNTER EMAIL AND BLACKBOARD *AT LEAST ONCE DAILY* FOR CLASS ANNOUNCEMENTS AND ASSIGNMENTS. SINCE THE COURSE IS SCHEDULED TO BE HELD PARTIALLY ONLINE, MANY IMPORTANT ANNOUNCEMENTS WILL BE SENT VIA EMAIL. DURING THE FIRST WEEK OF THE SEMESTER, PLEASE CHECK THE EMAIL ADDRESS OF YOUR HUNTER ACCOUNT AND CONFIRM THAT YOU ARE ABLE TO RETRIEVE MESSAGES SENT TO THIS ACCOUNT. THE BLACKBOARD HELPDESK WILL BE GLAD TO HELP.

Homework assignments: There will be 3 graded homework assignments to complete over the semester which will be posted on Bb well in advance of the due date. Each assignment will include multiple choice, short answer and SPSS questions. The assignments are organized according to the class lecture schedule so you may work through the assignment over time, completing the applicable sections soon after each lecture rather than leaving the assignment to the last minute. The final homework grade will be based on the highest 2 grades of the 3 assignments ONLY if all 3 assignments have been fully completed (this includes the SPSS section) and submitted as described

above. **Again, the lowest HW will NOT be dropped unless each HW is fully completed and submitted by the due date, including each SPSS section of the HW.**

Descriptive epidemiology assignment: Conduct a literature search on one health condition of your choice and write a 3-4 page paper (double spaced, 12-point font, 1 inch margins) describing the epidemiology of this condition in terms of person, place and time. You must have at least 10 citations from the public health literature (peer-reviewed journals instead of websites). Please be sure to appropriately cite other people's work in AMA reference style.

An ungraded bibliography will be due several weeks prior to the paper. Although the bibliography will not be graded, it must be submitted in order to receive full credit for the paper. The bibliography will help ensure you are on the right track as MANY students fail to understand the unique nature of this assignment. Additional instructions on the requirements for this paper will be posted on Blackboard around the time of the first class session.

Quiz
You will have the first 20-30 minutes of the 10/19/15 class session to complete the in-class quiz which will consist of multiple choice and short answer questions in a format similar to the homework assignments. You are allowed to use a basic calculator (no cell phones) and you may bring **one page** of prepared notes (front and back on 8 1/2 x 11 inch paper). **The quiz is worth only 5% of your grade.** It is a chance for you and the instructors to assess your knowledge of the material covered thus far and to prepare for the final exam. Often, it will help students determine whether it would be wise to begin meeting with one of the instructors to clarify unclear concepts early in the semester. **There is no make-up for this quiz**

Critique: Choose one of two published papers and use a series of guiding questions (all posted on Blackboard) to develop a 3-5 page (double spaced, 12-point font, 1 inch margins) critical analysis of the paper you have chosen.

In-Class Exam: The final exam will take place in class on Dec. 21. You will have the entire class period to complete the exam. The exam will consist of multiple choice and short answer and SPSS questions in a form similar to the homework assignments. Since you will NOT have access to a computer for you run analyses in SPSS, the SPSS output will be provided for you to interpret. You are allowed to use a calculator (no cell phones) and you may bring 1 page of prepared notes (front and back on 8 &1/2 x 11 inch paper).

Online discussion/reflections: Participation in online discussions are part of your grade. Throughout the semester, Epi-related news articles/videos and questions of interest may be posted on Blackboard. Instructors will let you know when this material has been posted. Students will be expected to post their reactions/reflections on this

Blackboard discussion board using at least 3-5 complete sentences.

Help with research and writing

Hunter College's Reading/Writing Center is available to all students for guidance on paper writing (http://rwc.hunter.cuny.edu/). The Center is located on the 68th Street Campus in Thomas Hunter Hall Room 416, phone (212) 772-4212. Students may use this and other resources in preparing written assignments. Students should feel free to discuss their homework assignments with each other and to seek assistance from others in editing their papers to refine and clarify arguments. However, the final submitted work must be written by the student herself/himself; others may NOT contribute to the assignment by writing portions of it.

While students may ask peers for feedback on written assignments and brainstorm on solutions to the homework assignments, descriptive paper and critique paper; the final version of these assignments must reflect independent work and be written in each student's own language. ***In other words, no two homework assignments or papers should ever be similar to each other.***

When working on the assignments and paper, you will need to follow these guidelines:

- All sources must be referenced and quotations identified. If there is any doubt about proper procedures, students should consult the instructors.
- If you use or paraphrase another person's ideas, you must acknowledge the source in a proper citation.
- If you use the actual words or expressions of another person or source, including the Internet, you must indicate such use by incorporation of quotation marks and a proper citation.
- You are to provide your own work, not someone else's. Examples of using someone else's work include: submitting essays or portions of essays written by other people as one's own; or collaborating with others on an assignment or examination without specific permission from the faculty member to do so.
- Students may not submit material prepared for one course to fulfill the requirements for a second course without having received prior written permission from the instructors.

Grading

The relative weight of each course component is as follows:

Assessment	Weight
HW Assignments (2/3) (See above under HW Assignments)	25%
Descriptive Epi Assignment	20%
In-Class Quiz	5%
Critique Assignment	20%
In-Class Exam	25%
Online Discussions/In-class Participation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Please check the Registrar's website for the most up-to-date information: http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%208-20-2015.pdf

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

As described above, 5% of your grade will be based on attendance and class participation. We understand that students are not able to attend all classes and we will provide recorded lectures and labs when requested to help catch up with missed material. However, the class is designed to promote discussion in a face-to-face environment and to review the material covered during the online sessions, therefore we expect students to attend the in-person sessions. Class will begin promptly to maximize our time together. Please arrive to class on time and inform instructors of unavoidable absences. Mandatory class sessions are on the quiz and final exam dates listed below because there is no make-up quiz or final exam.

Late/incomplete submission of assignments

Homework assignments and papers are due electronically on Bb on the dates listed on the Course Schedule below. If Bb is down, email the assignments to both instructors (email addresses are listed above on Page 1) and then contact Bb for assistance. Late homework assignments will have 3 out of 100 points deducted per day (including weekends) and late papers will have 1.5 out of 50 points deducted per day (including weekends). Both HWs and papers will not be accepted more than 3 days late. A zero grade will be assigned to any HW or paper that misses the deadline and, to maintain fairness among your fellow classmates, this zero grade will NOT be dropped from your overall grade.

Make-ups, rewrites, and extra credit

No make-up tests will be given if you fail to attend the in-class quiz or final exam. To maintain fairness among all students, we do not offer any or extra credit assignments to make up for a low grade or any extensions for assignments.

Expectations of students

Attend and very carefully review lectures & labs, read textbook and any articles prior to class, participate during class discussions, seek help/ask questions early and often.

Expectations for the instructors

The instructors are available during office hours and by appointment to assist students with homework, course material, exam preparation and assignments throughout the semester. The preferred method of communication with the instructors is email. Since Instructors are generally teaching more than one course and receive many email messages, **please always put your name and course number into the email header.**

We will respond to emails within 24-48 hours, excluding weekends. Generally, we will return graded assignments with feedback within two weeks.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester. The "Last Updated" Date in the header of the syllabus is meant to reference the current version of the syllabus and, therefore, should be updated if a change in schedule is made.

Please refer to the current academic calendar for important dates (holidays, course drop, withdrawal):

http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%208-20-2015.pdf

Date	Topic	Exercises	Reading & Assignments[1]
Session 1 August 31, 2015 (IN PERSON)	Introduction to Epidemiology	SPSS Exercise: Introduction to database design	Gordis, Chapter 1
Sept. 7, 2015	**No Class - Labor Day**		
Session 2 THURSDAY, Sept 10, 2015 (ONLINE) (Classes follow Monday Schedule on Thursday but class will be posted online)	Measures of Disease Occurrence Surveillance <u>Study Designs:</u> Cross-sectional study designs	SPSS Exercise: Cross-sectional study data analysis	Gordis, Chapter 3

Date	Topic	Exercises & Due Dates	Readings and Assignments[1]
Sept. 14, 2015	**No Class – Rosh Hashanah**		
Session 3 Sept. 21, 2015 (IN PERSON)	Study designs: Cohort study design (prospective & retrospective)	SPSS Exercise: Cohort study data analysis	Gordis, Chapter 9 **DRAFT BIBLIOGRAPHY (FOR PAPER 1) DUE THURSDAY, 9/24/15 AT 11:30PM**
Session 4 Sept. 28, 2015 (ONLINE)	Study designs: Case-control study design	SPSS Exercise: Case-control study data analysis	Gordis, Chapter 10 **HW1 DUE THURSDAY, 10/1/15 AT 11:30PM**
Session 5 Oct. 5, 2015 (ONLINE)	Study designs: Clinical trials (RCTs)	SPSS Exercise: RCT data analysis	Gordis, Chapters 7 & 8
Oct. 12, 2015	**No Class - Columbus Day**		
Session 6 Oct. 19, 2015 (IN PERSON) **In-Class QUIZ Today**	**In-Class Quiz TODAY** Overall Review of Cohort, Case-Control and RCT Study Designs / Related SPSS Exercises Critical Review of Epidemiologic Medical Literature (using Kendzor et al 2010 article)		Kendzor DE, et al. Financial strain and smoking cessation among racially/ethnically diverse smokers. *Am J Pub Health*. 2010;100:702-6.

Last Updated September 8, 2015

Date	Topic	Exercises & Due Dates	Readings & Assignments[1]
Session 7 Oct 26, 2015 (ONLINE)	Ecological Study Design	SPSS Exercise: Ecological Study Design data analysis	Gordis, Chapters 4 & 6 **DESCRIPTIVE EPI PAPER DUE MON, OCT. 26, 2015 AT 11:30PM**
Session 8 Nov. 2, 2015 (ONLINE)	Hypothesis Testing	SPSS Exercise: Hypothesis Testing	Gordis, Chapters 11 & 12 Goodman S. A dirty dozen: twelve p-value misconceptions. *Semin Hematol*. 2008;45:136-40 (with erratum 2011:48:302. **HW2 DUE MONDAY, NOV. 2, 2015 AT 11:30PM**
Session 9 Nov. 9, 2015 (ONLINE)	Bias & confounding	SPSS Exercise: Assessing & removing confounding through stratified analysis & MH adjusted OR	Gordis, Chapter 13 & 15
Session 10 Nov 16, 2015 (IN PERSON)	Confounding, mediation & effect modification	SPSS Exercise: Assessing mediation & effect modification in stratified analysis	Aschengrau, Chapter 14: Critical Review of Epidemiologic Studies
Session 11 Nov. 23, 2015 (ONLINE)	Measurement: reliability, internal and external validity	SPSS Exercise: Reliability and validity	Gordis, Chapter 15 **HW3 DUE SUNDAY, NOV. 29, 2015 AT 11:30PM**
Session 12 Nov. 30, 2015 (ONLINE)	Causation and risk in epidemiology	Workshop: Assessing Causality	Gordis, Chapter 14
Session 13 Dec. 7, 2015 (ONLINE)	Infectious disease epidemiology Screening	SPSS: Outbreak Analysis Screening lab/paper and pencil exercise	Gordis, chapter 2, 5 & 18 **CRITIQUE DUE THURS, DEC. 10, 2015 AT 11:30PM**

Last Updated September 8, 2015

Date	Topic	Exercises & Due Dates	Readings and Assignments[1]
Session 14 Dec. 14, 2015 (IN PERSON)	Ethics in Research	**Exam Review**	Gordis, Chapter 20 Coughlin SS. Ethical issues in epidemiologic research and public health practice. *Emerg Themes in Epidemiol.*2006, 3:16, doi:10/1186/1742-7622-3-16.
Session 15 Dec. 21, 2015 (IN PERSON) **FINAL EXAM TODAY**	**IN - PERSON FINAL EXAM** **Bring basic calculator, pencils/pens and one 8 ½ x 11 page of notes (only notes allowed).**		

[1] You are expected to complete readings in Gordis before on- or off-campus session. Supplemental readings (in italics) are extra resources and entirely optional.[1] You are expected to complete readings in Gordis before on- or off-campus session. Homework and papers must be uploaded to Blackboard by due date and time as listed on this Course Schedule above.

[2] For exam, bring a basic calculator and one 8 & 1/2x11 page of notes (front and back).

Last Updated August 20, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 75300: Principles of Epidemiology
3 Credits
Fall 2015

Time and location	Thursdays from 6:05-8:50 PM, Room 212 (lecture), then C08 (lab)
Instructors	**Heidi Jones, PhD MPH** — **Email** hjon@hunter.cuny.edu — **Phone** 212-396-7750 **Rosann Costa, MA** — rc181@columbia.edu — 212-305-9346 *e-mail is preferred method of correspondence for both instructors*
Office hours	Silberman, Room 526 Wed. 4:00-6:00 PM (except during Epi seminars) or by appointment Silberman, Room C08 Thurs, 9:00-10:00pm or by appointment
Course website	https://bbhosted.cuny.edu/webapps/blackboard/execute/announcement?method=search&context=course&course_id=_1154178_1&handle=cp_announcements&mode=cpview
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	A first-level requirement for students specializing in EPI-BIOS, who will take subsequent intermediate and advanced level epidemiology courses. It will introduce students to epidemiologic theory, principles, methods and measures commonly used in public health.
Course prerequisites	Pre-requisite or Co-requisite: PH 75100
Course format	In-person class; will generally follow the format: student questions/review *(10 minutes)*, new lecture *(60 minutes)*, break *(5 minutes)*, in-class laboratory exercise/group discussion *(90 minutes)*
Required reading and resources	Gordis L. *Epidemiology*. 4th or 5th ed. Philadelphia, PA: Saunders Elsevier, 2009 or 2013. *(on reserve at the Silberman library)* Additional assigned articles will be posted on Blackboard. Required to subscribe by email to *Morbidity and Mortality Weekly Reports*, published by the CDC: http://www.cdc.gov/mmwr/ *(no fee)*
Suggested reading and resources	Aschengrau A, Seage III GR. *Essentials of Epidemiology in Public Health*. 3rd ed. Sudbury, MA: Jones & Bartlett, 2014. Rothman K. *Epidemiology – An introduction.* New York, NY: Oxford University Press, 2002. *(Both of these texts are on reserve at the Silberman library)*

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Describe in writing the purpose of surveillance and how surveillance is used in public health practice • Explain the difference between incidence and prevalence • Describe the process of identifying and testing potential targets of intervention and give examples of effective and ineffective public health interventions • Describe the process of identifying vulnerable sub-populations, and give examples • Describe under what conditions screening is appropriate	• Homework 1-3 • Descriptive epidemiology assignment • In-class quiz • Final exam
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe epidemiological studies, including observational, quasi- experimental and experimental studies • Differentiate between primary and secondary data collection and identify possible sources of secondary data • Explain the difference between correlation and causation; risk factors/predictors and	• Homework 1-3 • Critique • In-class quiz • Final exam

	causes • Describe the causal inferences which can be made from experimental, quasi-experimental and observational studies using published examples	
Adhere to ethical and social justice principles and standards	• Describe circumstances in which an experimental study would and would not be ethical • Describe major disparities in life expectancy nationally and globally	• Homework 3 • Final exam
Interpret and analyze public health literature and apply evidence-based research	• Access and use published data to accurately describe in writing the health of populations and factors that affect health in terms of person, time and place characteristics • Distinguish between narrative and systematic reviews • Systematically review the literature on a specific topic using a PICO question	• Descriptive epidemiology assignment • Homework 1-3 • Final exam
Apply basic statistical and informatics techniques	• Explain in a few sentences the principle of screening • Define lead time and length bias and how these biases may impact screening program evaluation • Describe in a few short sentences sensitivity, specificity, positive predictive value and negative predict value of a screening test compared to a gold standard test	• Homework 1-3 • In-class quiz • Final exam

	• Calculate and interpret a mean, a proportion, a rate and an odds ratio • Explain the difference between relative and absolute risk • Calculate age-standardized rates	
Communicate public health information through oral, written, digital and visual presentation	• Describe the validity, utility and feasibility of tests used for screening and diagnosis of health conditions • Present visually information on key public health topics such as the major causes of death nationally and globally	• Descriptive epidemiology assignment • Homework 1-3 • Final exam
Design and evaluate interventions to prevent or control public health problems	• List the strengths and weaknesses of different techniques for evaluating interventions • List the strengths and weaknesses of different techniques for controlling public health problems	• Homework 1-3 • Critique • Final exam
Collect, analyze and interpret public health data	• Explain how to choose and apply appropriate study designs to answer a research question • Explain the interpretation of different measures of population health, such as life expectancy, quality adjusted life years	• Homework 1-3 • Descriptive epidemiology assignment • Critique • Final exam

Course Assessments

Homework assignments

Each of the 3 homework assignments to complete over the semester will include multiple choice, short answer and SPSS questions. **The final homework grade will be based on the highest 2 grades of the 3 assignments ONLY if all 3 assignments have been fully completed and submitted by the due date, including the SPSS section.**

SPSS will be used in class and will be required for parts of each of the three homework assignments. The Hunter College license covers only on-campus use. The SPSS software is available for student use in the library and in computer labs at multiple Hunter campuses. Please be sure to look into the days and hours of access. Students who wish to purchase a student copy of SPSS can do so at www.onthehub.com. ***SPSS Statistics Base GradPack 23* for 6 months (Mac or Windows) for approximately $40 will suffice for this course. The exact link is:**
https://estore.onthehub.com/WebStore/OfferingsOfMajorVersionList.aspx?pmv=89cf975c-47c3-e411-940a-b8ca3a5db7a1&cmi_mnuMain=ed6ad73c-7bc7-e011-ae14-f04da23e67f6

Purchasing SPSS is NOT required for this course as long as you can regularly access the library and/or computer labs to complete the SPSS-related HW sections. You will NOT need to have SPSS on your personal computer in order to view the online SPSS lab exercise but you will definitely need SPSS access to complete the HWs.

Descriptive epidemiology assignment

Conduct a literature search on one health condition of your choice and write a 3-4 page paper (double spaced, 12-point font, 1 inch margins) describing the epidemiology of this condition in terms of person, place and time. You must include at least 10 citations from the public health literature (peer-reviewed journals).

An ungraded bibliography will be due three weeks prior to the paper on which the instructor will provide feedback. Although the bibliography will not be graded it must be submitted on the due date to avoid losing points on the paper. Additional instructions on the requirements for this paper will be posted on Blackboard. **Please note, we will use software to detect plagiarism (TurnItIn) to scan your paper**. Please be sure to appropriately write in your own words and cite the work of other authors.

In-Class Quiz

There is no opportunity for a make-up quiz. You will have the first 20 minutes of class to complete the quiz on the date listed on the Course Schedule below. It will consist of multiple-choice and short answer questions in a format similar to the homework assignments. You are allowed to use a calculator and you may bring **1 page** of prepared notes (front and back on 8 1/2 x 11 inch paper). **The quiz is worth only 5% of your grade.** It is a chance for you and the instructors to assess your knowledge of the material covered thus far and to prepare for the final exam. Often, it will help students determine whether it would be wise to begin meeting with an instructor to

clarify unclear concepts early on in the semester.

Critique
Choose one of two published papers posted on Blackboard. Use a series of guiding questions also posted on Blackboard to develop a 4-6 page (double spaced, 12-point font, 1 inch margins) critical analysis of the paper you have chosen.

Final in-class exam
There is no opportunity for a make-up final exam. You will have the entire class period to complete the in-class exam on the date listed on the Course Schedule below. The exam will consist of multiple-choice, short answer and SPSS interpretation questions in a form similar to the homework assignments. You are allowed to use a calculator (no cell phones) and **one page** of prepared notes (front and back on 8 1/2 x 11 inch paper).

Attendance and class participation
The reading assignments will help you master course materials and actively participate in class. As they are not long, **you are expected to complete all of the required reading assignments**; 5% of your grade will be based on your class participation and attendance as outlined in the following rubric:

Class participation grading rubric (5% of your grade, perfect score=12)*

	Strong work (3)	Needs development (2)	Unsatisfactory (1)
Active listening (3 points)	Actively and respectfully listens to peers and instructors; consistently engaged and focused.	Sometimes displays lack of interest; not entirely engaged throughout the session; occasionally checks email, instant/text messages or other non-course material during class time.	Projects lack of interest during class; apparent visible clues that s/he is not listening to peers or instructors; frequently checks email, instant/text messages or other non-course internet material during class time.
Preparation (3 points)	Arrives to class with questions about reading assignments; active involvement in the journal article breakout sessions, clearly demonstrating that s/he has read/thought about the material	Sometimes arrives unprepared or with only superficial preparation for the journal article breakout sessions	Exhibits little evidence of having read or thought about assigned material
Quality of contributions to class discussions (3 points)	Comments and asks pertinent questions frequently. Expresses thoughts clearly.	Comments and questions sometimes advance the discussion, but sometimes do little	Thoughts are not expressed clearly; comments are often off topic; or student does

		to move it forward	not participate in class discussions
Attendance (3 points)	Arrives to class on time, does not have unexcused absences, and absent ≤ 2 times	Usually arrives to class on time; absent ≤ 2 times, but only sometimes informs instructors about unavoidable absences.	Arrives consistently late, and/or does not inform instructors about absences, or absent > 2 times.

* adapted from: http://www46.homepage.villanova.edu/john.immerwahr/TP101/EvDay/discussion%20rubric.pdf. Accessed on July 21, 2010

Grading

Evaluation criteria

Your understanding of the course material will be evaluated through three homework assignments, a descriptive epidemiology assignment, a critique, an in-class mid-semester quiz, an in-class final exam, and class participation/attendance. Rubrics will be used to grade the written assignments.

The relative weight of each course component is as follows:

Assessment	**Weight**
Homework assignments (2/3)[1]	25%
Descriptive epidemiology assignment	20%
Critique paper	20%
In-class quiz	5%
In-class final exam	25%
Class participation / attendance	5%
	100%

[1] We will take the average score of your top two scores on the homework assignments, provided you have submitted three **fully completed** assignments by the due date (including the SPSS portion). If you do not submit an assignmen, a grade of 0 will be included in the calculation for the average overall HW grade.

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
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F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

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As described above, 5% of your grade will be based on attendance and class participation. We understand that students are not able to attend all classes and will record lectures and labs to help with catching up on missing material. However, the class is designed to promote discussion in a face-to-face environment; therefore we expect students to attend in person. Further, class will begin promptly to maximize our time together. Please arrive to class on time and inform instructors of unavoidable absences.

Late/incomplete submission of assignments

Homework assignments and papers are due electronically at 5:30 PM, prior to the beginning of class. Refer to the Course Schedule below for specific dates. Late homework assignments will have 4 out of 100 points deducted per day (including weekends) and late papers will have 2 out of 50 points deducted per day (including weekends). Both HWs and papers will not be accepted more than 3 days late (i.e. no later than end of day Sunday).

Make-ups, rewrites, and extra credit

No make-up tests will be given if you fail to attend the in-class quiz or final exam. To maintain fairness among all students, we do not offer any extra credit assignments to make up for a low grade. If you keep up with both the lectures and the labs, and ask questions, you will likely do very well in this course.

Expectations of students

Attend lectures & labs, read textbook and articles prior to class, participate during class discussions, seek help/ask questions early and often, provide the instructor with constructive feedback on course material and content, and have fun with the material.

Expectations for the instructors

We will respond to emails within 24-48 hours, excluding weekends. We will tailor the class to your needs and interests depending on the feedback we receive. Generally, we will return graded homework assignments and papers within two weeks, with the exception of the draft bibliography which will be returned with feedback within approximately one week.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructors know at the beginning of the semester if you require special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

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Course Schedule

Please note, while the overall content of this course will be covered as outlined, the syllabus may change based on the need to adapt to student interests, feedback and expertise. Always check the Blackboard site for the most up-to-date information on course readings and assignments.

	Date	Topic	Workshops/Exercises (Using calculator and SPSS)	Readings and Assignments
1	08/27/15	Introduction to epidemiology	Introduction to database design	Gordis, chapter 1
2	09/03/15	Measures of morbidity and mortality Study design: cross-sectional	Analyze and interpret cross-sectional study data	Gordis, chapter 3 & 4
	09/10/15	*No class – follows Monday schedule*		
3	09/17/15	Study design: cohort	Group discussion - critique Grodstein et al. paper Analyze and interpret cohort study data	Gordis, Chapter 9 Grodstein et al. A prospective, observational study of postmenopausal hormone therapy and primary prevention of CVD. *Ann Int Med*. 2000;133:933-41 **(with discussion questions)** **Bibliography for descriptive epidemiology assignment due at 5:30 PM**
4	09/24/15	Study design: case control	Group discussion - critique Windler et al. paper Analyze and interpret case control study data	Gordis, Chapter 10 Windler et al. Hormone replacement therapy and risk for CHD: data from the CORA study-a case-control study on women with incident CHD. *Maturitas* 2007;239-46. **(with discussion questions)** **HW 1 due at 5:30 PM**

	Date	Topic	Workshops/Exercises (Using calculator and SPSS)	Readings and Assignments
5	10/01/15	Surveillance, Age standardization Study designs: Ecological & Mendelian randomization	Direct age standardization Analyze and interpret ecological study data	Lee LM & Thacker SB. The cornerstone of public health practice: public health surveillance, 1961-2011. *MMWR*. 2011:15-21 Tu JV & DT Ko. Ecological studies and cardiovascular outcomes research. *Circulation*. 2008. 118:2588-93.
6	10/08/15	Study design: clinical trials	Group discussion - critique WHI paper Analyze and interpret clinical trial data	Gordis, Chapters 7 & 8 Women's Health Initiative (WHI). Effects of conjugated equine estrogen in postmenopausal women with hysterectomy: the Women's Health Initiative RCT. *JAMA.* 2004;291:1701-12. **(with discussion questions)** **Descriptive epidemiology assignment due at 5:30 PM**
7	10/15/15	**IN-CLASS QUIZ** Infectious disease epidemiology	Implementing an outbreak investigation	Gordis, chapter 2 Yeung SLA et al. Moderate alcohol use and cardiovascular disease from Mendelian Randomization. *PLoS One.* 8:e68054.
8	10/22/15	Critical reading of epidemiologic literature Hypothesis testing	Dissecting an article using Kendzor et al. article	Gordis, Chapters 11 & 12 Goodman S. A dirty dozen: twelve p-value misconceptions. *Semin Hematol*. 2008;45:136-40 (with erratum 2011:48:302. Kendzor DE, et al. Financial strain and smoking cessation among racially/ethnically diverse smokers. *Am J Pub Health*. 2010;100:702-6. **HW 2 due at 5:30 PM**
9	10/29/15	Selection bias, colliders & confounding	Stratified analysis to test for confounding (MH OR) and interpreting 95% CIs	Gordis, Chapter 13 & 15 Schooling et al. Selection bias in cohorts of cases. *Prev Med* 2013:247-8.

	Date	Topic	Workshops/Exercises (Using calculator and SPSS)	Readings and Assignments
10	11/05/15	Mediation & effect measure modification	Stratified analysis to test for mediation (MH OR) and effect modification (Breslow-Day test)	Aschengrau, Chapter 14: Critical Review of Epidemiologic Studies
11	11/12/15	Information bias: validity and reliability	Calculate validity (sensitivity/specificity) of a measure and reliability (kappa)	Gordis, Chapter 15
12	11/19/15	Screening	Assess how well a screening test performs	Gordis, Chapters 5 & 18 **HW 3 due at 5:30 PM**
	11/26/15	No class – Happy Thanksgiving!		
13	12/03/15	Causation	SPSS review	Gordis, Chapter 14 **Critique due at 5:30 PM**
14	12/10/15	Ethics	Exam review	Gordis, Chapter 20 Shaw DM. Beyond conflicts of interest: disclosing medical biases. *JAMA*. 2014:697-8.
15	12/17/15	**Final Exam** (in class) Bring calculator, pencil/pen and one 8 ½ x 11 page of notes (only notes allowed).		

For additional information on the academic calendar, please see:
http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%205-27-15.pdf

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College

PH 754 Fundamentals of Environmental Health

3 Credits - Fall 2015

Time and location	Online asynchronous course. Lessons launched every Monday 9:00 am regardless of holidays
Instructor	Jack Caravanos, DrPH, CIH Professor, CUNY School of Public Health 2180 3rd Ave, Room 720 Phone 212-396-7780 jcaravan@hunter.cuny.edu
Office hours	Online and Thursday 4-6 pm in my office
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Survey of chemical, physical and biological factors influencing quality of ambient, workplace and home environments. Topics include: air and water pollution; radiation; hazardous substances; solid wastes; food protection; and natural and human-made disasters.
Course prerequisites	None
Course format	This course is taught completely online asynchronously with lessons launched weekly. Each lesson consists of 3-6 learning modules in video format. Interspersed between these videos are quizzes, assignments and readings. In addition, 6 synchronous evening sessions are scheduled. Synchronous meetings are recorded. This is not a self-paced course; there are weekly deadlines for discussion and activities.
Required Reading	• Our Global Environment: A Health Perspective, Anne Nadakavukaren, 7th Edition, Waveland Press, ISBN-13: 978-1577666868 (available online as hardcopy or eTextbook) • A Civil Action – Jonathan Harr, Vintage Press (non-fiction paperback available online)
Suggested reading and resources	Posted online as needed.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Describe approaches for identifying and assessing the human and ecological impacts of workplace, community, and residential environmental hazards	• Assignments, online quizzes and in section exam
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Explain the importance of working collaboratively with diverse communities, sectors, and constituencies in the development, implementation, and evaluation of workplace and environmental health programs and policies. • Describe the elements, appropriate use and limitations of key risk assessment, risk management and risk communication strategies	• Online quizzes and in section exam
Apply basic statistical and informatics techniques	• Use informatics techniques to retrieve, analyze and summarize environmental health data • Use spreadsheet applications to collect, conduct descriptive analyses, and graphically represent data	• Environmental data project, online assignments
Communicate public health information through oral, written, digital and visual presentation	• Construct a multimedia learning module on an environmental topic using published data	• Environmental data project
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Understand the basic mechanisms of toxicity and pathobiology • Achieve a basic understanding of how genetic, physiologic, psychosocial factors influence susceptibility to adverse health outcomes following exposure to workplace, community, and residential environmental hazards • Identify the major types and sources of environmental agents that can impact health in workplace, urban community and residential settings. • Describe the pathways by which major environmental agents cause human exposure in workplace, urban community and residential settings. • Explain the reasons, sources, and impacts of inequitable distribution of environmental hazards	• Assignments, online quizzes and in section exam
Design and evaluate interventions to prevent or control public health problems	• Describe basic concepts and strategies for controlling environmental hazards in workplace, community, and residential settings and the advantages and limitations of	• Assignments, online quizzes
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Identify the major provisions, accomplishments and limitations of key environmental and occupational regulatory programs, guidelines, and authorities at the federal, state and local level.	• Online quizzes and in section exam

Course Assessments

Details about the assignments can be found on the course website as lessons are presented. There are 3 exams based on 4-5 lessons and 6 quizzes based on short environmental presentations usually of historical value.

Environmental Data Project:

On the first day of class you will be given an environmental topic to research. Each student must assemble tabular and graphical data on this topic and submit an interpretation through a narrated PowerPoint presentation. The format of the presentation should be 5 tables, figures, graphs with a written paragraph describing the findings. Grading will be based on format, quality of graphs and data representation, organization and effectiveness of presentation. Use PPTs "narration" feature to record your presentation. You will submit this through BB as either a narrated PPT or common video file (MP4, WMV or QuickTime)

The assignment must include (in this order):

- Title Slide (include name, course information, date)
- Purpose/Objectives slide
- Table of Contents slide
- The 5 Tables, Figures, Illustrations etc
- Summary Slide
- Professional style reference list

The presentation must proceed from general to specific and should temporal and spatial variables. Do not use all graphs or all figures (variety is desired).

For example let's say your topic was "Environmental Asthma"; here are 5 appropriate tables/graphs:

1. Table of Environmental Asthma triggers
2. Figure of Asthma rates for entire US (color coded?)
3. Graph or table of Asthma rates in NYC by borough
4. Graph or table of Asthma rates in NYC by year (1990-2003)
5. Graph or table of Asthma rates in NYC by who is affected (gender, ethnicity, age)

Grading Criteria for Course

Exam 1,2,3	3	18%	54%
Quizzes 1-6	6	5%	30%
Data Assignment	1	10%	10%
In Line Assessments	12	0.5%	6%
			100%

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
This is a fully online course and attendance is not recorded. The synchronous (live) sessions are strongly recommended and students will be responsible for comments or notices made in these sessions. Each synchronous session is recorded for future viewing in the event you cannot attend the live sessions.

Late/incomplete submission of assignments
Late or incomplete assignments are accepted with penalty unless approved by instructor.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students
- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion and online forums.
- Complete all assignments by their assigned due date (10% penalty per week late will be applied)
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor
- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours
- Grading and feedback on assignments (when applicable) within 1 week after the due date.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

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Course Schedule
Refer to the current academic calendar for important dates.

Class	Date	Topic	Readings
Pre		Understanding BB, Reviewing site Practice Quiz	BB Online Student Resources
1	Aug 31	Course Welcome / Introduction to Env Health / Environmental Controls	Chp 1, p2-5, Chp 2, p33-54, Box 1-4 www.epa.gov, www.cdc.gov/atsdr
2	Sept 7	Environmental Law / National Env Policy Act of 1969	Start reading "A Civil Action" www.epa.gov/lawsregs/
		Quiz: Lake Nyos (due by Exam 1)	
	Sept 10	Synchronous Meeting #1 10:00 – 10:30 pm	
3	Sept 14	Hazard Identification, Evaluation and Control	Chapter 7, p155-158
4	Sept 21	Environmental Toxicology / Public Health Biology / Human Disease	Chapters 6 & 7, Box 6-3 and 6-4 www.cdc.gov/atsdr, http://toxtown.nlm.nih.gov/
		Quiz: Minamata Disease (due by Exam 1)	
	Sept 24	Synchronous Meeting #2 10:00 – 10:30 pm	
5	Sept 28	**EXAMINATION #1**	Lessons 1-4, 2 quizzes & Civil Action p0-146
6	Oct 5	Sustainability /Green Buildings / Climate Change	Chp 1 p12, Chp 12, p 281-322 www.epa.gov/climatechange,www.usgbc.org
7	Oct 12	Air Pollution and Health / IAQ	Chapter 13, Box 13-3, 13-6 www.epa.gov/air www.who.int/phe/health_topics
		Quiz: Gauley Bridge (due by Exam 2)	
	Oct 15	Synchronous Meeting #3 10:00 – 10:30 pm	
8	Oct 19	Water Supply and Health	Chapter 15 (all), Box 15-2 www.epa.gov/water www.who.int/phe/health_topics
9	Oct 26	Water Pollution and Health	Chapter 16, Box 16-2, 16-5, www.water.epa.gov/polwaste/wastewater/ www.who.int/phe/health_topics
		Quiz: Queens Aquifer (due by Exam 2)	
	Oct 29	Synchronous Meeting #4 10:00 – 10:30 pm	
10	Nov 2	**EXAMINATION #2**	Lessons 5-8, 2 quizzes & Civil Action p147-376
11	Nov 9	Food Contaminants and Safety	Chapter 9, Box 9-5 www.fda.gov/Food/FoodSafety
	Nov 12	Synchronous Meeting #5 10:00 – 10:30 pm	
12	Nov 16	Consumer Product Safety and Safety Engineering	No readings in textbook. www.osha.gov, www.cdc.gov/injury/wisqars/, www.cpsc.gov
		Quiz: Filthy Cities (due by Exam 3)	
13	Nov 23	Land Contamination (Solid and Hazardous Wastes)	Chapter 17, www.epa.gov/solidwaste www.epa.gov/superfund
14	Nov 30	Noise Hazards: Community and Workplace Radiation Hazards / Power Plants	Chapter 14 Noise and Chapter 10 Radiation
		Quiz: Love Canal (due by Exam 3)	
	Dec 3	Synchronous Meeting #6 10:00 – 10:30 pm	
15	Dec 7	**EXAMINATION #3**	Lessons 9-12, 2 quizzes & Civil Action p380-494

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 754 Fundamentals of Environmental Health

3 Credits
Fall 2015

Time and location	Thursday 6:05- 7:55pm Silberman Building, Room 218
Instructor	Elizabeth Glass Geltman Associate Professor & Program Director, Environmental & Occupational Health Sciences 2180 Third Avenue, Office 524 Phone: 202-320-4520 Email: elizabeth.geltman@hunter.cuny.edu
Office hours	Thursdays** from 4-5:45pm (when school is in session) & by appointment. **Note: There are no walk-in office hours on "online" weeks, holidays or when school is not in session.
Course website	BlackBoard
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Survey of chemical, physical and biological factors influencing quality of ambient, workplace and home environments. Topics include: air and water pollution; radiation; hazardous substances; solid wastes; food protection; and natural and human-made disasters.
Course prerequisites	None
Course format	Traditional with web enhancements.
Required reading and resources	Friis, Robert H. Friis, **ESSENTIALS OF ENVIRONMENTAL HEALTH** (Jones & Bartlett Learning, 2nd ed. 2012). Materials Posted on BLackBoard.
Suggested reading and resources	None

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Describe approaches for identifying and assessing the human and ecological impacts of workplace, community, and residential environmental hazards	• Group Research Modules • Class participation • Exam
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Explain the importance of working collaboratively with diverse communities, sectors, and constituencies in the development, implementation, and evaluation of workplace and environmental health programs and policies. • Describe the elements, appropriate use and limitations of key risk assessment, risk management and risk communication strategies	• Group Research Modules • Class participation
Apply basic statistical and informatics techniques	• Use informatics techniques to retrieve, analyze and summarize environmental health data • Use spreadsheet applications to collect, conduct descriptive analyses, and graphically represent data	• Internet assignments • Class participation
Communicate public health information through oral, written, digital and visual presentation	• Draft a white paper • Construct a website • Draft a blog entry or press release summarizing material in white paper • Draft a tweet summarizing material in white paper • Make a formal presentation on an environmental health topic using presentation software • Make informal presentations about current events concerning environmental health	• Group Research Modules • Current Events • Class participation • Exam
Explain how social, behavioral, biomedical and environmental	• Understand the basic mechanisms of toxicity and pathobiology	• Group Research Modules • Exam

determinants affect population health	• Achieve a basic understanding of how genetic, physiologic, psychosocial factors influence susceptibility to adverse health outcomes following exposure to workplace, community, and residential environmental hazards • Identify the major types and sources of environmental agents that can impact health in workplace, urban community and residential settings. • Describe the pathways by which major environmental agents cause human exposure in workplace, urban community and residential settings. • Explain the reasons, sources, and impacts of inequitable distribution of environmental hazards	• Class participation
Design and evaluate interventions to prevent or control public health problems	• Describe basic concepts and strategies for controlling environmental hazards in workplace, community, and residential settings and the advantages and limitations of	• Group Research Modules • Current Events • Class participation • Exam
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Identify the major provisions, accomplishments and limitations of key environmental and occupational regulatory programs, guidelines, and authorities at the federal, state and local level.	• Group Research Modules • Class participation

Course Assessments
Your understanding of the course material will be evaluated through a series of 10 internet assignments, a series of 14 group research modules, class participation both in class and online on the discussion board and a final exam. Each are discussed in detail below.

Internet Database Assignments (Int)

20 points

There are a series of 10 brief internet related research assignments that are designed to: (1) improve your internet searching skills, (2) introduce you to important sites containing information on the internet; (3) allow you to identify and explore various databases and public sources of information valuable in the environmental and occupational health and (4) aid in your understanding of environmental health and environmental protection programs.

The assignments generally involve searching an environmental or public health web site for specific information. Once found, you must submit your answers in the space provided on BLACKBOARD.

Internet assignments are graded on a pass/fail scale using the following formula:

Pass (2 points)—on time & 75% or more correct & posted as instructed on BLACKBOARD

Low Pass (1 point)—no more than 3 days late or 25% to 75% correct & posted as instructed on BLACKBOARD

Fail (0 points) – not turned in, more than 3 days late, less than 25% correct or not posted as instructed on BLACKBOARD

Group Research Assignments (RM)

40 points

The group assignment requires students to work together through a series of research assignments culminating in both written work product and an oral presentation. The group assignments are designed to both refine research skills and allow students to explore one aspect of environmental and occupational health in depth. Although students will work together in groups through most of the modules, including the white paper. The press release and/or blog entry (and tweet) in GM12 will be done individually. Students will select one of the following groups:

- Group 1: Arsenic, inorganic
- Group 2: Chromium VI
- Group 3: Ethylbenzene
- Group 4: Napthalene
- Group 5: Phthalates
  - Butyl benzyl phthalate (BBP)
  - Dibutyl phthalate (DBP)
  - Diethyl phthalate (DEP)
  - Diisononyl phthalate (DINP)
- Group 6: Polychlorinated Biphenyls (PCBs)
- Group 7: Formaldehyde

Groups may have no less than 4 and no more than 6 students in each group.

*DUE DATES for research modules are based on class progress. Tentative due dates for all research modules are posted on this syllabus and on BLACKBOARD (in the Term Paper/ Group Research Modules tab), but may be changed based on class need. Due dates will not be changed to proceed the dates published below. All changes (in the form of extensions) will be announced in class and amended on BLACKBOARD.

Research Module (RM) #	**Description**	**Due Date**	**Rubric**	**Points** **40 Total**
RM1	Select a group Go to Group Module (GM) folder on BlackBoard (BB) and self enroll in one of the groups listed above. Hint: Click the links above to explore material provided by US EPA on the topics to help you decide. Complete the research software skills survey at https://www.surveymonkey.com/r/6WS7WGG	8/27/15		1
RM 2	Quick Literature Review: Use the Wiki form to conduct quick search of peer-reviewed health studies	9/3/15	Click this link and go to the RM Folder	1

	on your topic. The wiki will help your group keep track of searched when drafting group quick lit. The form requires group members to record: the database searched; the search term(s); the date the search was run; and the search results. Use the wiki to coordinate your group efforts during the week. Submit a list of peer-reviewed literature on your topic using this link.		for Quick Lit Rubric	
RM3	Summarize the problem: Go to the EPA IRIS website at http://www.epa.gov/iris/ and review the materials US EPA published concerning your topic. Next review the public comments in docket on http://regulations.gov, including: Scientific community; Industry; Academics; NGOs. Summarize the materials.	9/17/15	Click this link for Summary Rubric	1
RM4	Create a table identifying areas in need of research and or law/regulation, if any Use the wiki on the DB to list areas in need of further research and/or policy changes that protect health. This table should be used for group brainstorming; there are no right or wrong suggestions, but all should be thoughtful and realistic.	9/24/15	Click this link for Policy Rubric	1
RM5	Conduct an interview of an expert: Develop a set of questions prior to your interview and record those on the DB. Remember to request permission to record and use the interview from your	10/1/15	Click this link for Expert Interview Rubric	1

	interviewee.			
RM6	Identify data sets, if any, associated with your topic Post link(s) to the datasets on the wiki with a brief explanation of why the dataset is important/relevant.	10/8/15	Click this link for Expert Data Set Rubric	1
RM7	Write the white paper: The white paper must include the following sections: Introduction; Research methods; Discussion & analysis, including a summary of EPA published materials; Conclusions & policy recommendations; Works Cited Turn in draft white paper to peer reviewers pursuant to the list posted. For a list of tips on graduate writing click here or copy and past this link: https://www.brown.edu/about/administration/sheridan-center/teaching-learning/resources-students/scientific-writing-skills	10/15/15	Click this link for White Paper Rubric	1
RM8	First Peer Review Peer review the papers using the assessment form and grading rubric. Each group will be assigned to peer review the works of two other groups selected at random. So each student will peer review two papers. Students should *individually* peer review the two papers; as such, each group will have its white paper separately reviewed by 8 to 12 individuals.	10/22/15	Click this link and go to the RM Folder for Peer Review Rubric & Assessment Form	1
RM9	Create a webpage	10/29/15	Click this link and	8

	The web page must include: a home page with introduction; a reference list with hot links; a summary or recording of the expert interview; a summary of EPA published materials with hot links to relevant EPAIRIS pages/ documents; and the policy recommendations of your group. There are many free sites to build a website, including: https://wordpress.com/ http://www.wix.com/ http://www.weebly.com		go to the RM Folder for Webpage Rubric	
RM10	Create a 10 minute presentation All group members must participate. The presentation must include the following sections: Introduction; Research methods; Discussion & analysis, including a summary of EPA published materials; Conclusions & policy recommendation; Reference list	12/3/15 & 12/10/15	Click this link and go to the RM Folder for Presentation Rubric	8
RM11	Write a white paper: Final Paper: Make edits based on peer reviews.	11/12/15	Click this link and go to the RM Folder for White Paper Rubric	8
RM12	Write a press release or blog entry summarizing your study. Write sample tweet that could be used on https://twitter.com/ Once your group has completed its study you need to get the word out. Your final task is to compose a press release or blog entry (and a tweet) explaining	11/19/15	Click these links and go to the RM Folder for Blog, Press Release & Tweet	5

	your study and why it is important. Post your entry in the Group Module folder on BB.		Rubrics	
RM13	Create student aids Write an exam review sheet and an exam question(s). Bonus points for creating a set of flash cards on https://quizlet.com/class/1687605/ for your peers to use to study.	12/3/15	Click this link and go to the RM Folder for Review Sheet Rubric	2
RM14	Complete 2nd peer & self review	12/10/15	Click this link and go to the RM Folder for 2nd peer & self review Rubric	1

All assignments must be posted on BLACKBOARD with a paper confirmation copy turned in at the beginning of class. Each student should post a copy of the assignment but the group may turn in one paper confirmation copy. **No assignments will be accepted by email without prior written approval.** Attachments must be named according to the instructions below.

Naming files when turning in assignments

Many internet and group assignments will be turned in using a wiki, discussion board or by pasting the answer into a text box when submitting. In general, internet and group assignments should not be submitted as an attachment unless the instructions specifically request such.

For all assignments posted on BLACKBOARD as an attachment, the file must be named using the following formula:

PH754_F15_StudentLastName_StudentFirstName_Date_INT#

For all group assignments posted on BLACKBOARD as an attachment must be named using the following formula:

PH754_F15_Group#_ StudentLastName_StudentFirstName_Date_RM#

Assignments will not be graded for students or groups not naming files according to instructions.

Attendance, class participation (14pts) & current events (CEs) (6pts)

20 points

Class attendance is taken every day. Students must sign in at the beginning of class.

Students are expected to bring current event discussion items to class at least three times during the semester. Up to 2 points will be earned for each time the student presents a current event for up to 6 points. The current events should pertain to the topic scheduled for that evening.

Students must sign up for the three sessions by the second week of class. Students are expected to attend and lead the current events portion of the class on the date the student selects -- so select with care and notify the instructor in advance should plans change.

Students should post a link to the presented current event on the discussion board after class; thus, allowing interested students the ability to read the original article that prompted the discussion.

In addition, up to 14 points are awarded for class participation, which begins with attendance. Students who are not in attendance are, by definition, not participating on that day. Students are expected to read assignments prior to class and engage in discussion during class (whether or not the student signed up to report current events and “lead” the discussion that week).

Reading Assignments

Class lectures build on (but do not review) the reading. Students who do not keep up with the reading will be disadvantaged both in class and on the exam.

The relative weight of each course component is as follows:

Assessment	Weight
Research Modules	40%
Internet Assignments	20%
Class	20%

participation & Current Events	
Final Exam	20%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Lateness

Be respectful and enter the room quietly. Remember to sign the attendance sheet.

Late submission of assignments

All papers and assignments are due at the beginning of class at 6:00pm. Papers turned in after the beginning of class are considered late.

No papers or assignments will be accepted after the instructor has released answers and/or returned graded work to the class. Once work is returned to the class, the link to the assignment will expire on BLACKBOARD.

All papers must be turned in on BLACKBOARD, with a paper confirmation copy turned in at the beginning of class on the date due. Papers that are submitted without a paper confirmation copy or that are not also posted on BLACKBOARD are considered late unless prior written approval is received from the instructor. Each it is the responsibility of each student to post his or her own assignments on time, even when the assignment is done in a group.

No papers, internet assignments or other homework will be accepted by email unless prior written arrangements are made with the instructor. Attachments must be named according to the instructions stipulated in this syllabus.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit assignments in this course. Late assignments hold the entire class up and can delay return of graded assignments. Plan to do your best work and turn your work in on time.

Expectations of students

Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.

Know how to use library resources and citation tools.

Show respect to everyone in the course.

Be prepared to actively participate in class.

Turn work in on time at the beginning of class and on BLACKBOARD prior to the start of class.

Sign the attendance sheet at the beginning of class each week.

Respond to group members in a prompt and courteous manner.

Reframe from using electronic devices in class, including **mobile phones, tablets, and computers.** Students should be prepared to take notes using paper and pencil, unless special circumstances prevail and prior arrangements are made with the instructor. **Students violating this policy (including texting) will be asked to leave the classroom.** Class participation points will be deducted for students engaged in telephone or online activities during class.

Expectations for the instructor
Provide regular announcements, reminders, and suggestions on the course website.

Meet with students during office hours or by appointment.

Respond to email within 24 to 48 business hours.
Note: I am available by email at mailto:elizabeth.geltman@hunter.cuny.edu and by telephone at 202-320-4520 **during business hours** to answer questions. I am not available after 8pm weekdays, on weekends or on school holidays. Please do not abuse the email privilege. Consult the syllabus, BLACKBOARD, and other course materials first for answers to your questions.

Return graded work within 1 week after the due date or receipt by the student.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity
Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the

CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

This syllabus is a guide for the course and is subject to change with advance notice. Any changes in the course syllabus will be announced during class and will be posted as an announcement on Blackboard ("BB.") No changes will be made to the grading criteria.

Refer to the current academic calendar for important dates.

Week	Date	Topic	Reading	Assignments
1	8/27/15	Introduction to EOHS / Environmental History and Law	Friis, Essentials of Environmental Health, Chapters 1 & 4	RM1: Select a group Int1: Get to Know You Wiki
2	9/3/15	Hazard Recognition / Environmental Toxicology / Risk Assessment	Friis, Chapters 2 & 3	RM2: QuickLit Int2
3	9/10/15 No Class	Classes follow a Monday Schedule		
4	9/17/15	Solid & Hazardous Wastes	Friis, Chapters 6 & 12	RM3: Summarize EPA documents Int3
5	9/24/15 Online Class No F2F Meeting	Solid & Hazardous Wastes	Friis, Chapters 6 & 12	RM4: Table of research, policy needed Int4
6	10/1/15	Pesticides Zoonotic & Vector-Borne Diseases	Friis, Chapters 5 &	RM5: Expert interview Int5

7	10/8/15	Pesticides Zoonotic & Vector-Borne Diseases	Friis, Chapters 5 & 7	RM6: Identify data sets Int6
8	10/15/15	Water Quality	Friis, Chapter 9	RM7: Write white paper
9	10/22/15	Air Quality	Friis, Chapter 10	RM8: Peer review white paper
10	10/29/15	Food Safety	Friis, Chapter 11	RM9: Create web page Int7
11	11/5/15	Energy Production & Health	Friis, Chapter 14	Int8
12	11/12/15	Climate Change	Friis, Chapter 11 & 13 Friis, Chapter 8, p. 185	RM11: Revised white paper
13	11/19/15	Future of Environmental Health		RM12: Write a press release or blog + tweet Int 9
14	11/26/15 No Class	Thanksgiving		
15	12/3/15	**Paper Presentations & discussion**		RM10 & 13: Presentation, Exam Q & Study Aids Int10
16	12/10/15	**Paper Presentations & discussion**		RM10 &13: Presentation, Exam Q & Study Aids

17	12/17/15 No F2F Meeting	**Exam ONLINE**		RM14: 2nd Peer & Self Review

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 75500.01: Fundamentals of Social and Behavioral Health (Hybrid)
3 Credits
Fall 2015

Time and location	Tuesdays, 8:00—9:50PM, Silberman 214
Instructor	Dr. Lynn Roberts, PhD Office: Silberman Room 530 e-mail: lroberts@hunter.cuny.edu (preferred contact) phone: (212) 396-7742
Office hours	Wednesdays 4-6 PM and by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course provides a topical and theoretical survey of social and behavioral issues in public health.
Course prerequisites	N/A
Course format	This course is taught in a HYBRID format with a mix of online learning resources, in class discussion, lecture, individual and collaborative exercises and assignments. All materials are available on the course website. This is not a self-paced course; there are weekly deadlines for discussion and activities.
Required reading and resources	Freudenberg N, Galea S and Vlahov D (eds.) Cities and the Health of the Public, Nashville, TN: Vanderbilt University Press, 2006, ISBN: 08265-1512-6.
Suggested reading and resources	Farley T, Cohen DA *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005. ISBN: 0-8070-2117-2

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Summarize the history and evolution of the field of social and behavioral health. • State the difference across primary, secondary and tertiary prevention.	• Class discussion
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Compare and contrast different models and theories, including the health belief model, social cognitive theory, community organizational theories, the socio-ecological model, and systems science, with regard to social and behavioral change. • Describe how health and disease are socially constructed. • Summarize basic principles and methods of effective health communication and social marketing to create social and behavioral change. • Summarize the theory of diffusion of innovation. • Justify the relevance of at least one theory from fields others than public health that may inform solutions for a public health problem.	• Class discussion • Course Blog • Public Health Brief • Collaborative Public Health Lit Review
Adhere to ethical and social justice principles and standards	• Relate contemporary public health problems to power and resource distribution, equity, diversity, sustainability, and intended and unintended consequences of interventions.	• Class discussion • Course Blog
Interpret and analyze public health literature and apply evidence-based	• Conduct a comprehensive literature search and compile the results thereof on a given social and behavioral health issue. • Critique the merits and limitations of a scientific	• Public Health Brief • Collaborative Public Health Lit Review

research	article with relevance to social and behavioral health.	
Communicate public health information through oral, written, digital and visual presentation	• Produce scientific writings pertaining to social and behavioral issues in public health.	• Public Health Brief • R.O.A.D. Assignment • Collaborative Public Health Lit Review • Simulated Public Testimony
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Describe the role of poverty, discrimination, and stress in health and disease. • Illustrate how multilevel and systems-oriented interventions can influence individual and population health outcomes. • Illustrate different dimensions of social and health inequity and design solutions that may help to address inequity. • Summarize key features of a life course perspective on health. • Apply different levels of the socio-ecological model to issues such as obesity, mental health, and injury and violence.	• Class Discussion • R.O.A.D. Assignment • Collaborative Public Health Lit Review • Simulated Public Testimony
Design and evaluate interventions to prevent or control public health problems.	• Describe the key assumptions, methods, and limitations of evaluation research • Review and analyze the impact of public health interventions as documented in the peer review literature.	• Class discussions • Collaborative Public Health Lit Review
Engage and collaborate with diverse groups	• Develop a work plan that demonstrates active and effective collaboration among team members with diverse backgrounds	• Collaborative Public Health Lit Review • Simulated Public Testimony • Peer Group Evaluation

Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Delineate specific elements of socio-ecological, life course and/or social justice frameworks that can inform proposed solutions to public health problems	• Simulated Public Testimony • Collaborative Group Lit Review

Course Assessments

Explanation of Assignments Your understanding of the course material will be evaluated through the following:

1. Library Assignment (due to Prof John Pell on or before October 19)

The purpose of this assignment is to assist students in mastering information literacy research and citation skills, which will help them to identify appropriate resources for writing professional papers. The library assignment is mandatory for all students enrolled in the MPH program and currently taking PH 755. This assignment involves a two-step process:

All MPH students taking PH755 are advised to attend a 2.25-2.5 hour library workshop. The library session will provide students an opportunity to learn and practice the skills needed to complete the library assignment. Workshops will be offered during the dates and times listed below:

Room	Date	Time
SB C08	TUE 09/01/2015	05:45 PM - 08:00 PM
SB C08	WED 09/02/2015	03:45 PM - 06:00 PM
SB C08	THR 09/03/2015	03:45 PM - 06:00 PM
SB C08	TUE 09/08/2015	05:45 PM - 08:00 PM
SB C08	WED 09/09/2015	03:45 PM - 06:00 PM
SB C09	THR 09/10/2015	03:45 PM - 05:55 PM
SB C08	SAT 09/12/2015	09:30 AM - 12:00 PM
SB C08	SAT 09/19/2015	09:30 AM - 12:00 PM

You can sign up by sending an e-mail to Prof John Pell at jpell@hunter.cuny.edu. The Library Assignment, grading rubric and On Line tutorials are available at this link: http://libguides.library.hunter.cuny.edu/ph755. You are encouraged to sign-up early for a workshop and review this assignment prior to the start of the semester.

After attending the library sessions, students will complete a written library assignment. The satisfactory completion of this report will count for 10 percent of each student's grade for the PH 755 class. Professors John Pell and Stephanie Johnson will be the instructors in charge of the library sessions and will grade all assignments. Assignments should be submitted to John Pell via email at jpell@hunter.cuny.edu on or before **October 19**. Failure to submit the assignment on time will result in a grade of zero.

2. **Literature Review Paper: Analysis of an issue of public health significance (individual and group project)**

This assignment will consist of three steps:

a) *Public Health Brief: Individual assignment*, due **Sep 29**.

In this two-page assignment, students will state the significance of a topic of special interest to them that will also be related to a broader topic selected by their groups, particularly regarding its relevance from an urban health perspective. Please note that this is an individual assignment. Therefore, each student in each group has to submit two pages on their chosen topic of special interest. In this way, students will be working on one single topic during the semester, rather than on different ones. This individual assignment will help students practice their writing skills and clarify their own ideas about the subject of interest. In selecting your topic, ask yourself: Why am I interested in this topic? What would I like to find out about it? Why is this topic relevant from an urban public health perspective? Examples of Public Health Briefs will be provided in BlackBoard.

Students must include a minimum of three (3) references in the Public Health Brief and demonstrate a general understanding of the literature on the issue selected and justify its importance from an urban health perspective. All papers should be typed, double-spaced, spell-checked and proofread. Please use one inch margins all around and 12-point font. This assignment must be submitted via the SAFE ASSIGN feature in BlackBoard.

b) *Collaborative Public Health Literature Review, first version: Group assignment*, due on **Oct 20.**

In this group assignment, students will summarize and discuss key aspects related to a common research question derived from their selected public health issues as addressed in the literature. A review article consists of selecting a public health problem, reviewing what is currently known and what is still being asked about the problem in the scientific literature, including conflicting findings and gaps that may exist, and building an argument that will lead to a set of suggestions and recommendations. Students will write a critical summary of the key ideas, concepts and theories and properly cite each source.

A minimum of 10 references should be cited in this report, including both books and peer-reviewed articles. The structure of this review article should include at least the following components: (1) abstract; (2) introduction; (3) argument/subtopics; (4) discussion/concluding remarks; and (5) literature cited. Sample review articles are provided in BlackBoard – please refer to them prior to submitting your papers. Papers should be between 6 and 8 pages in length, not including abstract, references, tables or figures. Hard copies are not required for this assignment.

c) *Literature Review, final version: Group assignment*, due on **Dec 15.**

The final literature review will be an improved version of the first, which will take into account the instructor's suggestions as well as incorporate ongoing (i.e., updated) analysis of the existing literature on the subject selected. Students must also

incorporate the public health concepts discussed in the second half of the semester into the paper. Papers should be between **8 and 10 pages** in length, **not** including abstract, references, tables, or figures. **Electronic and hard copies are required for this assignment.**

3. Field Assignment

During Session #6 students will be required to complete a brief field-based assignment called the R.O.A.D. Assignment (Reflect, Observe, Analyze and Document). Details for this field assignment are available in BlackBoard (see Session #6) and documentation of the R.O.A.D assignment must be completed by **October 27**.

4. Oral Assignment

Simulated public testimonies (group project to be presented on **Dec 8 and Dec 15**)

Oral presentations will take the form of a **Simulated Public Testimony**. The goal of public testimony is to present evidence about a topic and deliver an argument for action, most often to influence policy decisions in question. Your group will present evidence on your group paper topic and provide arguments for public health action to address the problem.

Students will present as a group on the same day, but each group member will present and be graded separately. Each group member will present a 5-minute oral presentation; once all group members have presented the group will be allowed a 5-minute Q&A session. As in real public testimonies, presentations on individual sub-topics should be coordinated; although they are not always coordinated, they are much stronger when they are. Each group member should present a unique testimony and not repeat information that another group member discusses.

Students will be graded by both the instructor and their peers (students who are not presenting on that particular day will serve as panel members and be responsible for grading student performances and asking informed, constructive questions of the presenters).

Below are the main components of the presentation that each group should plan to address. It is not recommended that they do so, but students may use PowerPoint slides for their presentations. NOTE: If planning to use PowerPoint, students should load all group members' presentations into the same file so we can save time during the presentation.

Following is a suggestion for coordinating public testimonies:

(1) First group member starts with an issue introduction: This should be a brief summary of the issue addressed for your review paper which highlights the public health

relevance of the issue. Do not get bogged down with too many background details; assume we have basic knowledge of the gravity of most public health problems and how most diseases are transmitted (e.g., if your issue is HIV/AIDS, do not discuss basic ways HIV is transmitted unless it is especially important to your subtopics addressed).

(2) Next, group members discuss at least one main subtopic each, including review findings and implications: Describe the main subtopics/issues addressed in your paper. Include relevant evidence from your review and offer specific suggestions for implications, e.g., what are specific action steps you would recommend; provide any insight into interventions, policies or programs which could be implemented.

(3) The final group member finishes with a brief conclusion: Provide a brief, clear, concise concluding statement that summarizes the group's major argument for action.

Grading

Evaluation criteria

All assignments will be assessed based upon a rubric found on the course website. Specific information about grading criteria will be distributed with the assignment and made available in BlackBoard.

The relative weight of each course component is as follows:

Assessment	**Group/Individual**	**Due date(s)**	**Percent of Final Grade**
Class attendance and participation in class, including blog	Individual	All Sessions	20%
Public Health Brief	Individual	Sep 30	15%
Library Assignment	Individual	Oct 19	10%
Collaborative Public Health Review article, 1st version	Group	Oct 21	15%
ROAD Assignment	Individual	Oct 27	10%
Simulated Public Testimonies	Individual	Dec 9/16	10%
Collaborative Public Health Review article, Final version	Group	Dec 16	20%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9

B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
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F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

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Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

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When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Students are expected to attend class regularly and to be active, informed participants in all class discussions. This course maintains a blog via BlackBoard: all students are expected to write a minimum of one (1) blog entry over the course of the semester and to comment on the postings of others which will count toward their participation grade. The instructor may assign students as discussion leaders and will call on students in class to join discussions and exercises.

Late/incomplete submission of assignments

Late or incomplete assignments will not be accepted.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit allowed.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Learn how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours Monday through Friday and within 48 hours on Saturday or Sunday.
- Grading and feedback on assignments within 1 week of the due date.
- Communication about grades and progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

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Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings and Assessments
1.	**9/1 (C)**	Introductions & Overview of Course: An urban public health framework	***Cities and the Health of the Public*** *[hereafter,* ***CHP]:*** Galea et al. – Chapter 1 Optional: ***Prescription for a Healthy Nation*** *[hereafter,* ***PHN****]:* Chapter 1
2.	**9/8 (C)**	Theoretical Foundations: The social determinants of disease	Galea et al (2011); Geronimus (2000); Link & Phelan (1995) Optional: ***PHN*** - Chapter 14
No Class Sep 15 and classes follow a Friday schedule on Sep 22			
3.	**9/25 (O) Friday**	Theory & Practice of Urban Public Health Research	***CHP:*** Galea & Schulz – Chapter 14; Schwartz & Carpenter (1999)
4.	**9/29 (C)**	Historical Perspectives on Urban Public Health	Alcabes (2009); ***CHP:*** Rosner- Chapter 7 Optional: ***PHN*** – Chapter 2 ***PUBLIC HEALTH BRIEF DUE***
5.	**10/6 (O)**	The Urban Physical Environment	***CHP:*** Klitzman- Chapter 4; Optional: ***PHN*** – Chapter 6 [Optional: Guest Lecture Sec 2 on 10/7]
6.	**10/13 (O)**	The Urban Social Environment	***CHP:*** Coutts & Kawachi - Chapter 3; Klinenberg (2001); Optional: ***PHN*** – Chapter 7
Library Assignment due October 19			
7.	**10/20 (C)**	Social Inequalities & Health	Dressler et al (2005); Erwin (2008); LaViest (2011); Williams & Collins (2001);

			Optional: ***PHN*** – Chapter 5 ***FIRST VERSION, LITERATURE REVIEW PAPER DUE***

8.	**10/27 (C)**	Impact of Urbanization Migration Suburbanization on Health	***CHP*** : Freudenberg et al - Chapter 2; ***CHP***: Frumkin - Chapter 8; ***CHP****:* Fullilove- Chapter 9; Fullilove 2001 Film Screening: *El Barrio Tours* with Andrew Padilla ***R.O.A.D. Assignment Due***
9.	**11/3 (O)**	Theoretical Foundations of Behavioral Health Intervention	Glanz & Bishop (2010) Optional: ***PHN*** – Chapters 3 & 4; Cohen at al (2000)
Special Note: Last Day to Drop Course with "W" is Nov 9			
10.	**11/10 (C)**	Global Perspectives	***CHP***: McGranahan & Satterthwaite - Chapter 10; Sontag (2012)
11.	**11/17 (O)**	Current Issues in Public Health	TBA
12.	**11/24 (C)**	Public Health Nutrition	***CHP:*** Yeh & Katz – Chapter 6; Dorfman & Wallack (2007); Nestle & Jacobson (2000) Optional**:** ***PHN*** – Chapters 5 & 10
13.	**12/1 (O)**	Public Health Interventions & Community Health Programs	***CHP*****:** Freudenberg – Chapter 15; Frieden et al (2005); Richie et al (2001); Shea et al (1996); Stokols (1996)
14.	**12/8 (C)**	Simulated Public Testimonies	IOM (2002)
15.	**12/15 (C)**	Simulated Public Testimonies Last Class/Dish2Pass	***CHP****:* Vlahov et al – Chapter 16 ***FINAL LITERATURE REVIEW PAPER DUE***

Please note: This schedule and assignments are subject to change. Additional readings and handouts may be provided. Check BlackBoard and e-mail regularly for any updates.

<u>Session 1</u>. Sep 1. (C) Introductions and Overview: An urban public health framework

Advance Assignment (Complete *prior* to first class): Create a student profile in BlackBoard. Guidance for doing so will be posted in BlackBoard.

Required reading:

Galea S, Freudenberg N, Vlahov D. A framework for the study of urban health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 3-18 (Chapter 1).

Optional reading**:**

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press; 2005: 3-20 (Chapter 1: The Wrong Remedy).

Session 2. Sep 8. (C) The social determinants of health and health disparities

Required readings:

Galea S, Tracy M, Hoggatt KJ, DiMaggio C, Karpati A. Estimated deaths attributable to social factors in the United States. *Am J Public Health*. 2011; 101: 1456-1465.

Geronimus AT. To mitigate, resist, or undo: Addressing structural influences on the health of urban populations. *American Journal of Public Health.* 2000; 90(6): 867-872.

Link BG, Phelan J. Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior.* 1995; (Extra Issue): 80-94.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 206-220 (Chapter 14: Unequal Afflictions).

Session 3. Sep 25. (O) Research on urban health: Theoretical & methodological foundations [Note: This is a Friday]

Required readings:

Galea S, Schulz A. Methodological considerations in the study of urban health: How do cities affect health? In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 277-293 (Chapter 14).

Schwartz S, Carpenter KM. The right answer for the wrong question: Consequences of type III error for public health research. *American Journal of Public Health*. 1999; 89(8): 1175-1180.

Session 4: Sep 29. (C) Historical perspectives on urban public health

Assignment due: Public Health Brief

Required readings:

Alcabes P. Introduction. The origins of dread. In: Dread: *How Fear and Fantasy Have Fueled Epidemics from the Black Death to Avian Flu.* Cambridge MA*:* Public Affairs, 2009: 1-4.

Rosner, D. Public health in U.S. cities: A historical perspective. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 129-142.

Optional reading**:**

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 21-36 (Chapter 2: Greek Gods and American Myths).

Session 5: Oct 6. (O) The urban physical environment

Required readings:

Klitzman S, Matte TD, Kass DE. The urban physical environment and its effects on health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:61-84.

Optional readings:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 84-94 (Chapter 6: Sidewalks and Falling Children: Physical Structures).

Session 6. Oct 13. (O) The urban social environment

Required readings:

Coutts A, Kawachi I. The urban social environment and its effects on health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 49-60.

Klinenberg E. Dying alone: The social production of urban isolation. *Ethnography.* 2001; 2(4): 501-531.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 95-104 (Chapter 7: Playing by the Rules: Social Structures).

Library Assignment due October 19

Session 7. Oct 20. (C) Social inequalities and health

Assignment due*: *Collaborative public health literature review article, first draft

Required readings:

Dressler WW, Oths KS, Gravlee CC. Race and ethnicity in public health: Models to explain health disparities. *Annual Review of Anthropology*. 2005 (34): 231-252.

Erwin PC. Poverty in America: How public health practice can make a difference. *Am Jnl Public Health.* 2008; 98(9): 1570-1572.

LaVeist T, Pollack K, Thorpe R, Fesahazion, Gaskin D. Place, not race: Disparities dissipate in Southwest Baltimore when blacks and whites live under similar conditions. *Health Affairs* 2011; 30 (10): 1880-1887.

Williams DR and Collins C. Racial residential segregation: A fundamental cause of racial disparities in health. *Public Health Reports.* 2001; 116: 404-416.

Session 8. Oct 27. (C) The impact of urbanization, migration and suburbanization on health

Required readings:

Freudenberg N, Galea S, Vlahov D. Changing living conditions; changing health: U.S. cities since World War II. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 19-45.

Frumkin H. Cities, suburbs, and urban sprawl: Their impact on health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 143-175.

Fullilove MT. Root shock: The consequences of African American dispossession. *Jnl of Urban Health*. 2001; 78 (1): 72-80.

Fullilove MT. Fifty ways to destroy a city: Undermining the social foundation of health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 176-193.

Session 9: Nov 3. (0) Theoretical Foundations of Behavioral Health Interventions

Required readings:

Glanz K, Bishop DB. The role of behavioral science theory in development and implementation of public health interventions. *Ann Rev Public Health* 2010; 31: 399-418.

Optional readings:

Cohen DA, Scribner RA, Farley TA. A structural model of health behavior: A pragmatic approach to explain and influence health behaviors at the population level. *Prev Med* 2000; 30: 146-154.

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 37-52 & 53-68 (Chapter 3: Humans Behaving Badly and Chapter 4: Bell Curves & Bad Apples).

Session 10. Nov 10. (O) Global perspectives on urban health

Required readings:

McGranahan G, Satterthwaite D. A developing world perspective: Health and deficiencies in provision for water and sanitation in urban areas of Africa, Asia, and Latin America and the Caribbean. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:194-208.

Sontag D. In Haiti, global failures on a cholera epidemic. *New York Times*, March 31, 2012. [http://www.nytimes.com/2012/04/01/world/americas/haitis-cholera-outraced-the-experts-and-tainted-the-un.html?nl=todaysheadlines&emc=edit_th_20120401&_r=0].

Session 11. Nov 17. (O) Current issue in urban public health: TBA

Required readings: TBA

Session 12. Nov 24. (C) Urban public health nutrition

Required readings:

Dorfman L, Wallack L. Moving nutrition upstream: The case for reframing obesity. *Journal of Nutrition Education and Behavior.* 2007; 39: S45-S50.

Nestle M, Jacobson MF. Halting the obesity epidemic: A public health policy approach. *Public Health Reports*. 2000; 115(1): 12-24.

Yeh MC, Katz DL. Food, nutrition and the health of urban populations. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:106-125.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 71- 83 and 144-159 (Chapter 5: More is More/Accessibility and Chapter 10: Habits of the Heart).

Session 13. Dec 1. (O) Urban public health interventions and community health programs

Required readings:

Freudenberg, N. Interventions to improve urban health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:294-326.

Frieden TR, Mostashari F, Kerker BD, Miller N, Hajat A, Frankel M. Adult tobacco use levels after intensive control measures: New York City, 2002-2003. *Am Jnl Pub Health*. 2005; 95, 6: 1016-1023.

Richie B, Freudenberg N, Page J. Reintegrating women leaving jail into urban communities: A description of a model program. *Journal of Urban Health*. 2001; 78: 290-303.

Shea S, Basch CE, Wechsler H, Lantigua R. The Washington Heights-Inwood Healthy Heart Program: A 6-year report from the field. *Am Jnl Pub Health*. 1996; 86(2): 166-171.

Stokols D. Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion*. 1996; 10(4): 282-298.

Session 14. Dec 8. (C) Simulated Public Testimonies

Required readings:

Institute of Medicine. Who will keep the public healthy? Educating public health professionals for the 21st century. *Brief Report*. The National Academy of Sciences, 2000.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 105-127 (Chapter 8: It's the Real Thing/Media).

Session 15. Dec 15. (C) Simulated Public Testimonies & Dish-to-Pass

Assignment due*: *Collaborative public health literature review article, final version

Required reading:

Vlahov D, Galea S, Freudenberg N. Creating healthier cities: Where do we go from here? In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 327-344.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 75500.02: Fundamentals of Social and Behavioral Health (TRADL)
3 Credits
Fall 2015

Time and location	Wednesdays 6:05 – 7:50 PM, Silberman 214
Instructor	Dr. Lynn Roberts, PhD Office: Silberman Room 530 e-mail: lroberts@hunter.cuny.edu (preferred contact) phone: (212) 396-7742
Office hours	Wednesdays 4-6 PM and by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course provides a topical and theoretical survey of social and behavioral issues in public health.
Course prerequisites	N/A
Course format	This course is taught in a TRADITIONAL format with a mix of online learning resources, in class discussion, lecture, individual and collaborative exercises and assignments. All materials are available on the course website. This is not a self-paced course; there are weekly deadlines for discussion and activities.
Required reading and resources	Freudenberg N, Galea S and Vlahov D (eds.) *Cities and the Health of the Public*, Nashville, TN: Vanderbilt University Press, 2006, ISBN: 08265-1512-6.
Suggested reading and resources	Farley T, Cohen DA *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005. ISBN: 0-8070-2117-2

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Summarize the history and evolution of the field of social and behavioral health. • State the difference across primary, secondary and tertiary prevention.	• Class discussion
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Compare and contrast different models and theories, including the health belief model, social cognitive theory, community organizational theories, the socio-ecological model, and systems science, with regard to social and behavioral change. • Describe how health and disease are socially constructed. • Summarize basic principles and methods of effective health communication and social marketing to create social and behavioral change. • Summarize the theory of diffusion of innovation. • Justify the relevance of at least one theory from fields others than public health that may inform solutions for a public health problem.	• Class discussion • Course Blog • Public Health Brief • Collaborative Public Health Lit Review
Adhere to ethical and social justice principles and standards	• Relate contemporary public health problems to power and resource distribution, equity, diversity, sustainability, and intended and unintended consequences of interventions.	• Class discussion • Course Blog • CITI completion*
Interpret and analyze public health literature and apply evidence-based	• Conduct a comprehensive literature search and compile the results thereof on a given social and behavioral health issue. • Critique the merits and limitations of a scientific	• Public Health Brief • Collaborative Public Health Lit Review

research	article with relevance to social and behavioral health.	
Communicate public health information through oral, written, digital and visual presentation	• Produce scientific writings pertaining to social and behavioral issues in public health.	• Public Health Brief • R.O.A.D. Assignment • Collaborative Public Health Lit Review • Simulated Public Testimony
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Describe the role of poverty, discrimination, and stress in health and disease. • Illustrate how multilevel and systems-oriented interventions can influence individual and population health outcomes. • Illustrate different dimensions of social and health inequity and design solutions that may help to address inequity. • Summarize key features of a life course perspective on health. • Apply different levels of the socio-ecological model to issues such as obesity, mental health, and injury and violence.	• Class Discussion • R.O.A.D. Assignment • Collaborative Public Health Lit Review • Simulated Public Testimony
Design and evaluate interventions to prevent or control public health problems.	• Describe the key assumptions, methods, and limitations of evaluation research. • Review and analyze the impact of public health interventions as documented in peer review literature.	• Class discussions • Collaborative Public Health Lit Review
Engage and collaborate with diverse groups	• Develop a work plan that demonstrates active and effective collaboration among team members with diverse backgrounds.	• Collaborative Public Health Lit Review • Simulated Public Testimony • Peer Group Evaluation

Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Delineate specific elements of socio-ecological, life course and/or social justice frameworks that inform proposed solutions to public health problems.	• Simulated Public Testimony • Collaborative Group Lit Review

Course Assessments

Explanation of Assignments Your understanding of the course material will be evaluated through the following:

1. Library Assignment (due to Prof John Pell on or before October 19)

The purpose of this assignment is to assist students in mastering information literacy research and citation skills, which will help them to identify appropriate resources for writing professional papers. The library assignment is mandatory for all students enrolled in the MPH program and currently taking PH 755. This assignment involves a two-step process:

All MPH students taking PH755 are advised to attend a 2.25-2.5 hour library workshop. The library session will provide students an opportunity to learn and practice the skills needed to complete the library assignment. Workshops will be offered during the dates and times listed below:

Room	Date	Time
SB C08	TUE 09/01/2015	05:45 PM - 08:00 PM
SB C08	WED 09/02/2015	03:45 PM - 06:00 PM
SB C08	THR 09/03/2015	03:45 PM - 06:00 PM
SB C08	TUE 09/08/2015	05:45 PM - 08:00 PM
SB C08	WED 09/09/2015	03:45 PM - 06:00 PM
SB C09	THR 09/10/2015	03:45 PM - 05:55 PM
SB C08	SAT 09/12/2015	09:30 AM - 12:00 PM
SB C08	SAT 09/19/2015	09:30 AM - 12:00 PM

You can sign up by sending an e-mail to Prof John Pell at jpell@hunter.cuny.edu. The Library Assignment, grading rubric and On Line tutorials are available at this link: http://libguides.library.hunter.cuny.edu/ph755. You are encouraged to sign-up early for a workshop and review this assignment prior to the start of the semester.

After attending the library sessions, students will complete a written library assignment. The satisfactory completion of this report will count for 10 percent of each student's grade for the PH 755 class. Professors John Pell and Stephanie Johnson will be the instructors in charge of the library sessions and will grade all assignments. Assignments should be submitted to John Pell via email at jpell@hunter.cuny.edu on or before **October 19**. Failure to submit the assignment on time will result in a grade of zero.

2. **Literature Review Paper: Analysis of an issue of public health significance (individual and group project)**

This assignment will consist of three steps:

a) *Public Health Brief: Individual assignment*, due **Sep 30**.

In this two-page assignment, students will state the significance of a topic of special interest to them that will also be related to a broader topic selected by their groups, particularly regarding its relevance from an urban health perspective. Please note that this is an individual assignment. Therefore, each student in each group has to submit two pages on their chosen topic of special interest. In this way, students will be working on one single topic during the semester, rather than on different ones. This individual assignment will help students practice their writing skills and clarify their own ideas about the subject of interest. In selecting your topic, ask yourself: Why am I interested in this topic? What would I like to find out about it? Why is this topic relevant from an urban public health perspective? Examples of Public Health Briefs will be provided in BlackBoard.

Students must include a minimum of three (3) references in the Public Health Brief and demonstrate a general understanding of the literature on the issue selected and justify its importance from an urban health perspective. All papers should be typed, double-spaced, spell-checked and proofread. Please use one inch margins all around and 12-point font. This assignment must be submitted via the SAFE ASSIGN feature in BlackBoard.

b) *Collaborative Public Health Literature Review, first version: Group assignment*, due on **Oct 21.**

In this group assignment, students will summarize and discuss key aspects related to a common research question derived from their selected public health issues as addressed in the literature. A review article consists of selecting a public health problem, reviewing what is currently known and what is still being asked about the problem in the scientific literature, including conflicting findings and gaps that may exist, and building an argument that will lead to a set of suggestions and recommendations. Students will write a critical summary of the key ideas, concepts and theories and properly cite each source.

A minimum of 10 references should be cited in this report, including both books and peer-reviewed articles. The structure of this review article should include at least the following components: (1) abstract; (2) introduction; (3) argument/subtopics; (4) discussion/concluding remarks; and (5) literature cited. Sample review articles are provided in BlackBoard – please refer to them prior to submitting your papers. Papers should be between 6 and 8 pages in length, not including abstract, references, tables or figures. Hard copies are not required for this assignment.

c) *Literature Review, final version: Group assignment*, due on **Dec 16.**

The final literature review will be an improved version of the first, which will take into account the instructor's suggestions as well as incorporate ongoing (i.e., updated) analysis of the existing literature on the subject selected. Students must also

incorporate the public health concepts discussed in the second half of the semester into the paper. Papers should be between **8 and 10 pages** in length, **not** including abstract, references, tables, or figures. **Electronic and hard copies are required for this assignment.**

3. Field Assignment

In lieu of meeting in class for Session 6 (October 14), students will be required to complete a brief field-based assignment called the R.O.A.D. Assignment (Reflect, Observe, Analyze and Document). Details for this assignment are available in BlackBoard (see Session 6) and documentation of the R.O.A.D Assignment must be completed by **October 28**.

4. Oral Assignment

Simulated public testimonies (group project to be presented on **Dec 9 and Dec 16**)

Oral presentations will take the form of a **Simulated Public Testimony**. The goal of public testimony is to present evidence about a topic and deliver an argument for action, most often to influence policy decisions in question. Your group will present evidence on your group paper topic and provide arguments for public health action to address the problem.

Students will present as a group on the same day, but each group member will present and be graded separately. Each group member will present a 5-minute oral presentation; once all group members have presented the group will be allowed a 5-minute Q&A session. As in real public testimonies, presentations on individual sub-topics should be coordinated; although they are not always coordinated, they are much stronger when they are. Each group member should present a unique testimony and not repeat information that another group member discusses.

Students will be graded by both the instructor and their peers (students who are not presenting on that particular day will serve as panel members and be responsible for grading student performances and asking informed, constructive questions of the presenters).

Below are the main components of the presentation that each group should plan to address. It is not recommended that they do so, but students may use PowerPoint slides for their presentations. NOTE: If planning to use PowerPoint, students should load all group members' presentations into the same file so we can save time during the presentation.

Following is a suggestion for coordinating public testimonies:

(1) First group member starts with an issue introduction: This should be a brief summary of the issue addressed for your review paper which highlights the public health relevance of the issue. Do not get bogged down with too many background details; assume we have basic knowledge of the gravity of most public health problems and how most diseases are transmitted (e.g., if your issue is HIV/AIDS, do not discuss basic ways HIV is transmitted unless it is especially important to your subtopics addressed).

(2) Next, group members discuss at least one main subtopic each, including review findings and implications: Describe the main subtopics/issues addressed in your paper. Include relevant evidence from your review and offer specific suggestions for implications, e.g., what are specific action steps you would recommend; provide any insight into interventions, policies or programs which could be implemented.

(3) The final group member finishes with a brief conclusion: Provide a brief, clear, concise concluding statement that summarizes the group's major argument for action.

Grading

Evaluation criteria

All assignments will be assessed based upon a rubric found on the course website. Specific information about grading criteria will be distributed with the assignment and made available in BlackBoard.

The relative weight of each course component is as follows:

Assessment	**Group/Individual**	**Due date(s)**	**Percent of Final Grade**
Class attendance and participation in class, including blog	Individual	All Sessions	20%
Public Health Brief	Individual	Sep 30	15%
Library Assignment	Individual	Oct 19	10%
Collaborative Public Health Review article, 1st version	Group	Oct 21	15%
ROAD Assignment	Individual	Oct 28	10%
Simulated Public Testimonies	Individual	Dec 9/16	10%
Collaborative Public Health Review article, Final version	Group	Dec 16	20%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4

A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Students are expected to attend class regularly and to be active, informed participants in all class discussions. This course maintains a blog via BlackBoard: all students are expected to write a minimum of one (1) blog entry over the course of the semester and to comment on the postings of others which will count toward their participation grade. The instructor may assign students as discussion leaders and will call on students in class to join discussions and exercises.

Late/incomplete submission of assignments

Late or incomplete assignments will not be accepted.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit allowed.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Learn how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours Monday through Friday and within 48 hours on Saturday or Sunday.
- Grading and feedback on assignments within 1 week of the due date.
- Communication about grades and progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room

1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings and Assessments
1.	**Sep 2**	Introductions & Overview of Course: An urban public health framework	***Cities and the Health of the Public*** *[hereafter,* ***CHP]:*** Galea et al. – Chapter 1 Optional: ***Prescription for a Healthy Nation*** *[hereafter,* ***PHN****]:* Chapter 1
2.	**Sep 9**	Theoretical Foundations: The social determinants of disease	Galea et al (2011); Geronimus (2000); Link & Phelan (1995); Optional: ***PHN*** - Chapter 14
3.	**Sep 16**	Theory & Practice of Urban Public Health Research	***CHP:*** Galea & Schulz – Chapter 14; Schwartz & Carpenter (1999)
No Class Sep 23 – Classes follow a Friday schedule			
4.	**Sep 30**	Historical Perspectives on Urban Public Health	Alcabes (2009); ***CHP:*** Rosner- Chapter 7 Optional: ***PHN*** – Chapter 2 ***PUBLIC HEALTH BRIEF DUE***
5.	**Oct 7**	The Urban Physical Environment	***CHP:*** Klitzman- Chapter 4 Optional: ***PHN*** – Chapter 6 [Guest Lecture: TBA]
6.	**Oct 14**	The Urban Social Environment – Field Day (No Class Session)	***CHP:*** Coutts & Kawachi - Chapter 3; Klinenberg (2001) Optional: ***PHN*** – Chapter 7

		Library Assignment due October 19	
7.	**Oct 21**	Social Inequalities & Health	Dressler et al (2005); Erwin (2008); LaViest (2011); Williams & Collins (2001) Optional: ***PHN*** – Chapter 5 ***FIRST VERSION, LITERATURE REVIEW PAPER DUE***

8.	**Oct 28**	Impact of Urbanization Migration Suburbanization on Health	***CHP*** : Freudenberg et al - Chapter 2; ***CHP***: Frumkin - Chapter 8; ***CHP****:* Fullilove- Chapter 9; Fullilove 2001 Film Screening: *El Barrio Tours* with Andrew Padilla ***R.O.A.D. Assignment Due***
9.	**Nov 4**	Theoretical Foundations of Behavioral Health Interventions	Glanz & Bishop (2010) Optional: ***PHN*** – Chapters 3 & 4; Cohen at al (2000)
		Special Note: Last Day to Drop Course with "W" is Nov 9	
10.	**Nov 11**	Global Perspectives	***CHP***: McGranahan & Satterthwaite - Chapter 10; Sontag (2012) [Guest Lecture: TBA]
11.	**Nov 18**	Current Issues in Urban Public Health	TBA
12.	**Nov 25**	Public Health Nutrition	***CHP:*** Yeh & Katz – Ch 6; Dorfman & Wallack (2007); Nestle & Jacobson (2000) Optional: ***PHN*** – Chapters 5 & 10
13.	**Dec 2**	Public Health Interventions & Community Health Programs	***CHP*****:** Freudenberg – Chapter 15; Frieden et al (2005); Richie et al (2001); Shea et al (1996); Stokols (1996)
14.	**Dec 9**	Simulated Public Testimonies	IOM (2002)
15.	**Dec 16**	Simulated Public Testimonies Last Class/Dish2Pass	***CHP****:* Vlahov et al – Chapter 16 ***FINAL LITERATURE REVIEW PAPER DUE***

Please note: This schedule and assignments are subject to change. Additional readings and handouts may be provided. Check BlackBoard and e-mail regularly for any updates.

Session 1. Sep 2. Introductions and Overview: An urban public health framework

Advance Assignment (Complete *prior* to first class): Create a student profile in BlackBoard. Guidance for doing so will be posted in BlackBoard.

Required reading:

Galea S, Freudenberg N, Vlahov D. A framework for the study of urban health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 3-18 (Chapter 1).

Optional reading**:**

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press; 2005: 3-20 (Chapter 1: The Wrong Remedy).

Session 2. Sep 9. The social determinants of health and health disparities

Required readings:

Galea S, Tracy M, Hoggatt KJ, DiMaggio C, Karpati A. Estimated deaths attributable to social factors in the United States. *Am J Public Health*. 2011; 101: 1456-1465.

Geronimus AT. To mitigate, resist, or undo: Addressing structural influences on the health of urban populations. *American Journal of Public Health.* 2000; 90(6): 867-872.

Link BG, Phelan J. Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior.* 1995; (Extra Issue): 80-94.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 206-220 (Chapter 14: Unequal Afflictions).

Session 3. Sep 16. Research on urban health: Theoretical & methodological foundations

Required readings:

Galea S, Schulz A. Methodological considerations in the study of urban health: How do cities

affect health? In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 277-293 (Chapter 14).

Schwartz S, Carpenter KM. The right answer for the wrong question: Consequences of type III error for public health research. *American Journal of Public Health*. 1999; 89(8): 1175-1180.

Session 4: Sep 30. Historical perspectives on urban public health

Assignment due: Public Health Brief

Required readings:

Alcabes P. Introduction. The origins of dread. In: Dread: *How Fear and Fantasy Have Fueled Epidemics from the Black Death to Avian Flu.* Cambridge MA*:* Public Affairs, 2009: 1-4.

Rosner, D. Public health in U.S. cities: A historical perspective. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 129-142.

Optional reading**:**

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 21-36 (Chapter 2: Greek Gods and American Myths).

Session 5: Oct 7. The urban physical environment [Guest Lecture: TBA]

Required readings:

Klitzman S, Matte TD, Kass DE. The urban physical environment and its effects on health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:61-84.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 84-94 (Chapter 6: Sidewalks and Falling Children: Physical Structures).

Library Assignment due October 19

Session 6. Oct 14. The urban social environment [No Class – Field Day]

Required readings:

Coutts A, Kawachi I. The urban social environment and its effects on health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 49-60.

Klinenberg E. Dying alone: The social production of urban isolation. *Ethnography.* 2001; 2(4): 501-531.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 95-104 (Chapter 7: Playing by the Rules: Social Structures).

Session 7. Oct 21. Social inequalities and health

Assignment due*: *Collaborative public health literature review article, first draft

Required readings:

Dressler WW, Oths KS, Gravlee CC. Race and ethnicity in public health: Models to explain health disparities. *Annual Review of Anthropology*. 2005 (34): 231-252.

Erwin PC. Poverty in America: How public health practice can make a difference. *Am Jnl Public Health.* 2008; 98(9): 1570-1572.

LaVeist T, Pollack K, Thorpe R, Fesahazion, Gaskin D. Place, not race: Disparities dissipate in Southwest Baltimore when blacks and whites live under similar conditions. *Health Affairs* 2011; 30 (10): 1880-1887.

Williams DR and Collins C. Racial residential segregation: A fundamental cause of racial disparities in health. *Public Health Reports.* 2001; 116: 404-416.

Session 8. Oct 28. The impact of urbanization, migration and suburbanization on health

Assignment due R.O.A.D. Assignment
Required readings:

Freudenberg N, Galea S, Vlahov D. Changing living conditions; changing health: U.S. cities since World War II. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the*

Health of the Public. Nashville, TN: Vanderbilt University Press; 2006: 19-45.

Frumkin H. Cities, suburbs, and urban sprawl: Their impact on health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 143-175.

Fullilove MT. Root shock: The consequences of African American dispossession. *Jnl of Urban Health*. 2001; 78 (1): 72-80.

Fullilove MT. Fifty ways to destroy a city: Undermining the social foundation of health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 176-193.

Session 9: Nov 4. Theoretical Foundations of Behavioral Health Interventions

Required readings:

Glanz K, Bishop DB. The role of behavioral science theory in development and implementation of public health interventions. *Ann Rev Public Health* 2010; 31: 399-418.

Optional readings:

Cohen DA, Scribner RA, Farley TA. A structural model of health behavior: A pragmatic approach to explain and influence health behaviors at the population level. *Prev Med* 2000; 30: 146-154.

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 37-52 & 53-68 (Chapter 3: Humans Behaving Badly and Chapter 4: Bell Curves & Bad Apples).

Session 10. Nov 11. Global perspectives on urban health [Guest Lecure: TBA]

Required readings:

McGranahan G, Satterthwaite D. A developing world perspective: Health and deficiencies in provision for water and sanitation in urban areas of Africa, Asia, and Latin America and the Caribbean. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:194-208.

Sontag D. In Haiti, global failures on a cholera epidemic. *New York Times*, March 31, 2012. [http://www.nytimes.com/2012/04/01/world/americas/haitis-cholera-outraced-the-experts-and-tainted-the-un.html?nl=todaysheadlines&emc=edit_th_20120401&_r=0].

Session 11. Nov 18. Current issue in urban public health: Legionnaires Outbreak in Bronx

Required readings: TBA

Session 12. Nov 25. Urban public health nutrition

Required readings:

Dorfman L, Wallack L. Moving nutrition upstream: The case for reframing obesity. *Journal of Nutrition Education and Behavior.* 2007; 39: S45-S50.

Nestle M, Jacobson MF. Halting the obesity epidemic: A public health policy approach. *Public Health Reports*. 2000; 115(1): 12-24.

Yeh MC, Katz DL. Food, nutrition and the health of urban populations. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:106-125.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 71- 83 and 144-159 (Chapter 5: More is More/Accessibility and Chapter 10: Habits of the Heart).

Session 13. Dec 2. Urban public health interventions and community health programs

Required readings:

Freudenberg, N. Interventions to improve urban health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:294-326.

Frieden TR, Mostashari F, Kerker BD, Miller N, Hajat A, Frankel M. Adult tobacco use levels after intensive control measures: New York City, 2002-2003. *Am Jnl Pub Health*. 2005; 95, 6: 1016-1023.

Richie B, Freudenberg N, Page J. Reintegrating women leaving jail into urban communities: A description of a model program. *Journal of Urban Health*. 2001; 78: 290-303.

Shea S, Basch CE, Wechsler H, Lantigua R. The Washington Heights-Inwood Healthy Heart Program: A 6-year report from the field. *Am Jnl Pub Health*. 1996; 86(2): 166-171.

Stokols D. Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion*. 1996; 10(4): 282-298.

Session 14. Dec 9. Simulated Public Testimonies

Required readings:

Institute of Medicine. Who will keep the public healthy? Educating public health professionals for the 21st century. *Brief Report*. The National Academy of Sciences, 2000.

Optional reading:

Farley T, Cohen DA. *Prescription for a Healthy Nation: A New Approach to Improving Our Lives by Fixing Our Everyday World*. Boston: Beacon Press, 2005: 105-127 (Chapter 8: It's the Real Thing/Media).

Session 15. Dec 16. Simulated Public Testimonies & Dish-to-Pass

Assignment due*: *Collaborative public health literature review article, final version

Required reading:

Vlahov D, Galea S, Freudenberg N. Creating healthier cities: Where do we go from here? In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 327-344.

Last Updated September 21, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 75500 – Fundamentals of Social and Behavioral Health
3 Credits
Fall 2015

Time and location	Fully online (i.e., no in-person meetings). Students are free to meet in small groups on their own or schedule meetings with instructors as needed.
Instructor	Terry Huang, PhD, MPH, CPH Professor, CUNY School of Public Health 55 W 125th Street – 806 Phone 646-664-8358 terry.huang@sph.cuny.edu (preferred contact) Co-Instructor: Margaret Wolff, MPH, DPH Candidate margaret.wolff@gmail.com
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course provides a topical and theoretical survey of social and behavioral issues in public health.
Course prerequisites	N/A
Course format	This course is taught with a mix of online learning resources, discussion, collaborative exercises, self-assessment, and case studies. All materials are available on the course website. This is not a self-paced course; there are weekly deadlines for discussion and activities.
Required reading and resources	Coreil J, ed. Social and Behavioral Foundations of Public Health. 2nd Ed. Thousand Oaks, CA: Sage Publications, 2010. http://www.amazon.com/Social-Behavioral-Foundations-Public-Health/dp/1412957044 http://www.sagepub.com/textbooks/Book231717
Suggested reading and resources	None

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
1. Apply the public health core functions of assessment, policy development and assurance.	▪ Summarize the history and evolution of the field of social and behavioral health. ▪ State the difference across primary, secondary and tertiary prevention.	Quiz
2. Apply theories, concepts, models and methods to the design of public health research, policy, and practice.	▪ Compare and contrast different models and theories, including the health belief model, social cognitive theory, community organizational theories, the socio-ecological model, and systems science, with regard to social and behavioral change. ▪ Describe how health and disease are socially constructed. ▪ Summarize basic principles and methods of effective health communication and social marketing to create social and behavioral change. ▪ Summarize the theory of diffusion of innovation. ▪ Justify the relevance of at least one theory from fields others than public health that may inform solutions for a public health problem.	Discussion Boards, Review Paper, Presentation
3. Adhere to ethical and social justice principles and standards.	▪ Relate contemporary public health problems to power and resource distribution, equity, diversity, sustainability, and intended and unintended consequences of interventions.	Discussion Boards, Review Paper, Presentation
4. Interpret and analyze public health literature and apply evidence-based research.	▪ Conduct a comprehensive literature search and compile the results thereof on a given social and behavioral health issue. ▪ Critique the merits and limitations of a scientific article with relevance to social and behavioral health.	Review Paper, Presentation

5. Communicate public health information through oral, written, digital and visual presentation.	▪ Produce scientific writings pertaining to social and behavioral issues in public health. ▪ Translate research evidence into policy recommendations. ▪ Produce a short presentation to persuade the public and/or policymakers of the importance of addressing the social and behavioral dimensions of a public health problem.	Discussion Boards, Review Paper, Presentation
6. Explain how social, behavioral, biomedical and environmental determinants affect population health.	▪ Describe the role of poverty, discrimination, and stress in health and disease. ▪ Illustrate how multilevel and systems-oriented interventions can influence individual and population health outcomes. ▪ Illustrate different dimensions of social and health inequity and design solutions that may help to address inequity. ▪ Summarize key features of a life course perspective on health. ▪ Apply different levels of the socio-ecological model to issues such as obesity, mental health, and injury and violence.	Discussion Boards
7. Engage and collaborate with diverse groups.	▪ Develop a work plan that demonstrates active and effective collaboration among team members with diverse backgrounds. ▪ Summarize principles of community-based participatory research.	Review Paper, Presentation

Course Assessments
Details about the assignments and grading criteria can be found on the course website. Your understanding of the course material will be evaluated through seven online discussion boards and two group projects.

Online Self-Introduction (2 points)
In the spirit of collaboration and developing a classroom ambiance, during the first week of the course, you will post a short bio of yourself (250 words) along with a picture.

Quiz (4 points)
A short multiple-choice quiz will be made available on Blackboard to assess Competency #1 above.

Online Discussion Boards (24 points)
Seven online discussion boards will be posted/initiated by the instructor. Each discussion board will be open for two weeks and be worth 4 points. Each student is responsible for tracking the discussion boards regularly and providing meaningful comments that demonstrate applications/linkages to course concepts. When posting, please following the online etiquettes described below.

Grading for each student on each discussion board assignment will be (4 points per discussion board):

Participation – 1 point for one comment, 2 points for 2+ comments

Quality – (i.e., whether comments enrich the discussion and/or link to course concepts) – 2 points

Group Projects (70 points)
Students will be randomly assigned to small groups of five. Two (2) group assignments will be posted at the beginning of the semester, with different components of each group assignment becoming due throughout the semester (see schedule below for details). The first group project involves a review paper, sections of which will be due at different points in the course, allowing the instructor to provide feedback so that students can build on each successive piece of the paper. The second group project involves a multimedia presentation/exposé that illustrates one or more dimensions of social determinants of health. As part of each project, a collaborative work plan for each group will be submitted in advance (as a component of the grade) and each completed project must indicate the specific contribution of each student in the group. The work plan should detail the mode and frequency of communication; who is in charge of initiating communication, coordinate the group, and putting the final pieces of a project together; how tasks will be delegated to team members; and what strategies will be utilized to address conflict. This work plan needs to be electronically or digitally signed by each student to indicate the plan has the agreement of all group members. Each student's contribution to a group project will be assessed on a 5-point scale based on a standardized self and peer evaluation form. One person from each group must post the

project through the assignment link in Blackboard by the due date. Details for each group project are as follows:

Review Paper on Social Determinants of Health (45 points): The review paper will be 15 pages maximum (double-spaced, standard font 12, 1 inch margins on all sides). Tables, figures, and references do not count towards the page limit. Each group will submit the required components to the instructor via Blackboard. Grading for the paper will be divided into the following components:

Research Question and Bibliography (10 points)
Group Collaborative Work Plan (5 points)
Paper Outline (10 points)
Final Paper Including Policy Recommendations (15 points)
Contribution to Group Paper (Averaged between Self and Peer Report, 5 points)

Consider the following for your paper outline and final paper:
What is the problem?
What is the extent of this problem?
Whom does this problem affect?
What are the individual, social, environmental, and policy factors that contribute to this problem?
What has been done about this problem?
What seems to the most effective or most promising solution(s)? Do any of these solutions address the structures or feedbacks within the system that gives rise to the problem?
What are the research/policy implications?

Pecha Kucha Presentation (25 points): The presentation will use the format of Pecha Kucha (http://www.pechakucha.org), which entails 20 slides, 20 seconds each. This compels the presenter to be concise and learn to deliver a storyline in the most efficient and effective way possible. For such a presentation, you want to use your slides to project visuals as much as possible. It is difficult to go through a text-heavy slide in 20 seconds. Your presentation will be based on the same topic as your review paper. However, the angle you take to convey the ideas may be varied. For example, you may cut into the topic through a story or a case study. Or you may cut into the topic based on the results of a population survey that shed new light on the problem. Be creative as your develop the storyboard of your presentation. Be clear about what your top three take home messages are. To avoid recording challenges, prepare your slides in Powerpoint and write out your script (what you would say) in the Notes section under each slide. You WILL NOT be required to record your voice directly into the presentation.

Each group will post the Powerpoint presentation on Blackboard as a discussion thread, so that students from other groups can provide comments. Grading for the presentation will include:

- Group Collaborative Work Plan (5 points)

- Final Presentation (10 points)
- Contribution to Group Presentation (Averaged between Self and Peer Report, 5 points)
- Online Feedback on Other Groups' Presentations (5 points)

Grading

Evaluation criteria
All assignments will be assessed based upon a rubric found on the course website. Specific information about grading criteria will be distributed with the assignment.

The relative weight of each course component is as follows:

Assignment	Due	Format	Percentage
Self-Profile	9/6	Individual	**2**
Quiz	9/13	Individual	**4**
Discussion Boards 1-6	9/27 – 12/13	Individual	**24**
Review Paper (see below for parts)		Group	**45**
• *Research Question and Bibliography*	9/20		*(10)*
• *Work Plan*	10/4		*(5)*
• *Paper Outline*	10/18		*(10)*
• *Final Paper*	11/22		*(15)*
• *Self/Peer Evaluation*			*(5)*
Presentation	11/22	Group	**25**
• *Work Plan*	10/25		*(5)*
• *Final Presentation*	12/6		*(10)*
• *Self/Peer Evaluation*	12/6		*(5)*
• *Peer Feedback on Presentations*	12/13		*(5)*
TOTAL			**100**

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4

F	0	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
Expect to actively contribute to the discussion and complete and submit all assignments by posted due dates. Missed assignments or lack of discussion participation not only affect the individual student, but they also affect the class as a whole due to the high degree of interaction within the course. Grades for interactive communication are based on a rubric that includes the number, tone, and content of your contributions and the attitude you display towards others.

Late/incomplete submission of assignments
Late or incomplete assignments are not accepted.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 48 hours Monday through Friday.
- Grading and feedback on assignments within 1 week of the due date.
- Communication about grades and progress in the course will be given through the course website.

Class citizenship & rules of conduct: When communicating or completing your assignments online via Blackboard, pay attention to the following:

1. Check before you post. Always check whether a similar question that has been posted and answered on the discussion board to avoid duplicated messages and responses.
2. Use a descriptive subject line that reflects the content of your message. It makes the discussion/communication more efficient.
3. Write in short paragraphs or use bullets to break down your ideas into smaller chunks of information. This will make your postings easier to read. Avoid using more than 200 words per post.
4. Do not write in all uppercase. USING ALL CAPS MEANS YOU ARE SHOUTING although you may not mean it.
5. Avoid using sarcasm as it often is interpreted as rude and hurtful.
6. Do not edit or change message content when someone has already responded to you. If you have something to add or change, simply add a follow-up message.
7. People in this course may come from places around the world, so be respectful to diverse perspectives, cultures, and languages.
8. Be professional and engage with others respectfully.

Email correspondence: Email correspondence with instructors is preferred. Any problems you encounter during the course should be communicated to the instructors by email as soon as possible. We also welcome your email feedback on how we can improve your experience in the course. The instructors will generally respond to email within two business days.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule
This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings/Resources	Assessment
1	8/27-9/6	Overview and Introduction to the Course Tips for Writing Well	Chapters 1 and 2 Writing Tutorial: http://jjc.jjay.cuny.edu/erc/writing/	Self Introduction Due
2	9/7-9/13	Tips on Literature Search and Review	Videos 4, 5, and 10 required: http://library.medicine.yale.edu/tutorials/subjects/systematic-reviews Additional resources at Hunter: http://libguides.library.hunter.cuny.edu/ph755/assignment	Quiz Due
3	9/14-9/20	Race, Poverty and Discrimination	Chapter 3 Geronimus A. To mitigate, resist, or undo: addressing structural influences on the health of urban populations. Am J Public Health 2000; 90:867-872. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1446247/pdf/10846503.pdf Braveman P, Egerter S, Barclay C. Income, wealth and health. In: *Exploring Social Determinants of Health (series).* Princeton, NJ: Robert Wood Johnson Foundation, 2011. http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2011/rwjf70448. Blosnich JR, Horn K. Associations of discrimination and violence with smoking among emerging adults:	Research Question & Bibliography Due Discussion Board 1 (starts 9/14 – closes 9/27 at 11:59pm)

			differences by gender and sexual orientation. Nicotine Tob Res 2011; 13:1284-1295. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3223581/	
4	9/21-9/27	Behavior and Health	Chapters 4 (pp. 73-80) and 5 Health Belief Model (video): https://www.youtube.com/watch?v=6SfTbTkEozA Theory of Planned Behavior (video): https://www.youtube.com/watch?v=DFn-IOcpd8A Transtheoretical Model of Behavior Change (video): https://www.youtube.com/watch?v=oO80XyBDrl0 Design for Change (video): https://www.youtube.com/watch?v=NIEYLEV0_OA#t=112	
5	9/28-10/4	Social Support and Stress	Chapters 4 (pp. 80-81) and 6 Lazarus Theory of Coping (Video): https://www.youtube.com/watch?v=Ir7cqVKUjN8#t=39 Egerter S, Braveman P, Barclay C. Stress and health. In: *Exploring Social Determinants of Health (series).* Princeton, NJ: Robert Wood Johnson Foundation, 2011. http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2011/rwjf70441 Fowler JH, Christakis NA. Dynamic spread of happiness in a large social network: longitudinal	Review Paper Collaborative Work Plan Due Discussion Board 2 (Starts 9/28 – closes 10/11 at 11:59pm)

			analysis over 20 years in the Framingham Heart Study. BMJ 2008; 337:a2338. http://dash.harvard.edu/bitstream/handle/1/3685822/Christakis_DynamicSpreadHappiness.pdf?sequence=2	
6	10/5-10/11	Culture & Health / Social Reactions to Illness	Chapters 4 (p.83) 7 and 8 Video: Culture Matters: Indigenous Perspectives on Behavioral Healthcare https://www.youtube.com/watch?v=yfdCaFEls_c	
7	10/12-10/18	Health Disparities and Community-Based Approaches to Health Promotion	Chapters 9 and 14 CDC. Racial and Ethnic Minority Populations. Accessed Nov. 13, 2014: http://www.cdc.gov/minorityhealth/populations/remp.html American Sociological Association (ASA). Race, Ethnicity, and the Health of Americans. In: *ASA Series on How Race and Ethnicity Matter.* ASA, 2005. http://www2.asanet.org/centennial/race_ethnicity_health.pdf. Sekhobo JP, Edmunds LS, Delenius K, Jernigan J, Davis CF, Giddings M, Lesesne C, Khan LK. Neighborhood disparities in prevalence of childhood obesity among low-income children before and after implementation of New York City Child Care Regulations. Preve Chronic Dis 2014; 11:140152. http://dx.doi.org/10.5888/pcd11.14	Review Paper Outline Due Discussion Board 3 (Starts 10/12 – closes 10/25 at 11:59pm)

			0152	
8	10/19-10/25	Socioecological Models of Health	Huang TT, Drewnowski A, Kumanyika SK, Glass TA. A systems-oriented multilevel framework for address obesity in the 21st century. Prev Chronic Dis 2009; 6:A82. http://www.cdc.gov/pcd/issues/2009/jul/09_0013.htm Galea S, Freudenberg N, Vlahov D. A framework for the study of urban health. In: Freudenberg N, Galea S, Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006:3-18.	Presentation Work Plan Due
9	10/26-11/1	Built Environment and Health	Chapters 4 (pp. 83-88) and 17 Wilhelm Stanis SA, Oftedal A, Schneider I. Association of outdoor recreation availability with physical activity and weight status in Minnesota youth. Preventive Medicine, 2014; 60:124-127. http://www.sciencedirect.com/science/article/pii/S009174351300443X Sallis JF, Slymen DJ, Conway TL, Frank LD, Saelens BE, Cain K, Chapman JE. Income disparities in perceived neighborhood built and social environment attributes. Health and Place 2011; 17:1274-1283. http://www.sciencedirect.com/science/article/pii/S1353829211000463	Discussion Board 4 (starts 10/26 – closes 11/8 at 11:59pm)
10	11/2-11/8	Health Communication and Social Marketing	Chapters 4 (p.82) and 15 Corcoran N. Theories and models in communicating health messages. In: Corcoran N.	

			Communicating Health: Strategies for Health Promotion." London: SAGE Publications, 2007. http://www.corwin.com/upm-data/13975_Corcoran___Chapter_1.pdf Lefebvre RC, Bornkessel AS. Social media as a tool in medicine. Circulation 2013; 127:1829-1836. http://circ.ahajournals.org/content/127/17/1829.full Lefebvre RC. Social Models for Marketing: Diffusion. 2009. Accessed Nov. 18, 2014: http://socialmarketing.blogs.com/r_craiig_lefebvres_social/2009/10/social-models-for-marketing-diffusion.html	
11	11/9-11/15	Systems Science	Hammond R. Complex systems modeling for obesity research. Prev Chronic Dis 2009 Jul; 6(3):A97. http://www.cdc.gov/pcd/issues/2009/jul/09_0017.htm Homer J, Milstein B, Wile K, Trogdon J, Huang P, Labarthe D, Orenstein D. Simulating and evaluating local interventions to improve cardiovascular health. Prev Chronic Dis 2010; 7(1):A18. http://www.cdc.gov/pcd/issues/2010/jan/08_0231.htm. Hovmand PS, Ford DN. Sequence and timing of three community interventions to domestic violence. Am J Community Psychol 2009; 44:261-272.	Discussion Board 5 (starts 11/9 – closes 11/22 at 11:59pm)

			Complex Systems (Video): https://www.youtube.com/embed/HeqHtBa9V4A A Change in Thinking (Video): https://www.youtube.com/watch?v=7NCpdLKhY04	
12	11/16-11/22	Lifecourse Perspectives Gender & Health	Chapters 10-12 WHO Information Sheets: http://www.who.int/gender/genderandhealth/en/	Final Review Paper / Evaluation Due
13	11/23-11/29	None	Work on Group Presentation	
14	11/30-12/6	Case Study: Mental Health Integrating biological, behavioral, psychosocial, environmental and policy factors	Chapter 19	Final Group Multimedia Presentation/Peer Evaluation Due Discussion Board 6 (starts 11/30 – closes 12/13 at 11:59pm)
15	12/7-12/13	Case Study Injury and Violence Prevention Integrating biological, behavioral, psychosocial, environmental and policy factors	Chapters 20-21	Peer Feedback and Reflections on Group Presentations Due (using Bb Discussion Board)

CUNY SCHOOL OF PUBLIC HEALTH

PH 75500.01 Urban Health & Society (HYBRID)
Wednesday 6:05-7:50 Silberman 218
Professor Christina Zarcadoolas, PhD

Fall 2015

I. Course Information

Catalogue description: Examines the impact of social, political & economic forces on the health of urban populations and describes roles for and history of public health professionals in promoting health of urban communities.

Course Meets: 6:05-7:50 PM in Room 218
See appended calendar for live classes, asynchronous online and synchronous online class meetings

Instructor: Christina Zarcadoolas, PhD
Email: czarcado@hunter.cuny.edu
Phone: 212-396-7745 (I rarely check messages left on the phone)
Office: My office - Room 537 Silberman Building
Office Hours: By appointment

Required Books:

Ehrenreich, Barbara (2001**)** *Nickel and Dimed: On Not Getting by In America.* NY: Holt.

Freudenberg N, Galea S and Vlahov D. (Eds.) *Cities and the Health of the Public*, Nashville, TN: Vanderbilt University Press, 2006. ISBN: 0-8265-1512-6.

All additional required readings will be posted in BlackBoard. These readings are listed under their respective classes in this syllabus.

II. Program Competencies & Course Objectives

Public Health Core	Course Learning Objectives	Sessions
Listed below are the social and behavioral- related core MPH competencies. This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed as part of the following course sessions:
1. Apply the core functions of public health practice (assessment, policy development and assurance)	• Summarize the history and evolution of the field of social and behavioral health. • State the difference across primary, secondary and tertiary prevention.	Sessions 4, 8
2. Understand basic theories, concepts, models and methods from a range of core and related disciplines and apply them to the design of public health research, policy, and practice	• Compare and contrast different models and theories, including the health belief model, social cognitive theory, community organizational theories, the socio-ecological model, and systems science, with regard to social and behavioral change. • Describe how health and disease are socially constructed. • Summarize basic principles and methods of effective health communication and social marketing to create social and behavioral change. • Summarize the theory of diffusion of innovation. • Justify the relevance of at least one theory from fields others than public health that may inform solutions for a public health problem.	Sessions 2, 3, 8
3. Apply ethical and social justice principles and standards	• Relate contemporary public health problems to power and resource distribution, equity, diversity, sustainability, and intended and unintended consequences of interventions.	Sessions 2, 6 Ethnography Activity
4. Interpret and apply the public health literature	• Conduct a comprehensive literature search and compile the results thereof on a given social and behavioral health issue. • Critique the merits and limitations of a scientific article with relevance to social and behavioral health.	Public Health Brief Literature Review Library Workshop & Library Assignment

5. Communicate public health information verbally and in writing	• Produce scientific writings pertaining to social and behavioral issues in public health.	All assignments
6. Explain key social, behavioral, biomedical and environmental determinants of and inequities in health and disease across the lifespan in urban settings	• Describe the role of poverty, discrimination, and stress in health and disease. • Illustrate how multilevel and systems-oriented interventions can influence individual and population health outcomes. • Illustrate different dimensions of social and health inequity and design solutions that may help to address inequity. • Summarize key features of a life course perspective on health. • Apply different levels of the socio-ecological model to issues such as obesity, mental health, and injury and violence.	Sessions 2, 6
7. Collaboratively engage with diverse groups	• Develop a work plan that demonstrates active and effective collaboration among team members with diverse backgrounds. • Summarize principles of community-based participatory research.	Literature Review Simulated Public Testimony Sessions 3, 10

III. How I will evaluate students – explaining the graded assignments

I will evaluate your understanding and performance will be evaluated through the following:

1. Literature Review (Individual and then Group): Analysis of a contemporary issue of urban public health significance (counts for 2 grades)
2. In class oral participation and Blog posts – contributed throughout the semester
3. Library Assignment
4. Ethnographic Field Activity
5. Nickel and Dimed – in-class activity based on your reading of Ehrenreich's book
6. Final Exam
7. Simulated Public Testimony – last 2 classes of the semester

***1. Public Health Brief: Individual assignment*, due by 11:00 PM Wed. Sept 30 electronically – format specified below (Public Health Brief for Community)**

In this two-page (strict – I will not read beyond 2 page limit) assignment, students will clearly state the significance of an urban public health **topic of special interest to them** that may also be related to a broader topic selected by their group. Please note that this is an individual assignment. Therefore, each student in each group has to submit two pages on their **chosen topic of special interest**. In this way, students will be working on one single topic during the semester, rather than on different ones. This individual assignment will help students practice their writing skills and clarify their own ideas about the subject of interest. In selecting your topic, ask yourself: Why am I interested in this topic? What would I

like to find out about it? Why is this topic relevant from an urban public health perspective? **See the Assignments section of Black Board for further guidance on preparing a Community Public Health Brief**

Students must include a minimum of three (3) references in the Community Public Health Brief and demonstrate a general understanding of the literature on the issue selected and justify its importance from an urban public health perspective. All papers should be typed, double-spaced, spell-checked and proofread. Please use one inch margins all around and Arial 12-point font. A running header must appear on each page in the following format: (Last name- First Name Individual Health Brief (date). The file name must be in the following format: Last name – First Name –Individual Brief).
An electronic only copy of this assignment must be submitted by 11:00PM Tuesday Sept. 29th.

b) ***Group Public Health Literature Review - Group assignment*, due Dec. 13**

In this group assignment, students will summarize and discuss key aspects related to their selected (GROUP) urban public health issue as it has been addressed in the literature. A review article consists of:

- selecting a public health problem,
- reviewing what is currently known and what is still being asked about the problem in the scientific literature, including conflicting findings and gaps that may exist,
- building an argument that will lead to a set of suggestions and recommendations.

Students will write a critical summary of the key ideas, concepts and theories and properly cite each source.

A minimum of 7 references should be cited in this report, including both books and peer-reviewed articles, websites (including the proper citation form for citing web sites). The structure of this review article should include at least the following components:
1) abstract;
2) introduction;
(3) argument/subtopics;
(4) discussion/concluding remarks; and
(5) literature cited.
Papers should be between **7-8 pages/double spaced** in length, **not** including abstract, references, tables or figures. **Electronic submission is required for this assignment with proper header formatting and file name**.

2. **Course blog posts**: by class 2 we will collectively decide if we are going to use a class blog, or contribute to the Blog healthliteracylab.com. Your participation in class and on the blog will account for 20% of your final course grade. Over the course of the semester you will each be responsible for blog posts (comments) to the course blog. Blog posts on the course blog will essentially serve as reaction papers to breaking news, a topic or reading, or activity.
You will be responsible for posting a blog comment at least 8 times during the course.
Each of you will choose a blog nickname (pseudonym), which will allow for you to virtually anonymously post on assigned topics. ***Please make sure to email me your blog pseudonym so that I am able to identify who is writing which blog.***

Blog posts will be graded using a "check-minus," "check," or "check-plus" format Blog posts receiving a "check-minus" are those that appear to be written hastily, without much thought given to the course readings beyond a brief summary and without linking course readings or activities to your daily lives or the ways you have learned about course materials/activities in other settings. Blog posts receiving a "check" are those that respond or comment making use of something learned in this or other classes, but the poster does not expand much beyond a summary format. Blog posts receiving a "check-plus" are those that show a real effort and thoughtfulness, bringing in and referring to theory, models, other research, etc.

3. Library Assignment (due to Prof. Pell TBA)

The purpose of this assignment is to assist students in mastering information literacy research and citation skills, which will help them to identify appropriate resources for writing professional papers. The library assignment is mandatory for all students enrolled in the MPH program and currently taking PH 755. This assignment involves a two-step process:

a. Library Workshop: All MPH students taking PH755 should attend 1 mandatory library workshop. The library sessions will provide students an opportunity to learn and practice the skills needed to complete the library assignme.

Dates for Library Sessions:
SB C08 TUE 09/01/2015 05:45 PM - 08:00 PM
SB C08 WED 09/02/2015 03:45 PM - 06:00 PM
SB C08 THR 09/03/2015 03:45 PM - 06:00 PM
SB C08 TUE 09/08/2015 05:45 PM - 08:00 PM
SB C08 WED 09/09/2015 03:45 PM - 06:00 PM
SB C09 THR 09/10/2015 03:45 PM - 05:55 PM
SB C08 SAT 09/12/2015 09:30 AM - 12:00 PM
SB C08 SAT 09/19/2015 09:30 AM - 12:00 PM

Please use the tutorials posted on the site for the assignment:
http://libguides.library.hunter.cuny.edu/ph755

You can sign up for the workshop by e-mailing Prof John Pell at: jpell@hunter.cuny.edu.

It is recommended that students attend the library workshop, but if unable to do so, you can visit this link to access the on-line tutorials: http://libguides.library.hunter.cuny.edu/ph755

b. Library Assignment: After attending the library sessions, students will complete a written library assignment. The satisfactory completion of this report will count for 10 percent of each student's grade for the PH 755 class. Professors John Pell and Sarah Johnson will be the instructors in charge of the library session and will grade all assignments. Therefore, students' assignments must be submitted electronically to Professor Pell at jpell@hunter.cuny.edu (TBD). Please write "Library Assignment" in the subject heading of your email. Failure to submit the assignment on time will result in a grade of zero.

Professor Pell will be available to meet with students who require additional help to complete the report

satisfactorily. Please contact them directly if you have any questions about the assignment and/or if you want to set an appointment with either of them.

4. Ethnographic Activity: Due Week 4 (NOON). Each student will plan and conduct an observational/ethnographic activity. The activity should last anywhere from ½ hour to 1 hr. The goal of this activity is for you to:

- choose a location or situation that you believe may be give you some insight or understanding of an urban issues linked to health;
- allow you to observe/listen/and record (in some manner) what occurs;
- so that you can reflect on the activity after you leave the field;
- and present your activity and insights in written form (1 page essay) and in oral discussion in class

Due Class 4: Sept 30 NOON Submit electronically 1 page Arial 12/ 1.5 spacing / 1 inch margin. File Name: (Last name_ Ethnography). Emailed to me, czarcado@hunter.cuny.edu

5. Nickel and Dimed book reading activity.

6. Final Exam (take home, distributed **Class 11 Nov 18th due on Class 12 Nov 25**

For this assignment students will provide essay answers to two questions from a list of questions that will address the content of all previous class sessions. The list of questions will be made available on-line the week prior to the midterm exam's due date. Students may refer to any of the class readings, class discussions and additional references that may be suited to the topic under consideration. Critical analysis of the literature, as well as evidence of thorough knowledge of the subject matter, is expected. Students are required to work independently on this exam; this is not a group project. **This assignment must be submitted electronically on the due date of Nov 18**.

7. Simulated Public Health Testimony presented the last 2 class session Dec 3 & 10)

Oral presentations will take the form of a **Simulated Public Testimony**. The goal of a public testimony is to present evidence about a topic and deliver a cogent and convincing argument for action, most often to influence policy decisions in question. Your group will present evidence on your group paper topic and provide arguments for public health action to address the problem.

Students will present as a group on the same day, but each group member will present and be graded separately. Each group member will present a 5-minute oral presentation; once all group members have presented the group will be allowed a 5-minute Q&A session. As in real public testimonies, presentations on individual sub-topics should be coordinated; although they are not always coordinated, they are much stronger when they are. Each group member should present a unique testimony and not repeat information that another group member discusses.

Students will be graded by both the instructor and peers. Students who are not presenting will serve as panel members and be responsible for grading student testimonies and asking informed, constructive questions of the presenters.

Below are the main components of the presentation that each group should plan to address. It is not recommended that they do so, but students may use PowerPoint slides for their presentations. NOTE: If planning to use PowerPoint, students should load all group members' presentations into the same file so we can save time during the presentation.

Following is a suggestion for coordinating public testimonies:

(1) First group member starts with an issue introduction: This should be a brief summary of the issue addressed for your review article which highlights the public health relevance of the issue. Do not get bogged down with too many background details; assume we have basic knowledge of the gravity of most public health problems and how most diseases are transmitted (unless it is unusual or exotic).

(2) Next, group members discuss at least one main subtopic each, including review findings and implications: Describe the main subtopics/issues addressed in your paper. Include relevant evidence from your review and offer specific suggestions for implications, e.g., what are specific action steps you would recommend; provide any insight into interventions, policies or programs which could be implemented.

(3) The final group member finishes with a brief conclusion: Provide a brief, clear, concise concluding statement that summarizes the group's major argument for action.

IV. Grading Policy and Due Dates

Assignment	Group/Individual	Due date(s)	Percent of Final Grade
Class attendance and participation in class & blog	Individual	All Sessions	20%
Individual Lit Review	Individual	Class 3 Sept 16	5%
Group Lit Review	Group	Class 13 Dec 2	10%
Library Assignment	Individual		10%
Urban Ethnography Assignment	Individual		5%
Nickel & Dimed Activity	Individual		5%
Simulated Public Testimony – (oral presentation)	Individual		20%
Group Public Health Review Article	Group		25%

The grading scale is as follows:

A+	97.5%-100%		**B-**	80.0 – 82.4%
A	92.5 – 97.4%		**C+**	77.5 – 79.9%
A-	90.0 – 92.4%		**C**	72.5 – 77.4%
B+	87.5 – 89.9%		**C-**	70.0 – 72.4%
B	82.5 – 87.4%		**F**	0.0 – 69.9%

V. Course Policies

Attendance and class participation: Regular attendance and active, informed participation in class and on-line discussions and exercises based on a critical reading of the assigned articles and text is required. The instructor may distribute short assignments before sessions to guide students; students are strongly encouraged to refer to these assignments when doing weekly required readings. The instructor will also incorporate several in-class or on-line exercises and all students are expected to participate. Some in-class exercises will be collected. Students must also participate in the BlackBoard blog for this course.

Enrollment in BlackBoard: All students must enroll in BlackBoard. BlackBoard will be used on a routine basis as a learning tool to distribute course materials, on-line lectures, as well as to facilitate communication with the instructor and classmates.

Lateness and absence: Timely arrival in class is expected. Please inform me in advance if you anticipate being late or absent. Students are responsible for class content and assignments even if they miss a class. Excessive lateness and absences will be noted and reflected in your final grade.

Assigned readings: Please complete all readings for each class so that you can make the most out of the lecture and discussion.

Guidelines for written assignments: Learning to express ideas in a clear and concise way requires practice; therefore, this course will provide students with diverse written assignments during the term. Start working on papers early and seek feedback from your instructor throughout the process.

Unless otherwise stated by me, all assignments will be submitted electronically. All papers MUST adhere to the following format. If the submissions are not correctly formatted I will not accept them ad this may cause you to receive a late grade.

All papers must be typed double-spaced (at times I ask for other spacing), using Arial 12 font and 1 inch margins throughout. You should have a running header at the top of each page that includes your full name (for individual assignments/ assignment name/ date and page #). The FILE name must include your name and abbreviated title for the assignment. Warning: I am a stickler about these things!

Use only AMA (American Medical Association) style for citing references. You may consult this link at the *American Journal of Public Health* website for AMA guidelines: http://www.ajph.org/misc/ama_references.shtml.

Due dates and completion of assignments: Assignments are due at the beginning of class on the date indicated in the syllabus, unless I state otherwise in BB; two points will be deducted for each day an

assignment is late. If you anticipates the need to turn in work late, please negotiate an acceptable submission plan with the instructor in advance of the established due date. In case of emergencies, please contact the instructor immediately.

Classroom community, culture & conduct: Our classroom and on-line presence is a community. Respectful interaction with classmates, the instructor and guests is expected at all times. Public health deals with controversial issues from multiple perspectives and consideration of these issues may cause disagreements among us or may evoke strong personal feelings, depending on our individual experiences, histories, identities and worldviews. Therefore, in all of interactions and communications, it is important that students strive to demonstrate mutual respect for one another and for any course guests and members of the community with whom they come into contact.

Email correspondence: Direct any inquiries to me via my Hunter email czarcado@hunter.cuny.edu You can expect a response within 8-10 hours Mon–Fri and a bit longer on a weekend or during holiday breaks.

VI. Institutional Policies

Accessibility: Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also included students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. The Office of Disabled Students is located in Student Services, 1128 East Building, 68th Street Campus, (212) 772-4857/TTY (212) 650-3230. For more information visit: http://www.hunter.cuny.edu/studentservices/access). If a student has special accommodations that are necessary for class sessions, exams or presentations, please let the instructor know at the beginning of the semester.

Academic Integrity: Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. For more information, visit: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-academic-integrity .

Help with research and writing: Feedback will be given on the quality of all written assignments. If you require further assistance with improving your writing skills, consider visiting the Student Reading and Writing Center on the main campus. For more information, visit http://rwc.hunter.cuny.edu/ . Hunter has three types of grades of withdrawal: W, WA, and WU. There may be serious academic and financial consequences associated with course withdrawal. Discuss your situation with an Advisor in the Office of Student Services, 1119 East Building or in the Office of Financial Aid, Room 241 North Building. http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-course-withdrawal.

Grade of Incomplete: Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an INCOMPLETE is at the discretion of the instructor. Only students averaging C or above in the course are eligible to request an incomplete course grade. According to Hunter regulations, there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. The student will not be permitted to register for classes in the upcoming semester unless this contract is on file in the UPH office and the instructor advises the Program Director when INC has been resolved.

Grade appeals: When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. Please consult with the instructor within the first three weeks of the following semester. If the student is still not satisfied, s/he should promptly contact the department chair in writing giving the factual reasons and basis for the complaint. Students have the right to request in writing that the chair appoint a student as a member to the department/school Grade Appeals Committee. This appeal at the department/school level must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, please refer to the "College-wide Grade Appeals Procedures" adopted by the Senate in fall 1985. Copies of this procedure may be obtained in the Senate Office, the Office of Student Services, or departmental offices. For more information, visit: h**ttp://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-academic-appeals.**

VII. Course Schedule at a Glance

COURSE AT A GLANCE

NOTE: THIS IS NOT THE DEFINITIVE CONTENT FOR THIS COURSE. IT'S A "SKETCH IN TIME". THE WEEK BY WEEK (IN COURSE MATERIAL) ON BLACKBOARD IS THE ONE AND ONLY RELIABLE SOURCE OF CONTENT.

Session	Date	Topic	Readings and Assignments
1.	**Sept 2** (Class 1) Live	Introductions & Overview of Course: An Urban Public Health Framework Many people in concentrated space: what results Urban Public Health Professionals	**Required reading:** ***Cities and the Health of the Public : Freudenberg, Galea, Vlahov [hereafter, CHP]:*** **Chapter 1** **Plato – Poli excerpt** **Weber, Max. 1969[1921]. "The Nature of the City." Pg. 23-46** **Fine, David. 2000. "Endings and Beginnings: Surviving Apocalypse."** Homework due next week **1. Choose Your Profile/Avatar** **2. Be prepared to discuss a health issues facing NYC** (see BB for specifics)
2.	**Sept 9** (Class) Live	**Theoretical Foundations** **The Social Determinants of Health and Disease** Social Inequalities & Health Inro) Your Avatar – class discussion	**Required readings:** **CHP Chp 3 - Coutts A, Kawachi I. The urban social environment and its effects on health. CHP** **Chp. 9 M. Fullilove Fifty Ways to Destroy a City.** **Geronimus (2000);** **Link & Phelan (1995);** **Galea et al., (2011)** **Cohen 2000 – Broken Windows** Browse: CDC, WHO, US News and Reports, websites Homework: Choose you Public Health Brief Topic Due Class 3.
3.	**Sept 16** (Online-Asynchronous)	**Historical Perspectives on Urban Public Health:** Problems, Research	**Individual Literature Review Due** **Required readings:** **(In CHP) - Chp 7 Rosner, D. Public health in U.S. cities: A historical perspective. 129-142.** **CHP - Chp 14. Methodological Consideration**

		Intro to methods of study	**Galea S, Schulz A.** **Alcabes (2009)** **Krieger, N. Theories for social epidemiology in the 21st century: An ecosocial perspective. *International Journ Epidemiology*. 2001; 30: 669-677.** Broad Street Pump; Optional: Browse CDC Timeline – on website: **HW for next week:** Plan and conduct your urban ethnography activity See Syllabus for specific direction
	Sept 23	NO CLASSES	
4.	**SEPT 30** (Class 4)	Urban Public Health has been Studied: Research Theories & Models Quantitative & Qualitative Study: Where does Journalism fit in?	**Urban Ethnography due today NOON. (see syllabus for direction)** **Required readings:** **Chp 14 Galea S, Schulz A.** **Methodological considerations in the study of urban health.** ***CHP*: Freudenberg – Chapter 15;** **Dresser, Race & Ethnicity** **Students will announce their plan for ethnography act in class.** Optional readings: Morgan, DF. Practical strategies for combining qualitati quantitative methods: Applications to health research. *Qualitative Health Research*. 1998; 8(3): 362-376.
5.	**Oct 7** (Class 5) (Online - Synchronous)	Population: Who lives in Cities? Social Inequalities & Health (cont'd) Migration Immigration Language Culture	**Required readings:** ***CHP*: Chp 2 Changing living conditions; changing health: U.S. cities since World War II.** **Chp. 6 Food, Nutrition & Health of Urban Populations** **CHP 9 - Fifty Way to Destroy a City** **Random Family (excerpt TBA)** Optional Vlahov D, eds. *Cities and the Health of the Public*. Nashville, TN: Vanderbilt University Press; 2006: 143-

			175. Suggested: McCauley LA. Immigrant workers in the United States: recent trends, vulnerable populations, and challenges for occupational health. *AAOHN Journal: Official Journal of the American Association of Occupational Health Nurses.* 2005; 3(7):313-319.
6.	**Oct 14** (Class 6)	Housing, Work & the Physical Environment	**Nickel & Dimed in class graded activity today (TBD)** **CHP Chp. 4** **Klitzman S, Matte TD, Kass DE. The urban physical environment and its effects on health. In: 61-84.** **Duneier M. *Sidewalk*. New York: Farrar, Straus and Giroux; 1999: 43-80.** **LaViest, Place Not Race** **Williams & Collins – Residential Segregation** Suggested: CHP Chp 8. Friedman M. Powell KE, Hutwagner L, et al. Impact of changes in transportation… *JAMA*. 2001; 285(7):897-905.
Library Assignment Due Date Will be Set by J. Pell			
7.	**Oct 21** (Class 7) (Online-Asynchronous)	Prison & Mental Health	**Required Readings** **CHP 12 Ruggiero et al. Traumatic Stressors,** **CHP 13 Galea et al., Mental Health** **Richie, et. A. Reintegrating women leaving jail into urban communities:: 290-303.**

			40 Reasons Why…. **Fraser, Social Justice: health and the vulnerable**. **Achieving Mental Health Parity** <u>Suggested:</u> 1.5 Missing Black Men Stop & Frisk photos
8.	**Oct 28** (Class 8)	**<u>Cities and Complex Emergencies</u>** <u>Floods, Pestilence and</u> <u>Plagues</u>	**<u>Required Reading:</u>** **<u>CHP Chp 11 Vlahov & Gibble, Cities and Infectious Diseases: Controls and Challenges.</u>** **<u>New Orleans: Ten Years After the Storm</u>** **<u>Klinenberg, Eric. 1999. "Denaturalizing Disaster: A Social Autopsy of the 1995 Chicago Heat Wave." *Theory and Society* 28:239-295.</u>** <u>Suggested:</u> Stein and Preuss. 2006. "Oral History, Folklore, and Katrina." Pg. 37-58 in *There is No Such Thing as a Natural Disaster*, Squires and Hartman, eds. Sontag D. In Haiti, global failures on a cholera epidemic. *New York Times*, March 31, 2012.
9.	**Nov 4** (Class 9)	Cities, People & Technology	**Required Readings:** **IOM (2002); Health in All Policies(2013)** **Review-** **PEW Internet and American Life (relevant reports)** **Fox, S. (2013). Health. *Pew Internet*. 2013-01.** **Rice, R.E. (2006). Influences, usage, and outcomes of In-ternet health information searching: multivariate results from the Pew surveys. *Int. J Med. Inf.*, 75(1).** **Greene, J.A., Choudhry, N.K., Kilabuk, E. and Shrank, W.H. (2011). Online social networking by patients with diabetes: a qualitative evaluation of communication with Facebook. *J. Gen. Int. Med.*:**

			26(3): 287-292. **Grimes, A., Landry, B.M. and Grinter, R.E. (2010). Char-acteristics of shared health reflections in a local commu-nity. *Proc. CSCW*, 435-444.** **Zarcadoolas, C., Dodd, SJ, Cohen, N. (in press) Healthcare workers' knowledge and perceptions of their mental health insurance benefits.**
10.	**Nov 11** (Class 10) (Online-synchronous)	**Interventions Individual & Community**	**Required Reading** **CHP Chp. 15 Freudenberg** **Glantz & Bishop** **Shea S, Basch CE, Wechsler H, Lantigua R. The Washington Heights-Inwood Healthy Heart Program: A 6-year report from the field. *American Journal of Public Health*. 1996; 86(2):166-171.** **Stokols D. Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion*. 1996; 10(4): 282-298.**
11.	**Nov 18** (Class 11)	Roles for Public Health Professionals	**Final Exam Distributed. Due next week** **Required Reading** **Institute of Medicine. Who will keep the public healthy? Educating public health professionals for the 21st century. *Brief Report*. The National Academy of Sciences, 2002.** **Stokols D. Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion*. 1996; 10(4): 282-298.**
12	**Nov 25** (Class 12)	The Future Global Perspectives	**Final Exam Due Today** **Required readings**

	(online asynchronous)	Course Review	***CHP*: McGranahan & Satterthwaite - Chapter 10; CHP Chp. 14, Galea.** ***CHP:* Vlahov et al – Chapter 16** **What will happen when Harlem Becomes White?** **IOM 2002**
13	**Dec 3** (Class)	Simulated Public Testimonies	**All Groups Final Health Literature Review Due**
14	**Dec 10** (Class)	Simulated Public Testimonies	

Readings and Assignments may change however you will be given ample warning that they have.

Last Updated Sept. 10, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS
Hunter College
PH 75600: Fundamentals of Health Policy & Management
3 Credits
Fall 2015

Time and location	Fully Online. The course opens on August 27th.
Instructor	Stacey B. Plichta, ScD, CPH. Professor, Hunter College Office: 2180 Third Ave, NY, NY 10035, room 550 Phone: 212-396-7755; 973-873-3789 E-mail: splichta@hunter.cuny.edu (preferred contact)
Office hours	Wednesday 1PM-3PM. Evening and virtual hours by appointment
Course website	Students log into the course website through their Blackboard portal: https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Examination of the organization, delivery and financing of health care in the United States as it pertains to the health policy-making process, including the organization of the agencies and personnel constituting the health care system, and analysis of government structure, laws, and regulations. Theoretical concepts, practice, and implementation of health programs in organized settings, including the planning, administration, management, evaluation, and policy analysis of public health agencies and private sector managed care.
Course prerequisites	N/A
Course format	This is a fully online course that is taught with a mix of online learning resources, narrated lectures, discussion boards, collaborative exercises and individual exercises. All materials are available on the course website. This is not a self-paced course; there are weekly deadlines for discussion and activities.
Required reading and resources	Shi L, Singh DA. (2014). Delivering Health Care in America: A systems approach (enhanced 6th edition). Sudbury, MA: Jones & Bartlett Publishers. Reid TR. (2009). The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care. Penguin Press. McDonough JE (2012). Inside National Health Reform. California/Milbank Books on Health and the Public. Scutchfield DF, Keck CW, Mays G (eds). Principles of Public Health Practice (3rd ed). Clifton Park, NY:Thompson/Delmar Learning, 2009 *(specific chapters are on reserve in the public health/social work library)*
Suggested reading and resources	Suggested articles are posted to Blackboard in each class folder.

Last Updated Sept. 10, 2015

Core Competencies	**Course Learning Objectives**	**Assessment Methods**
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Assess the effects of political, social and economic policies on public health systems and the health of urban population's terms of effectiveness, efficiency and equity. • Discuss political and economic feasibility issues related to health policy • Analyze the impact that current health care policy changes brought by the Affordable Care Act is likely to have on access to health care and the health of the U.S. population.	Discussion boards Op-Ed Piece
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe evidence-based approaches in the development and evaluation of public health policies and interventions • Discuss the function and role of management and the organizational structure of public health organizations • Explain quality and performance improvement concepts employed in public health organizations • Discuss models of leadership and management that are relevant to public health and health care delivery in the U.S.	Quizzes Discussion boards
Adhere to ethical and social justice principles and standards	• Explain the difference between health care systems based on market justice and those based on social justice through a comparison of the U.S. healthcare system to global health systems.	Quizzes Discussion boards Comparative health center visit
Interpret and analyze public health literature and apply evidence-based research	• Prepare documents for use in legislative testimony.	Congressional Testimony
Communicate public health information through oral, written, digital and visual presentation	• Communicate the impact of current and potential policies to the lay public, advocacy groups and policy professionals.	Discussion boards Op-Ed Piece Blog Postings
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Describe the demographic composition, health status and health care utilization patterns of the U.S. population. • Assess the main components of the organization, financing and delivery of health services and public health in the U.S. in terms of quality, prevention, access, cost, equity and effectiveness. • Analyze the impact of individual, organizational, community, national and global trends and interdependencies on public health related problems and health disparities	Quizzes Congressional testimony
Engage and collaborate with diverse groups	• Explain how professional ethics and practices relate to equity and accountability in diverse community settings.	Discussion boards Blog postings
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Describe the legal foundation of public health and the public health policy process, including the role of each level and branch of government in assuring the health of the public. • Assess the main components of, and issues related to, the organization, financing and delivery of health services and public health in the US in terms of equity, access cost and effectiveness.	Quizzes
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Describe health policy formulation, implementation and modification using the Longest model as a framework • Investigate the role of major stakeholders including non-profit and community-based organizations in the policy process and their impact on public health	Quizzes Congressional testimony
Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Explain the basic organization, financing and delivery of health services in the U.S. • Discuss the impact of a lack of access to health care for both individuals and society • Specify the role of public health and other governmental agencies in providing access to care for the U.S. population	Quizzes Congressional Testimony

Course Assessments

Quizzes

There will be on-line multiple choice quizzes that correspond to the readings and the lectures. These will be taken on Blackboard and must be completed in one session (e.g. once you open the quiz, you must complete it). Only one attempt will be allowed. Each quiz will be located in the class folder related to the quiz.

Class Participation and Group Discussion Boards

This class is on-line and has extensive discussion boards (which take the place of in class discussions). It is expected that the student will fully participate in the on-line portion of the course through their group discussion board and through the general class discussion board.

Op-Ed Piece

Working alone, each student will write a 500 word essay suitable for submission to a local newspaper. Students will read and respond to each other's Op-Ed pieces on Blackboard. An Op- Ed essay (those found opposite the editorial page in most newspapers) gives a point of view on an issue of importance. Detailed instructions are in the Assignment section of Blackboard.

Comparative health center visit/write up

Go to two places that deliver health care, one public **AND** one private. Spend an hour or more in each, and fill out the forms given out in class, one form for each visit. Students will post to the Discussion Board one or two paragraphs about the most important differences you observed in the public and private facilities you observed. Your observation forms are due to the instructor via e-mail **(a scanned PDF of your handwritten notes is fine).** Detailed instructions are in the Assignment section of Blackboard.

Blog Postings

You will be directed to three specific health care blogs. You will choose one post from each of them to read and to respond to. You do not actually have to post on the blog (but you can if you want to). Your group will have a group blog. You will post a short (3-5 sentence) summary of the posts you read and your response to each blog post. Each of your responses must be 1-2 paragraphs long (no longer, no shorter) and must state an opinion. You must clearly agree or disagree with the blog, but you must state your reasons why. Spelling and grammar count. Detailed instructions are in the Assignment section of Blackboard.

Congressional Testimony Assignment

Congressional hearings are the principal method by which governmental committees collect and analyze information in the early stages of legislative policymaking. At some point in your career, you may become so proficient in your chosen area of public health that you are asked to be an expert witness at a legislative congressional hearing. Each student group will prepare a short (7-9 page) testimony outlining a position on a given topic. Student groups will also create a one page 'summary of points' page for the other groups to be posted to Blackboard. Detailed instructions are in the Assignment section of Blackboard

Extra Credit Book Review

Students wishing to earn extra credit in the course can choose a book from the list provided and write a 3-5 page review of the book (double spaced, 12pt font, 1" margins) that focuses on how the book has increased their knowledge of public health. You may propose another book, as long as you have not already read the book. The booklist is on Blackboard.

Grading

Evaluation criteria

The quizzes are objective multiple choice tests.

The written activities will be graded with a rubric. You can find the rubric for each assignment on Blackboard.

The relative weight of each course component is as follows:

Weekly quizzes	30%
Participation and group discussion boards	15%
Op-Ed piece	10%
Comparative health center visit/write up	10%
Blog Postings (3)	15%
Congressional Testimony Assignment	20%
Total	**100**
Extra Credit: Book Report	2%
Posting to a health care blog online	1%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Syllabus Change Policy

This syllabus is a guide for the course and is subject to change with advance notice. Changes to the syllabus will be announced in class and posted to Blackboard as an announcement.

Course Communication and Assignment Submission

This course is delivered using the Blackboard course management system. In addition, students may be required to submit course assignments from time to time to the instructor using Hunter e-mail. An active Hunter student e-mail user ID and password is required to log into both systems. An active CUNY e-mail ID is required for non-Hunter students taking the class. It is the responsibility of the student to remain current on this system.

Attendance and class participation

Class attendance in an online class is assessed by participation in the class discussion boards. Class participation is graded (15% of final grade). As such, students should read the subject material prior to participating in their group discussion board. Students are expected to post their work to their group discussion board, read the work of other students and make substantive comments.

Late/incomplete submission of assignments

This is an online course, but it is a paced course. This means that the course assignments have hard deadlines which need to be met in order for you to go forward. The deadlines will come quickly. It is really important to meet these deadlines, as the course is designed so that your fellow students are depending on you to participate. Please note that in an online course, it is almost impossible to give extensions for most assignments. Most missed assignments (such as quizzes and discussion boards) will simply result in a grade of '0'. The larger assignments, such as the OpEd and the Congressional Testimony, will lose 5 points per day of lateness.

Make-ups, rewrites, and extra credit

There are no make-ups or rewrites allowed. There is an extra credit book report opportunity open to all students.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion boards.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations of the Instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 48 hours Monday through Friday. E-mail received on Friday will be responded to on Monday.
- Grading and feedback on assignments within 2 weeks of the due date.
- Communication about grades and progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

PH756: Public Health Policy & Management

Hunter College: Fall 2015 (Schedule is subject to change throughout the semester. Last Updated August 24, 2015)

Date class materials will post	Topics	Materials to Read/View/Listen for the class (also check class folder on Blackboard)	Assignments Associated with this Class Module
Class 1 8/31	**Overview of Health and Use of Healthcare in the U.S.** Scanning the Environment	**READ** Shi & Singh: Chapter 1 and 2 Reid TR. (2009). The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care. Penguin Press (start reading) View materials in Blackboard Class 1 Folder	Quiz 1 by 11:59PM on 9/13. Introduce yourself on the group discussion board by **11:59PM on 9/4** OpEd Assignment: Choose an issue. Write a one-page overview of why your chosen OpEd issue is a problem (1-2 paragraphs) AND describe how you will 'scan the environment' about this issue (1-2 paragraphs). Post to Blackboard on the group discussion board by 11:59PM on 9/13. Read and comment on the posts of your fellow group members.
No Class Labor Day 9/7	**NO CLASS**		
Class 2 9/14	**Global Models of Healthcare Delivery**	**READ** Reid TR. (2009). The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care. Penguin Press (finish reading) View materials in Blackboard Class 2 Folder	Quiz 2 by 11:59PM on 9/20. OpEd Assignment: E-mail draft copy of Op-Ed to instructor by 11:59PM on 9/21
Class 3 9/21	**Health Care Policy** PPACA aka ObamaCare	**READ** Shi & Singh: Chapter 3 McDonough JE (2012). Inside National Health Reform. California/Milbank Books on Health and the Public. Pp103-286 View materials in Blackboard Class 3 Folder	Quiz 3 by 11:59PM on 9/27 Moderated group discussion (9-21 to 9-27): Respond to the group discussion board question by **11:59PM on 9/24**. Comment on your fellow member's postings by 9/27 at 11:59PM.
Class 4 9/28	**Health Care Delivery** Overview of Model Financing and Payment Private Insurance	**READ** Shi and Singh: Chapter 4, Chapter 6 (p195-213) View materials in Blackboard Class 4 Folder	Quiz 4 by 11:59PM on 10/4 OpEd Assignment: Post final copy of Op-Ed to your group discussion board by 11:59PM on 10/4
Class 5 10/5	**Health Care Delivery** Financing and Payment Public Health Insurance Medicaid, Medicare, SCHIP, VA hospitals & clinics	**READ** Text Shi and Singh: Chapter 6 (p214-237) View materials in Blackboard Class 5 Folder	Quiz 5 by 11:59PM on 10/18 Comment on other OpEds in your group by 11:59PM on 10/18

PH756: Public Health Policy & Management

Hunter College: Fall 2015 (Schedule is subject to change throughout the semester. Last Updated August 24, 2015)

Date class materials will post	Topics	Materials to Read/View/Listen for the class (also check class folder on Blackboard)	Assignments Associated with this Class Module
No Class 10/12	**No Class**		
Class 6 10/19	**Health Care Delivery** Providers Health Services Professionals Primary Care/Ambulatory Health Services	**READ** Text Shi and Singh: Chapter 7 View materials in Blackboard Class 6 Folder	Quiz 6 by 11:59PM on 10/25 Blog Post #1 to your group discussion board by 11:59PM on 10/25.
Class 7 10/26	**Health Care Delivery** **Providers** Hospitals and other Inpatient Facilities Managed Care and Integrated Organizations	**READ** Text Shi and Singh: Chapter 8, Chapter 9 View materials in Blackboard Class 7 Folder	Quiz 7 by 11:59PM on 11/1 Read and comment on the blog posts of your group members by 11:59PM on 11/1
Class 8 11/2	**QPACE:** Quality Prevention Access Cost Equity Efficiency	**READ** Text Shi: Chap 12: Cost, Access and Quality View materials in Blackboard Class 8 Folder	Quiz 8 by 11:59PM on 11/8 Post your 1-2 paragraph health care facility comparison summaries to the **CLASS** discussion board by 11:59 on 11/8 Health Care Comparison Assignment: Sheets to be e-mailed to instructor. Handwritten and scanned is fine.
Class 9 11/9	**Public Health System** Structure of the U.S. Government The U.S. Public Health System Federal, state and local health activities	**READ** Text Scutchfield: Chap 8-10 The Federal, State and Local Contribution to Public Health View materials in Blackboard Class 9 Folder	Quiz 9 by 11:59PM on 11/15 Read and comment on at least 5 health care facility comparison summaries by 11:59PM on 11/15. Blog Post #2 posted to your group discussion board by 11:59PM on 11/15
Class 10 11/16	**Health Policy** Policy Process	**READ** Text Shi & Singh: Chapter 13 View materials in Blackboard Class 10 Folder	Quiz 10 by 11:59PM on 11/22 Read and comment on the blog posts of your group members by 11:59PM on 11/23

PH756: Public Health Policy & Management

Hunter College: Fall 2015 (Schedule is subject to change throughout the semester. Last Updated August 24, 2015)

Date class materials will post	Topics	Materials to Read/View/Listen for the class (also check class folder on Blackboard)	Assignments Associated with this Class Module
Class 11 11/23	**Health Policy** Health Policy formulation and implementation	**READ** Text McDonough pp 19-99 View materials in Blackboard Class 11 Folder	Quiz 11 by 11:59PM on 11/29 Moderated group discussion (11/23 to 11/30): Respond to the group discussion board question by **11:59PM on 11/25**. Comment on your fellow member's postings by **11/30 at 11:59PM**.
Class 12 11/30	**Management:** Management of Public Health Organizations	**READ** Text Scutchfield: Chap 15: Management of PH Organizations, Chap 18: Leadership in PH Practice View materials in Blackboard Class 12 Folder	Quiz 12 by 11:59PM on 12/6 Blog Post #3 due posted to your group discussion board by 11:59PM on 12/7
Class 13 12/7	**Leadership** Assessment and Strategic Planning. Performance Assessment and Management	**READ** Text Scutchfield: Chap 16:Performance Measurement and Management in Public Health Chapter 18: Leadership in Public Health Practice View materials in Blackboard Class 13 Folder	Quiz 13 by 11:59PM on 12/13 Read and comment on the blog posts of your group members by 11:59PM on 12/13 Leadership self-assessment/growth plan due by 11:59PM on 12/14
Class 14 12/14	**Student Presentations Due Today**	Online Group presentations of Congressional Testimony View materials in Blackboard Class 14 Folder	Congressional Testimony one-page review and PPT due on 12/14 by 11:59PM posted to the CLASS discussion board
Class 15 12/21	**Student Final Group Papers are Due today**	View materials in Blackboard Class 15 Folder	

MPH HPM SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

Hunter College
PH 77049: Advanced Health Economics
79579
Fall 2015
3 credits

Catalogue description	This course will focus on economic issues of particular importance to those interested in health care management, especially organizational and labor economics. Topics covered will include competition and consolidation in health care markets, adverse selection and moral hazard, provider agency, and labor market effects of health insurance.
Course meets	Tuesday, 6:05-7:50 pm, Silberman 212
Instructor	Alexis Pozen, Ph.D.
Email	alexis.pozen@sph.cuny.edu
Phone	646-664-8361
Office	55 W 125th St, 8th Floor
Office hours	By appointment
Required materials	Readings are available [online] through the CUNY library and will be posted on Blackboard.
Recommended books	For those seriously interested in health economics: Culyer AJ, Newhouse JP. Handbook of Health Economics, Vol 1A. and 1B Elsevier, 2000.

Course Policies

Grading

		Dates
20%	Group presentation	10/13; 10/20
30%	Individual paper critique 1	11/17
30%	Individual paper critique 2	12/14
20%	Class participation	
100%		

Attendance and class participation

As class discussion will be key to learning in this course, attendance is required. Please notify me at least one week in advance if you will not be able to attend class. Your meaningful participation will contribute not only to your own understanding of the material, but to others' as well. Please come to class having done readings and ready to ask and answer questions.

Late submission of assignments

Late assignments will be marked down a half letter grade (or 5 percentage points) for every day late.

Class citizenship & rules of conduct

Please come to class on time, and let me know in advance if you need to come late or leave early. I don't mind if you use laptops in class, but please limit use to note-taking to avoid distracting others. Remember to turn off your cell phones.

Email correspondence

Feel free to email me any time at alexis.pozen@sph.cuny.edu with any questions or concerns about the course, related material, the program, research, etc., and I will get back to you as soon as possible. Remember, office hours are by appointment, and I encourage meetings!

Institutional policies

Accessibility

Special accommodations for students with disabilities are available through the campus disability services offices. Please contact them, and they will inform me of the appropriate accommodations to make. More information about campus disability services is available here: http://www.cuny.edu/about/administration/offices/sa/services/disabilities/student-info.html

Academic integrity

"The Graduate Center of the City University of New York is committed to the highest standards of academic honesty. Acts of academic dishonesty include—but are not limited to—plagiarism (in drafts, outlines, and examinations, as well as final papers), cheating, bribery, academic fraud, sabotage of research materials, the sale of academic papers, and the falsification of records. An individual who engages in these or related activities or who knowingly aids another who engages in them is acting in an academically dishonest manner and will be subject to disciplinary action in accordance with the bylaws and procedures of the Graduate Center and of the Board of Trustees of the City University of New York.

"Each member of the academic community is expected to give full, fair, and formal credit to any and all sources that have contributed to the formulation of ideas, methods, interpretations, and

findings. The absence of such formal credit is an affirmation representing that the work is fully the writer's. The term "sources" includes, but is not limited to, published or unpublished materials, lectures and lecture notes, computer programs, mathematical and other symbolic formulations, course papers, examinations, theses, dissertations, and comments offered in class or informal discussions, and includes electronic media. The representation that such work of another person is the writer's own is plagiarism.

"Care must be taken to document the source of any ideas or arguments. If the actual words of a source are used, they must appear within quotation marks. In cases that are unclear, it is the responsibility of the writer to take due care to avoid plagiarism.

"The source should be cited whenever:

(a) a text is quoted verbatim

(b) data gathered by another are presented in diagrams or tables

(c) the results of a study done by another are used

(d) the work or intellectual effort of another is paraphrased by the writer

"Because the intent to deceive is not a necessary element in plagiarism, careful note taking and record keeping are essential in order to avoid unintentional plagiarism."

Source: CUNY Graduate Center Student Handbook, 2014-15, Available at: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf

Academic dishonesty will be treated on a case-by-case basis. Penalties may include imposing a failing grade on the assignment, imposing a failing grade in the course, or termination from the program.

Grade of incomplete

It is my policy to not give a grade of incomplete. You are expected to complete all assignments on time, with exception of grave emergency, as noted above under assignments. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

SCHEDULE

Session	Date	Topic	Readings and Assignments
1	9/1	Econ and health econ refresher	Arrow K. Uncertainty and the welfare economics of medical care. American Economic Review 1963; 53(5): 941-973. American Economic Review 1963; 53(5): 941-973. Difficult reading, but a classic! If you haven't read this paper by the first class, be sure to catch up in the first week or two as we will be constantly referencing it.
2	9/8	Adverse selection	Newhouse JP. Reimbursing health plans and health providers: efficiency in production versus

			selection. Journal of Economic Literature 1996; 34: 1236-63. Cutler DM and Reber S. Paying for health insurance: the tradeoff between competition and adverse selection. Quarterly Journal of Economics 1998; 113: 433-66. Brush up on Arrow, esp. pp. 945-46; 963-64
3	9/15	NO CLASS	
4	9/25	FRIDAY CLASS – no class 9/22 Moral hazard - demand	***Group presentation assigned*** Pauly MV. The economics of moral hazard: comment. American Economic Reivew 1968: 58; 3: 531-7. Arrow KJ. The economics of moral hazard: further comment. American Economic Review 1968; 58: 537-9. Manning WG, Newhouse WP, Duan N, et al. Health insurance and the demand for medical care: evidence from a randomized experiment. The American Economic Review 1987;

			77: 251-277. Brush up on Arrow, esp. pp. 945-46; 961-62
5	9/29	Moral hazard - supply	Gruber J, Owings M. Physician financial incentives and cesarian section delivery. RAND Journal of Economics 1996; 27(1): 99-123. Brush up on Arrow, esp. pp. 949-54; 955-58; 965-67
6	10/6	Health and the labor market	Summers LH. Some simple economics of mandated benefits. The American Economic Review 1989; 79: 177-83. Gruber J. The incidence of mandated maternity benefits. American Economic Review 1994; 622-41.
7	10/13	Presentations	
8	10/20	Presentations	
9	10/27	The role of non-profits in health care	***Individual paper critique 1 assigned*** Frank RG, Salkever DS. Nonprofit Organizations in the health sector. Journal of Economic Perspectives 1994; 8(4): 129-144. Dafny L, Ramanarayanan S. Does it matter if your health insurer is for-profit? Effects of ownership on premiums, insurance coverage, and medical spending. NBER Working Paper No. 18286. November 2013. Horwitz JR, Nichols A. What do nonprofits

			maximize? Nonprofit hospital service provision and market ownership mix. NBER Working Paper No. 13246. July 2007.
10	11/3	Horizontal consolidation and competition	Baker LC. Measuring competition in health care markets. Health Services Research 2001; 36: 223-251. Kessler DP, McClellan MB. Is hospital competition socially wasteful? Quarterly Journal of Economics 2000; 115: 577-615. A very difficult paper, but another classic!
11	11/10	Monopsony power: insurers as double-edged competition swords	Pauly MV. Managed care, market power, and monopsony. Health Services Research 1998; 33(5): 1439-1460. Moriya AS, Vogt WB, Gaynor M. Hospital prices and market structure in the hospital and insurance industries. Health Economics, Policy, and Law 2010; 5(4): 459-79. Trish EE, Herring BJ. How do health insurer market concentration and bargaining power with hospitals affect health insurance premiums? Journal of Health

			Economics 2015; 42: 104-114.
12	11/17	Vertical consolidation	***Individual paper critique 1 due; individual paper critique 2 assigned*** Williamson OE. The vertical integration of production: market failure considerations. American Economic Review 1971; 61(2): 112-23. Ciliberto F, Dranove D. The effect of physician-hospital affiliations on hospital prices in California. Journal of Health Economics 2006; 25: 29-38. Frakt AB, Pizer SD, Feldman R. Plan-provider integration, premiums, and quality in the Medicare Advantage market. Health Services Research 2013; 48: 1996-2013.
13	11/24	Econ in health policy: legalizing vices	Manning WG, Keeler EB, Newhouse JP, Sloss EM, Wasserman J. The taxes of sin: do smokers and drinkers pay their way? JAMA 1989; 261: 1604-1609 Anderson DM, Hansen B, Rees DI. Medical marijuana laws, traffic fatalities, and alcohol consumption. Journal of Law and Economics 2013; 56: 333-69. DiNardo J, Lemieux T. Alcohol, marijuana, and American youth: the unintended consequences of government regulation.

			Journal of Health Economics 2000; 20: 991-1010.
14	12/1	Econ in health policy: recessions and health	Modrek S, Stuckler D, McKee M, Cullen MR, Basu S. A review of health consequences of recessions internationally and a synthesis of the U.S. response during the great recession. Public Health Reviews 2013; 35(1). Epub ahead of print. Ruhm CJ. Recessions, healthy no more? Journal of Health Economics 2015; 42: 17-28.
15	12/8	Econ in health policy: does prevention save money?	***Individual paper critique 2 due*** Grosse SD, Teutsch SM, Haddix AC. Lessons from cost-effectiveness research for United States public health policy. Annual Review of Public Health 2007; 28: 365-91. McClellan M, Rivlin AM. Improving health while reducing cost growth: what is possible? Brookings, 2014. Cohen JT, Neumann PJ, The cost savings and cost-effectiveness of clinical preventive care. Robert Wood Johnson Foundation, 2009.

Health Policy and Management Specialization Competencies	Course Learning Objectives	Assessments
This course will help you achieve increased competency in health policy and management. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed with the following assessments
Apply economic concepts and theories to the analysis of health care policy and management issues that inform decision-making and policy development	Analyze basic microeconomic models of household and organizational behavior in health, medical care, and health insurance, and make connections across these models	Students will collaborate in presenting a critique of a health economics paper and individually critique papers in health economics papers; policy relevance in these assignments must be addressed
Apply relevant theoretical/conceptual models and leadership principles to developing health policy and administrating health programs Evaluate public health programs and health policies and apply evaluation results to their improvement	Use microeconomics as a framework for decisionmaking in health policy Understand strengths and weaknesses of health care policies and reforms, and identify potential unintended effects on various populations and sectors of the economy	In the critiques described above, the pros and cons of economic policies will be evaluated, including economic tradeoffs and feasibility
Identify non-public health policies and describe how they can mitigate or exacerbate health disparities and influence the health of urban populations Identify and analyze the legal, economic, ethical and health bases and implications of public health policies that affect urban populations	Identify how non-health policies might affect health, medical care, or health insurance; and how health policies might affect non-health sectors, such as transportation, the environment, housing and employment	In the critiques described above, the intersectoral effects of economic policies will be evaluated, including effects on education, transportation, and so on, as well and legal and ethical implications
Analyze and critically evaluate theoretical and conceptual models used to describe the U.S. health care system and the delivery of health care	Critique strengths, limitations, and assumptions of health economics and policy literature Understand key incentives and tradeoffs involved in individual and organizational decisionmaking in health and health care; and how those tradeoffs and cognitive mistakes drive behavior	The critiques will highlight the basis of economics, the tradeoffs and incentives faced in patient and provider choice, and in behavioral mistakes driving these incentives.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Lehman College
PHE 600: Biostatistics in Public Health
3 Credits
Fall 2015

Time and location	Wednesday, 6:00 pm – 8:40 pm, 125 Carmen Hall
Instructor	Dr. Glen Johnson, Associate Professor **glen.johnson@lehman.cuny.edu** (preferred communication method)
Office hours	Wednesday 3:30-5:00 pm, Thursday noon-1:30 pm, or by appointment, in 413 Gillet Hall
Course website	See "2015 Fall Term Biostatistics in Public Health PHE 600 XW81" at https://bbhosted.cuny.edu
Support resources	Lehman College has two tutoring centers on campus. The **Academic Center for Excellence (ACE)** provides appointment-based and drop-in tutoring in the humanities, social sciences and writing, as well as general writing skills. The **Science Learning Center (SLC)** provides drop-in tutoring for natural and computer science courses. To obtain more information about the ACE and SLC, please visit their website at http://www.lehman.edu/issp, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707.
Course description	Application and interpretation of basic descriptive and inferential statistical methods in the analysis of public health data.
Course prerequisites	N/A
Course format	Lecture, computer lab, in-class assignments and homework
Required reading and resources	Gerstman, B.B. *Basic Biostatistics: Statistics for Public Health Practice*. 2015. Jones & Bartlett. Boston, MA.
Suggested reading and resources	• Rosner, B. Fundamentals of Biostatistics, 7th Edition. 2011. Cengage. ISBN-10: 0538733497 • https://www.khanacademy.org/math/probability • Search for more online sites

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Design an appropriate statistical analysis for a given public health research design	• Term Paper • Exam 2 • Final Exam
Apply basic statistical and informatics techniques	• Perform statistical calculations using a statistical software package • Create graphics and visual representations of statistical data using a statistical software package • Apply appropriate statistical analysis techniques based on the size of the data	• Term Paper • Exam 1 and 2 • Final Exam
Communicate public health information through oral, written, digital and visual presentation	• Write the interpretation of results from statistical analysis • Create and present an oral presentation of statistical output	• Term Paper
Collect, analyze and interpret public health data	• Identify continuous, discrete, nominal and ordinal data • Summarize these data types using • Bar charts, box plots, histograms, scatter plots • Measures of central tendency: mean, median, and mode of measures of spread: variance, interquartile range, range of frequency tables • Define and differentiate between precision and accuracy • Define and calculate marginal, joint and conditional probability • Use binomial distribution to calculate probabilities associated with binary data	• Exam 1 and 2 • Final Exam • Term Paper

	• Convert count data to rates and proportions • Estimate centrality and variance of a sampling distribution from the population distribution using the Central Limit Theorem • Construct and interpret confidence intervals for: • Population mean and population proportion • Large and small samples (using z and t sampling distributions) • Identify how changes in sample size, confidence level and other parameters affect the width of a confidence interval • Define null and alternative hypotheses for one-sided and two-sided inference • Perform inference tests for proportions using the normal approximation, for mean of a single sample, difference in means of two samples, and difference in means of paired samples • Use Z and t tables for hypothesis tests and constructing confidence intervals • Estimate the power of a t test • Calculate odds ratios, relative risks, and risk difference • Perform Pearson Chi-Square Test of Independence for r x c frequency tables • Perform and interpret one-way Analysis of Variance • Correct for multiple comparisons • Define type I and II error, power, and sample size and the relationships between them • Perform and interpret correlation and linear regression analysis	

Course Assessments
Understanding of the course material will be evaluated through:

Assignments. Selected problems at the end of each assigned chapter should be completed. Any supplemental problems assigned by the instructor also need to be completed. Homework counts toward your grade (15%) and if you are unable to do the homework you will have difficulty completing the midterms and final exam. A term project will also be assigned, which counts as 15% of your grade. The assignments component of the course has a total value of 30%.

Exams. The two exams (20% each) and the final (25%) exam are based on information from assigned readings, lecture materials and homework. There will be no re-takes or additional work for failed exams. There will be no make-up dates for tests, except in case of emergency supported by written documentation. All exams will be open-book. The final will be cumulative.

Class attendance. Students are required to attend class and participate in class discussions, counting for 5% of the grade. Attendance will be taken at the beginning of each class.

Grading
The relative weight of each course component is as follows:

Assessment	*Weight*
Assignments	30%
Mid-Term Exams (2)	40%
Class participation and Attendance	5%
Final exam	25%
	100%

The grading system for the course follows guidance in the Graduate Bulletin:

Percentage	Letter Grade	Quality Points
94-100	A	4.0
90-93	A-	3.7
87-89	B+	3.3
84-86	B	3.0
80-83	B-	2.7
77-79	C+	2.3
70-76	C	2.0
69 and below	F, WU	0

Withdrawal

The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete

The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing, giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

Students are expected to attend classes regularly, and instructors are required to record attendance for grading and counseling purposes. Individual instructors, as well as departments or degree programs, may establish specific attendance requirements. Instructors have the right to weigh attendance and class participation in determining grades. It is the student's responsibility to ascertain the effect attendance may have on their grade in a course. Students receiving financial aid must be certified as attending classes regularly for continuing eligibility.

Academic Integrity

While you are encouraged to discuss ideas with each other to facilitate your learning experiences, the work that is turned in must be your own. For example, allowing someone to copy your work, passing or sharing your answers to others, and/or doing work for others (including computer assignments) are examples of violations of Academic Integrity. For more information please visit and read the University of California Davis website (http://sja.ucdavis.edu/academic-integrity.html) or visit the Center for Academic Integrity at Clemson University (http://www.academicintegrity.org) for a detailed description of academic integrity. One of the more common and more

destructive breaches of academic integrity is plagiarism. Visit the Plagiarism.org Learning Center (http://www.plagiarism.org) for more information on how to avoid plagiarism. The concerns and guidelines provided in these websites will be seriously applied in this course. The complete text of the CUNY Academic Integrity policy can be found at this site:
http://web.cuny.edu/academics/info-central/policies/academic-integrity.pdf

Accessibility

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Lehman College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/ or Learning) consult the Office of Special Student Services in the Division of Student Affairs. The Office of Special Student Services is located in Shuster Hall, Room 238, Tel. (718) 960-8441, TTY (718) 960-8931.

Syllabus Modification

The instructor may modify the syllabus and study plan.

Course Schedule

Session	Date	Topic	Readings and Assignments
1	09/02/15	• Types of data • Basic study designs • Data presentation	Gerstman: Chapters 1 (p. 1-14), 2 (p. 21-41) and 3 (p. 43-68) Exercises: 1.1-1.8, 1.10-1.11, 2.1, 2.5, 3.5
2	09/09/15	• Numerical summary measures • Introduction to term project	Gerstman: Chapter 4 (p. 77-99) Exercises: 4.1-4.14
3	09/16/15	• Introduction to Probability • Binomial distribution	Gerstman: Chapters 5 (p. 105-128) & 6 (p. 133-141) Exercises: 5.1-5.7, 5.8 (a & b), 5.10-5.12, 6.1-6.5, 6.7, 6.8
	09/23/15	**No Class**	
4	09/30/15	• Normal distribution • Introduction to statistical inference	Gerstman: Chapters 7 (p. 147-163) & 8 (p. 175-190) Exercises: 7.1-7.10, 8.1, 8.3, 8.5, 8.6, 8.7, 8.9
5	10/07/15	**Exam 1 – in class**	
6	10/14/15	Introduction to hypothesis testing and confidence intervals	Gerstman: Chapters 9 and 10 Exercises: 9.1-9.13, 10.1-10.9
7	10/21/15	• Inference about a mean • Comparing two means	Gerstman: Chapter 11 and 12 Exercises: 11.1-11.7, 11.11, 11.12, 11.13a, 11.14-11.18, 12.1-12.3, 12.6, 12.19, 12.20
8	10/28/15	One-way ANOVA	Gerstman: Chapter 13 (p. 295-316) Exercises: 13.1-13.6
9	11/04/15	**Exam 2 – in class**	
10	11/11/15	Inference about a proportion	Gerstman: Chapter 16 Exercises: 16.1-16.5, 16.9-16.10, 16.19, 16.20, 16.24
11	11/18/15	Comparing two proportions & Contingency tables	Gerstman: Chapters 17 (p. 423-437) & 18 (p. 459-482) Exercises: 17.1, 17.2, 17.3 (a, b), 17.4, 17.5, 17.7(a), 17.8, 18.3, 18.4, 18.6, 18.9 (a), 18.10
12	11/25/15	Correlation & Linear Regression	Gerstman: Chapter 14 (p. 333-465) Exercises: 14.1 (a,b) and 14.3 (a,b,c)
13	12/02/15	Reading a Journal Article	Assigned Readings **Term projects due**
14	12/09/15	Review and Practice	
15	12/16/15	**Final Exam**	

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Lehman College
PHE 700: History and Philosophy of Public Health
3 Credits
Fall 2015

Time and location	Mondays, 6-8:40pm Lehman College, location TBA
Instructor	Emma K. Tsui, PhD, MPH emma.tsui@lehman.cuny.edu (preferred mode of communication) 347-577-4038 Gillet Hall, Room 422D
Office hours	Mondays 4:30-5:30pm and Thursdays 3:30-5:30pm (walk-in) and other times by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available. Lehman's Academic Center for Excellence (ACE) provides appointment-based and drop-in tutoring and general writing and academic skills workshops. To obtain more information about the ACE, please visit http://www.lehman.edu/issp or call the ACE at 718-960-8175.
Course description	Examination of historical development and philosophical concepts underlying the practice of public health; social, political, and institutional forces shaping public health policy and the commitment to monitor, protect, and promote the public's health; emphasis on the relationship between public health knowledge, values, and actions.
Course prerequisites	N/A
Course format	In-person lecture and discussion-based sessions
Required reading and resources	Hives of Sickness: Public Health and Epidemics in New York City. Edited by David Rosner (New Brunswick, N.J.: Rutgers University Press, 1995). Price: $30.29, Amazon Available on reserve at the Leonard Lief Library Institute of Medicine. The Future of the Public's Health in the 21st Century. Free download at: http://www.iom.edu/Reports/2002/The-Future-of-the-Publics-Health-in-the-21st-Century.aspx Other articles as assigned under "Schedule".
Suggested reading and resources	See listing under "Schedule"

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Communicate public health information through oral, written, digital and visual presentation	• Summarize a peer-reviewed journal article • Synthesize peer-reviewed journal articles on a specific topic • Trace and discuss the historical development, themes and ongoing controversies in the field of public health	All assessment methods
Collect, analyze and interpret public health data	• Use electronic databases to gather public health information	Journal article summaries, annotated bibliography, and synthesis paper
Interpret and analyze public health literature and apply evidence-based research	• Summarize a peer-reviewed journal article • Synthesize peer-reviewed journal articles on a specific topic	Journal article summaries, annotated bibliography, and synthesis paper

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*

Analyze critical health inequalities confronting urban populations by social and economic determinants such as race, ethnicity, income and neighborhood	• Trace and discuss the historical development, themes and ongoing controversies in the field of public health	Participation in class discussions
Identify aspects of public health ethics and values of social justice that affect public health practice and decision-making	• Define, understand and discuss the philosophical orientation of public health • Trace and discuss the historical development, themes and ongoing controversies in the field of public health	Participation in class discussions, presentation on a historical figure
Synthesize theories, methods and practice of public health to address income inequities within communities	• Trace and discuss the historical development, themes and ongoing controversies in the field of public health	Participation in class discussions, synthesis paper

Course Assessments
The following assignments are meant to give you a chance to practice and develop expertise in skills that are fundamental to the forms of public health research and writing that you will be doing throughout the MPH program. These include: 1) understanding and summarizing the key points of public health journal articles, 2) searching the public health literature to find articles on a given topic, and 3) synthesizing what you've learned from those articles. These are critical skills for succeeding in the program and as a public health professional. We have designed these assignments to be clear, manageable, and short. This means we expect that all of your work will be thoughtful and of the highest quality.

Journal Article Summaries (2)
You will practice reading an assigned journal article, summarizing and writing up its key points, using the guidelines and practices discussed in class. You will receive feedback from your first journal article summary and you are expected to put this feedback to use when writing your second journal article summary.

Annotated Bibliography
For this assignment, you will conduct a search of the literature on one of three topics. You will receive guidance from our health sciences librarian on how to effectively search the scientific literature. Using the articles you find that are most closely related to your topic, you will construct an annotated bibliography of at least 6 articles. This is an extremely small bibliography and the goal is to choose high-quality, well-targeted articles that can be synthesized into a short paper on your chosen topic.

Synthesis Paper
In a paper of 400-800 words, **synthesize** what you learned about your topic. Doing well on this assignment requires that you integrate findings from all of your sources and that you do not merely report findings of different studies sequentially. If you find that any articles from your bibliography cannot be synthesized comfortably into your paper, then you can replace them with more suitable articles.

Presentation on a PH historical figure/topic
You will give a presentation of 5-10 minutes on a public health historical figure/topic, using the rubric presented in class for guidance.

Grading
Evaluation criteria
Grading rubrics will be provided via the course website for course assignments.

The relative weight of each course component is as follows:

Assessment	Weight
Participation in class discussions/attendance	15%
Journal Article Summaries (2)	25%

Annotated Bibliography	25%
Synthesis Paper	25%
Presentation on a PH historical figure	10%
	100%

The grading system for the course follows guidance given by the Lehman College Department of Health Sciences:

Letter Grade	Points
A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
F	< 70%

Withdrawal

The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete

The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full

semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

All members of the class are expected to actively participate in class lectures, activities, and discussions, and to complete assigned reading **and other assigned activities** prior to class. Attendance means more than just showing up; it means doing the reading and, more importantly, actively engaging with the ideas and issues brought up in the reading and in class. Your comments, questions and opinions are essential ingredients for making this course a challenging and rewarding experience for your classmates as well as for yourself, and it is expected that you come prepared to make this contribution. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible. Points may be deducted for absences, tardiness, or leaving class early.

Late/incomplete submission of assignments

I expect that all assignments that are not to be completed in class will be submitted to me via email or Blackboard by midnight on the due date (usually the night before a class session). Assignments submitted after the due date will have half a letter grade deducted for each day that the assignment is late, except in cases of significant medical issues or other serious situations.

Make-ups, rewrites, and extra credit

Make-up assignments will not be allowed in this course, nor will rewrites. Extra credit assignments may be made available to students as opportunities during the semester present themselves.

Expectations of students

I expect the classroom to serve as a space of respect and collaborative learning and that the course assignments will help you to develop specific skills. To that end, I expect that:

- you will arrive on time and stay for the entire class
- you will not use cell phones during class, except during breaks
- you will visit our Blackboard site frequently, as that will be our primary way of communicating with one another outside of class. Class announcements and supplemental materials will be posted there frequently. Course announcements will also be sent out using the Lehman e-mail system. If you have any questions about your Lehman email address or your password, or if you have any problems accessing the site, please call the computer helpdesk at 718-960-1111.
- your writing for assignments will be of high quality, presented in a readable and consistent manner: double-spaced, typewritten, with one-inch margins all around, and **proofread**.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during in-class discussions
- Respond to student email within 24 hours Monday through Friday.
- Grading and feedback on assignments within 2 weeks of the due date.

Accessibility

Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, at 718-960-8441.

Academic integrity

The faculty and administration of Lehman College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Lehman College procedure for implementing the policy can be found in the Graduate Bulletin.

Course Schedule

Please note that the schedule and assignments listed below are subject to change. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. Opportunities for group/individual work may be scheduled during some sessions. All readings that are not part of the required text will be available via Blackboard. For important dates (e.g., course drop and withdrawal), please refer to Lehman's graduate academic calendar: http://www.lehman.edu/registrar/calendars.php.

	Date	**Topic**	**Readings and Assignments** (Required unless labeled "recommended")
1	8/31	Introduction to the course	• P.H.101: Chap. 1 Public Health: The Population Health Approach • 10 Public Health Achievements, United States, 1900-1999 • 10 Public Health Achievements, United States, 2000-2010 *Recommended* • Glass, et al. "Causal Inference in Public Health," Annu. Rev. Public Health (2013). 34:61-75.
	9/7	**No class (Labor Day)**	

2	9/10	Health equity & inequity	• IOM Report: Chap. 1 pp. 19-45 • Phelan, J. Link, B, and Tehranifar, P. "Social Conditions as Fundamental Causes of Health Inequalities: Theory, Evidence, & Policy Implications," Journal of Health and Social Behavior (2010): 41S S28-S40. *Recommended* • Raphael, Dennis. "Public policies & the problematic USA population health profile". Health Policy. 84 (2007): 101-111. • Marmot, M.G. "Inequalities in Health," New England Journal of Medicine (12 July 2001): 134-136.
	9/14	**No class**	
3	9/21	Changing patterns of health and illness (*1918 Influenza* video)	• Rothstein, William G. "Trends in Mortality in the Twentieth Century," reprinted in Lee and Estes, The Nation's Health, 7th ed. pp. 11-30. • "Achievements in Public Health, 1900-1999: Control of Infectious Diseases," Lee and Estes, The Nation's Health, 7th ed. pp. 31-37. *Recommended* • Schroeder, SA. "We can do better – improving the health of the American people." NEJM. 2007; 35: 1221-8. (Blackboard) **Journal article summary #1 due by midnight on September 20th**
4	9/28	How to search for articles	Meet in Library Lobby **Complete online library assignment**
5	10/5	Location as a social determinant of health I: Urban health then and now	• IOM Report: Chap. 2, pp. 46-95 • Hives of Sickness: Intro pp.1-21: and Condran, "Changing Patterns of Epidemic Disease in New York City", pp. 27-41
	10/12	**No class (Columbus Day)**	
6	10/19	Responding to epidemics (*Typhoid Mary* video)	• Hives: Leavitt, "Be Safe. Be Sure" New York City's Experience with Epidemic Smallpox", pp. 93-114. • Hives: Rogers, "A Disease of Cleanliness:

			Polio in New York City, 1900-1990", pp. 115-130. **Journal article summary #2 due by midnight on October 18th**
7	10/26	Whose view matters? Community perspectives on public health problems	• IOM Report, Chap. 4, pp. 178-211 • Barbara Israel et.al. "Review of Community-based Research: Assessing Partnership Approaches to Improve Public Health", Annual Review of Public Health, 1998, 19(1):173-203.
8	11/2	Race as a social determinant of health: The Case of Tuskegee (*Deadly Deception* film)	• Allan Brandt, "Racism and Research: The Case of the Tuskegee Syphilis Study: The Hastings Center Report, Dec. 1978, 8(6):21-29. • Hives: Kraut, "Plagues and Prejudice: Nativism's Construction of Disease in Nineteenth- and Twentieth-Century New York City", pp. 65-90.
9	11/9	Public health & political activism: The Case of HIV/AIDS	• Hives: Ronald Bayer, "The Dependent Center: The First Decade of the AIDS Epidemic in New York City", pp. 131-150. • Allan Brandt "AIDS in Historical Perspective: Four Lessons from the History of Sexually Transmitted Diseases" American Journal of Public Health, 1988, 78(4): 367-371.
10	11/16	Location as a social determinant of health II: Public health & housing (film *Unnatural Causes: Place Matters)*	• Hives: Blackmar, "Accountability for Public Health: Regulating the Housing Market in Nineteenth-Century New York City, pp. 42-64. **Annotated bibliography due by midnight on November 15th**
11	11/23	The relationship of public health to health care	• IOM Report: Chap. 5, pp. 212-26 • Gostin, Lawrence O. and Madison Powers." What Does Social Justice Require for the Public's Health? Public Health Ethics and Policy Imperatives". Health Affairs. 25(4): 1055-1060. July/August 2006

12	11/30	Public health & corporate power	• Gerald Markowitz and David Rosner,"The Limits of Thresholds: Silica and the Politics of Science 1935-1990" American Journal of Public Health, February 1995, 85(2):253-262. • Read one article from Corporations and Health Watch: http://corporationsandhealth.org/
13	12/7	Public health & globalization	• McMichael AJ, Beaglehole R. "The changing global context of public health." The Lancet. 2000, 356: 495-499. • Leonard L. "Working 'off the record': polio eradication and state immunity in Chad." Critical Public Health. 2011, 21(3): 257-271.
14	12/14	Public health ethics, values and human rights	• Bayer, Ronald; Fairchild, Amy L. "The Genesis of Public Health Ethics", Bioethics, Nov 2004, 18(6):473-492; • Paul Farmer, "Pathologies of Power: Rethinking Health and Human Rights", American Journal of Public Health, 1999, 89(10):1486-96;
15			**Synthesis paper due by midnight on December 18th**

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Lehman College
PHE 702: Environmental Health
3 Credits
Fall 2015

Time and location	Gillet Hall, Room 311, Tuesdays, 6:00-8:40
Instructor	Andrew Maroko, PhD. Gillet Hall, 323 Andrew.Maroko@lehman.cuny.edu [best way to contact me] 718-960-1830
Office hours	Mondays 3:00p-5:00p and by appointment. Please email first.
Course website	This course uses Blackboard. https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Impact of human activities on environmental quality and human health; effect of environment on health and disease; examination of ecological principles, environmental health assessment, health policy/law and environmental justice; human population dynamics; and types and sources of pollutants and approaches to prevention and control. Environmental disease monitoring and health risk assessment are examined using GISc.
Course prerequisites	N/A
Course format	Lecture
Required reading and resources	"Essentials of Environmental Health,2nd ed." by Robert Friis, 2010, Jones and Bartlett Publishers, Sudbury, MA Additional Articles TBA
Suggested reading and resources	"Geographies of Health: An Introduction (2nd ed.)," by Anthony Gatrell and Susan Elliot, 2009, Wiley-Blackwell. "Environmental Health: From Global to Local," by Howard Frumkin, (Editor), 2005, Jossey-Bass. "GIS for the Urban Environment," by Juliana Maantay and John Ziegler, 2006, ESRI Press, Redlands, Ca "GIS and Public Health," by Ellen Cromley and Sara McLafferty, 2002, Guilford Press, New York, NY "Cartographies of Disease: Maps, Mapping, and Medicine," by Tom Koch, 2005, ESRI Press, Redlands, CA "The Ghost Map: The Story of London's Most Terrifying Epidemic—and How it Changed Science, Cities, and the Modern World" by Steven Johnson, 2006, Riverhead Books, Penguin Group(USA) Inc, New York, NY.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Describe approaches for identifying and assessing the human and ecological impacts of workplace, community, and residential environmental hazards	• Midterm and Final Exam • Assignments 2-6 • Quizzes 1-9
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Explain the importance of working collaboratively with diverse communities, sectors, and constituencies in the development, implementation, and evaluation of workplace and environmental health programs and policies. • Describe the elements, appropriate use and limitations of key risk assessment, risk management and risk communication strategies	• Midterm Exam • Quizzes 2, 3, 5, 6 • Assignments 4, 5
Apply basic statistical and informatics techniques	• Use informatics techniques to retrieve, analyze and summarize environmental health data • Use spreadsheet applications to collect, conduct descriptive analyses, and graphically represent data	• Midterm and Final Exam • Assignments 1-3, 6 • Quizzes 1, 2
Communicate public health information through oral, written, digital and visual presentation	•	• Assignments 2-6
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Understand the basic mechanisms of toxicity and pathobiology • Achieve a basic understanding of how genetic, physiologic, psychosocial factors influence susceptibility to adverse health outcomes following exposure to workplace, community,	• Midterm and Final Exam • Assignments 2-6 • Quizzes 1-9

	and residential environmental hazards • Identify the major types and sources of environmental agents that can impact health in workplace, urban community and residential settings. • Describe the pathways by which major environmental agents cause human exposure in workplace, urban community and residential settings. • Explain the reasons, sources, and impacts of inequitable distribution of environmental hazards	
Design and evaluate interventions to prevent or control public health problems	• Describe basic concepts and strategies for controlling environmental hazards in workplace, community, and residential settings and the advantages and limitations of	• Midterm and Final Exam • Quizzes 3-9
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Identify the major provisions, accomplishments and limitations of key environmental and occupational regulatory programs, guidelines, and authorities at the federal, state and local level.	• Midterm and Final Exam • Quizzes 3, 9

Course Assessments

Your understanding of the course material will be evaluated through assignments (6), quizzes (9), midterm exam, final exam, and in-class discussion and participation.

Grading

Evaluation criteria: Grades will not be curved, there will be no extra credit and no grades will be dropped.

Class Participation: Class participation includes engagement in discussions and answering of questions during lecture. Lateness and absence will count against this grade. Class participation accounts for 10% of the final grade.

Assignments: Assignments (6) consist of in-class and take-home work. They include data compilation and analysis using Excel, internet-based research, and short essays. All sources must be properly cited using in-text citation (name and date in the body of the text) followed by a list of sources in a references section at the end (APA format is preferred).
Assignments will receive the following possible grade:

Full Credit (FC):	100%
Full Credit Minus (FC-):	90%
Partial Credit (PC):	75%
Partial Credit Minus (PC-):	50%
No Credit (NC):	0%

All assignments must be submitted via Blackboard (or emailed to me if Blackboard is down) before lecture on the due date to receive credit. Written assignments must be saved as a word document (.DOC or .DOCX). 1" margins, 1.5 spacing, and 10-12 point fonts are preferred. The documents must be saved as *LastName_FirstName_AssignmentName* (e.g. Smith_Joe_Assignment1.doc). If using email, the email containing the file should be titled using the course number (e.g. PHE 702) followed by the student name and assignment name (e.g. PHE702, Joe Smith, Assignment 1).
Assignments comprise 20% of the final grade.

Quizzes: Short online quizzes (9) will be delivered through and taken on blackboard. Most, but not all, weeks will have a quiz. They are to be taken independently although students are welcome to use their books, notes, or other resources. The quizzes must be completed before the next lecture. No late submissions will be accepted.

Midterm: The midterm will cover sessions 1-7, which includes all readings, assignments, quizzes, and lectures. It is composed of short answer and multiple choice questions and is worth 25% of the final grade.

Final: The final exam will cover sessions 9-14 (readings, assignments, quizzes, and lectures). It is composed of short answer and multiple choice questions and is worth 25% of the final grade.

The relative weight of each course component is as follows:

Assessment	Weight
Participation / Attendance	10%
Assignments	20%
Quizzes	20%
Midterm Exam	25%
Final Exam	25%
TOTAL	*100%*

The grading system for the course follows guidance in the Graduate Bulletin:

Letter Grade	Quality Points
A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
F, WU	0

Letter Grade	Numeric Grade
A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	70-76%
F	< 70%

Withdrawal

The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete

The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation
Lateness or absence will count against your class participation grade unless there is an emergency or it is cleared with the professor in a timely fashion before class. If you miss a session, it is your responsibility to check with your classmates for notes and other course materials.

Late/incomplete submission of assignments
Late assignments/quizzes/exams will generally not be accepted unless it is cleared with the professor well before the due date. Under special circumstances, unexcused late assignments may be accepted (at the professor's discretion) but one full letter grade will be subtracted. If there is a medical reason for lateness, please supply documentation.

Make-ups, rewrites, and extra credit
There is no extra credit or re-writes in this course. Make-ups may be permitted if a late/incomplete assignment as described above is granted.

Expectations of students
Blackboard will be used to distribute and update assignments, readings, and other course materials. It is the student's responsibility to check it regularly.
The use of cell phones and other similar devices are not permitted during class.
Since some lectures may take place in a computer lab, the following additional rules apply:
- Monitors must be turned off during lectures
- No drinking or eating of any kind in the lab
- No printing of any materials without permission from the instructor or the lab manager
Students are expected to reply to emails (using their blackboard email address) promptly (e.g., within two business days) with proper academic writing style.

Expectations for the instructor
Students can expect the instructor to reply to emails promptly (within 2 business days). If you do not receive a reply within that time frame, please email again.
Assignments will be graded in as timely a fashion as possible, generally within 2 weeks of the due date. If you are granted a late assignment, this turn-around time does not apply.

Accessibility
Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, at 718-960-8441.

Academic integrity
The faculty and administration of Lehman College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Lehman College procedure for implementing the policy can be found in the Graduate Bulletin.

The Academic Center for Excellence (ACE) and the Science Learning Center (SLC):
Lehman College has two tutoring centers on campus. The ACE provides appointment-based and drop-in tutoring in the humanities, social sciences and writing, as well as general writing skills. The SLC provides drop-in tutoring for natural and computer science courses. To obtain more information about the ACE and SLC, please visit their website at http://www.lehman.edu/issp, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707.

Course Schedule

- Schedule, readings, assignments, and quizzes are subject to change
- Readings are to be done *before* the class in which they are discussed
- Assignments and quizzes are due *before* the *next* session
- See the Lehman academic calendar for important dates

Session	Date	Topic	Chapter Readings	Assignments/Quizzes
1	9/1	Introduction to the Course; Review of EH Principles and GISc in public health research.		A1: Excel Basics (due 9/8)
2	9/8	Environmental Epidemiology	Friis, Chapters 1 and 2; Gatrell Chapter 1*	A2: Population Q1: Lecture 2 (due 9/25)
3	**9/25**	Environmental Toxicology	Friis, Chapter 3; Koch, Chapters 1 and excerpts of 11 (handout)	A3: Odds Ratios Q2: Lecture 3 (due 9/29)
4	9/29	Environmental Policy and Regulation / Place Matters	Friis, Chapter 4; Gatrell Chapter 2*; Maantay article (Glasgow)*	Q3: Lecture 4 (due 10/6)
5	10/6	Zoonotic and Vector-Borne Diseases	Friis, Chapter 5; Gatrell Chapter 3*	Q4: Lecture5 (due 10/13)
6	10/13	Toxic Metals and Elements	Friis, Chapter 6	A4: Toxicology Q5: Lecture6 (due 10/20)
7	10/20	Pesticides and Other Organic Chemicals	Friis, Chapter 7	--
8	10/27	**Midterm Exam**	--	--
9	**11/3**	Ionizing and Nonioninzing Radiation (no in-class meeting - APHA)	Friis, Chapter 8	Q6: Lecture9 (due 11/10)
10	11/10	Water Quality	Friis, Chapter 9; Gatrell Chapter 8*	Q7: Lecture10 (due 11/17)
11	11/17	Air Quality I	Maantay article (Bronx)*; Friis, Chapter 10	A5: Global Warming
12	11/24	Air Quality II	--	A6: PM2.5 Collection Q8: Lecture12 (due 12/1)
13	12/1	Food Safety	Friis, Chapter 11	Q9: Lecture13 (due 12/8)
14	12/8	Solid and Liquid Wastes; Course Review for Exam	Friis, Chapter 12	--
15	12/22	**Final Exam**	--	--

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Lehman College
PHE 704: Environmental Health GISc Lab
1 Credit
Fall 2015

Time and location	Gillet Hall, Room 322 (GISc Lab) 8:50 – 9:30
Instructor	Andrew Maroko, PhD. Gillet Hall, 323 Andrew.Maroko@lehman.cuny.edu [best way to contact me] 718-960-1830
Office hours	Mondays 3:00p-5:00p and by appointment. Please email first.
Course website	This course uses Blackboard. https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Application of GISc to examine and analyze environmental health, population, and natural and built environmental data for planning and research.
Course Co-requisites	Co-requisite: PHE 702
Course format	Lecture and GISc Lab exercises
Required reading and resources	Lab instructions and readings provided by instructor via blackboard
Suggested reading and resources	"GIS for the Urban Environment," by Juliana Maantay and John Ziegler, 2006, ESRI Press, Redlands, Ca "GIS and Public Health," by Ellen Cromley and Sara McLafferty, 2002, Guilford Press, New York, NY "GIS Tutorial" by Wilpen Gorr and Kristen Kurland, 2008, ESRI Press, Redlands, CA "Cartographies of Disease: Maps, Mapping, and Medicine," by Tom Koch, 2005, ESRI Press, Redlands, CA

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments*:
Apply the public health core functions of assessment, policy development and assurance	• Use GISc as an approach for identifying and assessing (1) the human and ecological impacts of environmental hazards, (2) the geography of disease, and (3) the association between health and socio-demographics	Labs 2, 3, 7, 8
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Identify the elements, appropriate use and limitations of key risk assessment, risk management and risk communication strategies	Labs 7-9
Apply basic statistical and informatics techniques	• Use informatics techniques to retrieve, analyze and summarize health data • Use spreadsheet applications to collect and graphically represent data	Labs 1-9
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Explore and assess cartographically and geo-statistically the inequitable distribution of environmental hazards.	Labs 2-4

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments*:
Synthesize theories, methods, and practice of public health GISc	• Conduct simple spatial analyses and visualizations of health data	Labs 2-9
Interpret and analyze cartographic information	• Create and interpret simple cartographic products.	Labs 1-9
Analyze geographic health data in terms of spatial distribution and associations with other variables	• Utilize simple GI Science techniques such as buffering to examine health data	Labs 7-9
Understand, identify, estimate, and analyze environmental exposures and their impacts on urban public health	• Use simple buffers and co-location to identify potential environmental exposures and correlate them to specific health outcomes.	Labs 7-9
Effectively communicate public health information through oral, written and visual presentations	• Create simple maps to display environmental health data	Labs 1-9

Course Assessments

Your understanding of the course material will be evaluated through lab assignments and in-class discussion and participation.

Grading

Evaluation criteria
Labs will be evaluated based on a rubric (see blackboard). Grades will not be curved, there will be no extra credit and no grades will be dropped.

The relative weight of each course component is as follows:

Assessment	Weight
Participation/ Attendance	10%
Lab Assignments	90%
TOTAL	100%

The grading system for the course follows guidance in the Graduate Bulletin:

Letter Grade	Quality Points
A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
F, WU	0

Letter Grade	Numeric Grade
A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
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C+	77-79%
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Withdrawal
The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete
The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is

a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

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Course Policies

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Lateness or absence will count against your class participation grade unless there is an emergency or it is cleared with the professor in a timely fashion before class. If you miss a session, it is your responsibility to check with your classmates for notes and other course materials.

Late/incomplete submission of assignments
Late assignments/quizzes/exams will generally not be accepted unless it is cleared with the professor well before the due date. Under special circumstances, unexcused late assignments may be accepted (at the professor's discretion) but one full letter grade will be subtracted. If there is a medical reason for lateness, please supply documentation.

Make-ups, rewrites, and extra credit
There is no extra credit or re-writes in this course. Make-ups may be permitted if a late/incomplete assignment as described above is granted.

Expectations of students
Blackboard will be used to distribute and update assignments and other course materials. It is the student's responsibility to check it regularly.
The use of cell phones and other similar devices are not permitted during class.
Since the class takes place in the GISc computer lab, the following additional rules apply:
- Monitors must be turned off during lectures
- No drinking or eating of any kind in the lab
- No printing of any materials without permission from the instructor or the lab manager
Students are expected to reply to emails (using their blackboard email address) promptly (e.g., within two business days) with proper academic writing style.

Expectations for the instructor

Students can expect the instructor to reply to emails promptly (within 2 business days). If you do not receive a reply within that time frame, please email again.
Assignments will be graded in as timely a fashion as possible, generally within 2 weeks of the due date. If you are granted a late assignment, this turn-around time does not apply.

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Academic integrity

The faculty and administration of Lehman College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Lehman College procedure for implementing the policy can be found in the Graduate Bulletin.

Course Schedule

- Schedule, readings, assignments, and quizzes are subject to change
- All lab assignments are due BEFORE the next one begins (e.g. lab 1 is due before class on 9/8)
- See the Lehman academic calendar for important dates

Session	Date	Topic	Lab Assignment
1	9/1	Introduction to GISc	**Lab1:** GISc demo lab and handout (Maantay)
2	9/8	Thematic mapping	**Lab2:** Dot Density Maps with Health Data
3	**9/25**	Data classification	**Lab3:** Choropleth Maps with Health Data
4	9/29	Creating layouts	**Reading:** Maroko's map layout tips **Lab4:** Creating a Map Layout – Health and Poverty
5	10/6	Acquiring health data and census data from the internet	**Lab 5:** Downloading Health and Demographic Data
6	10/13	Spatialization of attribute data	**Lab 6:** Spatializing Tabular Data
7	10/20	…	Continue Lab 6
8	10/27	Proximity analysis	**Lab 7:** Simple Geoprocessing
9	**11/3**	… (no in-class meeting - APHA), the lab may remain open, please check website.	Continue Lab 7
10	11/10	Environmental justice analysis with GISc	**Lab8:** Layout of Environmental variables Influencing Blood Lead Levels
11	11/17	…	Continue Lab 8
12	11/24	Environmental health analysis with GISc	**Lab9:** Blood Lead Level Report
13	12/1	…	Continue Lab 9
14	12/8	…	**Lab 9 Due**
15	12/22	No Final	**--**

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Lehman College
PHE 705: Principles of GISc for Public Health
3 Credits
Fall 2015

Time and location	Gillet Hall, 311 (lecture) and 322 (lab); Monday, 6:00pm – 9:30pm
Instructor	Andrew Maroko, PhD., Gillet Hall, 323 Andrew.Maroko@lehman.cuny.edu [best way to contact me] 718-960-1830
Office hours	Mondays 3:00p-5:00p and by appointment. Please email first.
Course website	This course uses Blackboard. https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	The use of Geographic Information Systems relating to public health in the teaching of social, earth, and life sciences. Demographic studies and graphic presentation of demographic analysis. The use of modern mapping techniques in studies of the Earth Environment with emphasis on environmental health and environmental justice.
Course prerequisites	N/A
Course format	Lecture and lab
Required reading and resources	***GIS for the Urban Environment,*** by Juliana Maantay and John Ziegler, 2006, Environmental Systems Research Institute Press, Redlands, CA. ISBN-10: 1589480821; ISBN-13: 978-1589480827 This book is currently out of print but can be found used through online sources. A free PDF version will be provided to you (via blackboard) courtesy of the author. Additional readings will be provided via blackboard. A USB drive is highly recommended for this course.
Suggested reading and resources	BERRY, Joseph, ***Spatial Reasoning for Effective GIS***, 1995, John Wiley and Sons, NY, NY CAMPBELL, John, ***Map Use and Analysis,*** 2001, McGraw Hill, New York, NY DENT, Borden, ***Cartography: Thematic Map Design***, 1999, William C. Brown Publishers/McGraw-Hill, New York, NY DORLING, Daniel, and FAIRBAIRN, David, ***Mapping: Ways of Representing the World***, 1997, Addison Wesley Longman, Ltd., Harlow, UK ISAAKS, Edward, and SRIVATAVA, R. M., ***An Introduction to Applied Geostatistics***, 1989, Oxford University Press, Oxford, UK KAISER, Ward, and WOOD, Denis, ***Seeing Through Maps: The Power of Images to Shape Our World View***, 2001, ODT, Inc., Amherst, MA MONMONIER, Mark, ***How to Lie With Maps,*** 1991, Univesity of Chicago Press, Chiacago, IL PICKLES, John, ***Ground Truth: The Social Implications of Geographic Information Systems***, 1995, The Guilford Press, New York, NY WOOD, Denis, ***The Power of Maps***, 1992, The Guilford Press, New York, NY

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments*:
Apply the public health core functions of assessment, policy development and assurance	• Apply basic GIS functions to assess public health issues	• Labs 2-9 • Final Exam
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Identify GIS methods used for public health research	• Labs 2-4, 6-10 • Final Exam • Written Assignments 1-4
Apply basic statistical and informatics techniques	• Utilize simple statistics to assess public health data and create simple cartographic representations	• Labs 8-10 • Final Exam
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Use GIS to examine relationships between environmental exposure and health outcomes	• Labs 5-9 • Final Exam

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Synthesize theories, methods, empirical literature and practice of public health GISc	• Conduct simple spatial analyses of health data • Review peer-review articles concerning GISc	• Labs 2-9 • Written Assignments 1-4
Analyze geographic health data and cartographic information in terms of spatial distribution and associations with other variables	• Utilize geocoding, buffering, and other basic GISc functions to analyze health data • Create and interpret simple	• Labs 1-10 • Final Exam

	cartographic products	
Identify, estimate, and analyze environmental exposure and their impacts on urban public health and social inequality	• Utilize distance-based techniques to identify environmental exposures in an urban environment • Construct geographic buffers and other basic GIS techniques to identify environmental justice issues • Compute differences in exposures based on socio-demographics	• Labs 5-10 • Final Exam
Communicate public health geographic information through oral, written and visual presentations	• Create simple cartographic products to present public health GIS information • Create map layouts and other cartographic products suitable for publication	• Labs 1-10 • Oral Presentations

Course Assessments

Your understanding of the course material will be evaluated through class discussions, written assignments, oral presentations, lab assignments, and a final exam.

Grading

Evaluation criteria: Grades will not be curved, there will be no extra credit and no grades will be dropped. Rubrics can be seen on Blackboard.

Class Participation: Class participation includes engagement in discussions and answering of questions during lecture. Lateness and absence will count against this grade. Class participation accounts for 10% of the final grade.

GIS Lab Assignments: Labs will be done both during scheduled lab time (usually the second 2 hours of the class), in the lab during non-class hours (provided the lab is available – a schedule will be provided), or at home (provided the student has the ability to install the provided software). Students who do not work in the lab during the scheduled class time will not get support from the instructor or the lab tutor. Labs account for 40% of the final grade. A USB drive is highly recommended.

Written Assignments: There are four written assignments, two which are from the Maantay book (written assignments 1 and 2 in the syllabus) and two which are summaries of journal articles (article summary 1 and 2). All sources must be properly cited using in-text citation (name and date in the body of the text) followed by a list of sources in a “references” section at the end (APA format is preferred). Written assignments account for 20% of the final grade

Turning in Assignments: All assignments (written and lab) must be submitted electronically before lecture on the due date to receive credit. Written assignments must be saved as a word document (.DOC or .DOCX) and be saved as *LastName_FirstName_AssignmentName* (e.g. Smith_Joe_Assignment1.docx). I prefer 1” margins, 1.5 spacing, 12-point fonts,. Lab assignments must either be saved as a word document, as a PDF, or as a JPG (unless another format is specified). Assignments should be submitted through Blackboard. If Blackboard is down, email the file(s) titling the message with the class (e.g., PHE 705) followed by the student name and assignment name (e.g. PHE 705, Joe Smith, WA1).

Presentations: Graduate students are expected to make a presentation of one of their written assignments (WA1 or WA2, not the article summaries). Although using PowerPoint is not required, it is encouraged if appropriate. Presentations must be short, concise, and complete. They account for 5% of the final grade.

Final: The in-class final exam will cover the entire course (readings, assignments, labs, and lectures). It has two main sections. The written part is composed of multiple choice, short answer, and essay questions and the GIS practical part is composed of a "real world" GIS problem for you to solve (essentially a lab without instructions). The final is worth 35% of the final grade.

The relative weight of each course component is as follows:

Assessment	Weight
Class Participation and Attendance	10%
GISc Lab Assignments	40%
Written Assignments	20%
Oral Presentations	5%
Final Exam	25%
	100%

The grading system for the course follows guidance in the Graduate Bulletin:

Letter Grade	Quality Points
A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
F, WU	0

Letter Grade	Numeric Grade
A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	70-76%
F	< 70%

Withdrawal

The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete

The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to

complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation
Lateness or absence will count against your class participation grade unless there is an emergency or it is cleared with the professor in a timely fashion before class. If you miss a session, it is your responsibility to check with your classmates for notes and other course materials.

Late/incomplete submission of assignments
Late assignments will generally not be accepted unless it is cleared with the professor well before the due date. Under special circumstances, unexcused late assignments may be accepted (at the professor's discretion) but one full letter grade will be subtracted. If there is a medical reason for lateness, please supply documentation.

Make-ups, rewrites, and extra credit
There is no extra credit or re-writes in this course. Make-ups may be permitted if a late/incomplete assignment as described above is granted.

Expectations of students
Blackboard will be used to distribute and update assignments, readings, and other course materials. It is the student's responsibility to check it regularly.
The use of cell phones and other similar devices are not permitted during class.
Since some lectures may take place in a computer lab, the following additional rules apply:
- Monitors must be turned off during lectures
- No drinking or eating of any kind in the lab
- No printing of any materials without permission from the instructor or the lab manager
Students are expected to reply to emails (using their blackboard email address) promptly (e.g., within two business days) with proper academic writing style.

Expectations for the instructor
Students can expect the instructor to reply to emails promptly (within 2 business days). If you do not receive a reply within that time frame, please email again.
Assignments will be graded in as timely a fashion as possible, generally within 2 weeks of the due date. If you are granted a late assignment, this turn-around time does not apply.

Accessibility
Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, at 718-960-8441.

Academic integrity
The faculty and administration of Lehman College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Lehman College procedure for implementing the policy can be found in the Graduate Bulletin.

The Academic Center for Excellence (ACE) and the Science Learning Center (SLC):
Lehman College has two tutoring centers on campus. The ACE provides appointment-based and drop-in tutoring in the humanities, social sciences and writing, as well as general writing skills. The SLC provides drop-in tutoring for natural and computer science courses. To obtain more information about the ACE and SLC, please visit their website at http://www.lehman.edu/issp, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707.

Course Schedule

Readings are to be done before the class in which they are listed (e.g., chapters 1&2 in Maantay must be read prior to class 2). See the Lehman academic calendar for important dates.

Class	Date	Lecture Topic	Reading	Lab Assignment	Written Assignment
1	8/31	Introduction to the Principles of GIS	--	Lab01: Exploring Basic GIS Functionality (nothing to hand in)	--
2	**9/10**	Modeling Spatial Data and Basic Mapping Concepts	Maantay, CH 1 and 2	Lab02: Thematic Mapping - Creating a Dot Density Map (screen capture due class 3)	WA1: Report on GIS Projects on the Internet (same as written exercise 1 in Maantay, pages 20-22; Due Class 4)
3	**9/21**	Thematic Mapping	Maantay, CH 3;	Lab03: Thematic Mapping – Creating a Choropleth Map (screen capture, due class 4); **Lab02 due**	--
4	9/28	Data Classification Methods and Data Exploration	Maantay, CH 4	Lab04: Integrating Graphs and Maps, and Creating a Map Layout (due class 5); **Lab03 due**	**WA1 due**
5	10/5	Data Visualization and Map Design	Maantay, CH 5	Continue Lab04	--
6	**10/19**	Data Sources **Presentation of WA1**	Maantay, CH 6;	Lab05: Attribute Database from an Internet Source (nothing to turn in) **Lab04 due**	WA2: Designing a GIS Project to Solve Real-World Problems in the News (Same as written exercise 9 in Maantay; Due Class 13)
7	10/26	Mapping Databases; & Guest Lecture	Maantay, CH 7; journal article*	Lab06: Geocoding and Labeling (due class 9)	Article Summary 1 (due class 9)
8	**11/2**	(no in-class meeting – APHA)	Maantay, CH 8	Continue Lab06	
9	11/9	Attribute Data Management; Class critique of Lab 5; Guest Lecture (TBD)	journal article*	Lab07: Relational Databases (due class 10); **Lab06 due**	**Article Summary 1 due**; Article Summary 2 (due class 11)
10	11/16	Methods of Spatial Data Analysis (1)	Maantay, CH 9	Lab08: Buffers and Proximity Analysis (due class 11); **Lab07 due**	--
11	11/23	GIS Project Development and Institutional Issues / Spatial Data Analysis (2)	Maantay, CH 10	Lab09: Geoprocessing Operations and Joining tables (due class 13); **Lab08 due**	**Article Summary 2 due**
12	11/30	Ethical Issues in GIS	Maantay, CH 11	Continue Lab09; "practice" GIS practical	--
13	12/7	**Presentation of WA2;** Course Review	--	Lab10: Areal Weighting and Spatial Selection Comparison **Lab09 due**	**WA2 due**
14	12/14	Course Review / **GIS Practical Final**	--	**Lab10 due**	--
15	12/21	**Final Exam**	--	--	--

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS
Lehman College
PHE 710: Applications of Research Methods in Public Health

3 Credits
Fall 2015

Time and location	Monday 6 to 8:40 PM Carman 125
Instructor	Professor Luisa N. Borrell, D.D.S, Ph.D. Email: Luisa.Borrell@lehman.cuny.edu (best way for contact) Phone: 718- 960-8549 Office: Gillet 336
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Principles of statistical and other research methods applied to design of public health studies; analysis, interpretation, and reporting of epidemiological data to public health professionals and lay audiences.
Course prerequisites	PHE 600 and PHE 606
Course format	Lecture and lab
Required reading and resources	LG Portney and MP Watkins. *Foundations of Clinical Research, Applications to Practice*. 3rd Edition. F.A. Davis Company 2015 or Prentice Hall, 2008. R Cody. *SAS statistics by example. SAS* Institute Inc. 2011.
Suggested reading and resources	**General:** Moyses Szklo and F. Javier Nieto. *Epidemiology beyond the Basics*. 3rd Edition. Jones and Bartlett, 2012. ***From Association to Causation:*** *Bradford Hill 1965's Article: The Environment and Disease-Association or Causation?* http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1898525&blobtype=pdf **Linear Regression:** *Influence of birth weight on white blood cell count in biracial (black-white) children, adolescents and young adults: The Bogalusa Heart Study. Wei Chen et al.* American Journal of Epidemiology *2009; 159: 214-218.* *http://aje.oxfordjournals.org/content/169/2/214.full.pdf+html* **Logistic Regression**: Ovarian cancer risk factors in African-American and white women. Patricia G. Moorman et al. *American Journal of Epidemiology* 2009; 170:598-606. http://aje.oxfordjournals.org/content/170/5/598.full.pdf+html

Last Updated July 23, 2015

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments*:
Communicate public health information through oral, written, digital and visual presentation	• Identify and combine epidemiological concepts and appropriate statistical methods to answer research questions and test hypotheses	• Exams, lab assignments (see below) and class participation
Collect, analyze and interpret public health data	• Present and interpret epidemiologic data for both descriptive and analytical epidemiological studies	• Exams, lab assignments (see below) and class participation
Interpret and analyze public health literature and apply evidence-based research	• Summarize and display data in both tabular and narrative form, similar to the Results section of a public health manuscript	• Exams, lab assignments (see below) and class participation

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments*:
Analyze critical health inequalities confronting urban populations by social and economic determinants such as race, ethnicity, income and neighborhood	• Formulate epidemiological problems as research questions and testable hypotheses	• Exams, lab assignments (see below) and class participation
Synthesize theories, methods and practice of public health to address income inequities within communities	• Critique and understand the tradeoff made in the methods used in published epidemiologic studies • Illustrate the use of SAS to perform basic and inferential statistics	• Exams, lab assignments (see below) and class participation

Course Assessments
Each class session will consist of a lecture and a lab practicum. Each lecture will include an explanation of the research questions, the appropriate tests to be used for each hypothesis, and a discussion of SAS outputs. During the laboratory session, students will be expected to answer research questions and test hypotheses using a public dataset. There will be four labs to assess the knowledge obtained through class lecture, lab and assigned readings. Finally, there will be two class sessions for discussion of journal articles relevant to the epidemiologic study designs covered during the Epidemiology Core course.

Grading
Your understanding of the course material will be evaluated by the following:

Assignments and Grading:

Attendance	10%
Participation in class discussion based on readings	10%
Lab assignments (4 @ 7.5 points each)	30%
Midterm Exam (20 points)	20%
Final Exam (30 points)	30%
Total	100%

The grading system for the course follows guidance in the Graduate Bulletin:

Letter Grade	Points	Quality Points
A	93-100	4.0
A-	90-92	3.7
B+	87-89	3.3
B	83-86	3.0
B-	80-82	2.7
C+	77-79	2.3
C	73-76	2.0
C-	70-72	1.7
F, WU	<=69	0

Withdrawal
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Grade of incomplete
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Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation
Attendance and class participation are part of your grade. Students are expected to attend classes regularly, and instructors are required to record attendance for grading and counseling purposes. Individual instructors, as well as departments or degree programs, may establish specific attendance requirements. Instructors have the right to weigh attendance and class participation in determining grades. It is the student's responsibility to ascertain the effect attendance may have on the grade in a course. Students receiving financial aid must be certified as attending classes regularly for continuing eligibility.

Late submission of assignments
Late submission assignment would be penalized with a 1 for each day late. However, once the answer key is posted, the assignment would be worth a 0.

Make-ups, rewrites, and extra credit
There is not make up or rewrites for the lab assignments as the answer key are posted the day after the due date by 5PM.

Expectations of students
Students are expected to come to class on time. In addtion, they would not be allowed to use cell phone or do e-mails during class.

Expectations for the instructor
The instructor would be available face to face or by e-mail to answer any question or clarify any issues students may have on any aspects of the course.

Accessibility

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Course Schedule – Update 08/10/15
**Please note that the schedule is subject to change throughout the semester.

Session	Date	Topic	Readings and Assignments
1	08/31	**I. Introduction, Course Guidelines & Needs Assessment** Review of basic epidemiology concepts and statistical methods Key Themes: Where we were and where are we going from here? Cross-sectional, case-control and longitudinal studies, rate, ratio, proportion, prevalence, incidence, odds ratio, risk ratio, rate ratio, attributable risk, attributable risk percent, sample, population, mean, median, mode, variance, standard deviation, range, IQR and confidence intervals. Lab: Data management: reading in raw data; importing *.xls and *.dbf files; creating permanent datasets; recoding variables, and creating codebooks	Gross Portney & Watkins: Chapte 28 (659-671), 13 (277-290) and 17 (385-400) Cody Chapter 1
2	09/07	**Labor Day**	No class
3	09/10	**II. From the Research Question to the Hypothesis:** Introduction to readily available national datasets, Sampling Methods & Descriptive Statistics Key Themes: Samples and Populations: Similarities and Differences Advantages and disadvantages of different sampling methods Describing and summarizing data for a population/sample Lab: Data management: cleaning the variables, creating new variables; DATA steps and PROC steps to obtain descriptive statistics for continuous and categorical variables	NHANES design and methodology (Check the bookmark for Sample Design and Analysis Guidelines-Specifically check pages 20-22 in the document). The website for the manual is: http://www.cdc.gov/nchs/data/series/sr_01/sr01_032.pdf Gross Portney & Watkins: Chapter 8 (143-157) Cody Chapters 2 (19-33), 3 (pages 41-48, 52-55) and 5 (Pages 74-78)

4	09/14	**Rosh Hashanah**	No class
5	09/21	**III. Measurement Issues and Hypothesis Testing** From the research question to the variables: Can you answer the question with data available? Learning how research questions are answered through hypotheses testing. Key Theme: Research question versus hypothesis: their relationship and differences. Describing variables: How do you compare groups? Lab: Group comparisons: Estimation, t-test, ANOVA and chi-square statistic **Assignment 1 Due**	Gross Portney & Watkins: Chapters 7 (121-136), 18 (405-424; 426-429), 19 (433-445) and 20 (451-458) Journal Article: Wei Chen et al. (2009) -- Introduction Cody Chapters 5, 6, 7 (pages 91-102) and 10 (163-171, 175, 178-182)
6	09/28	**IV. Bringing it all together: Descriptive and inferential statistics for continuous and categorical variables**	Readings assigned on 9/14 and 9/21
7	10/05	**Review** **Assignment 2 Due**	
8	10/12	**Columbus Day**	No class
9	10/19	**Midterm**	
10	10/26	**V. The Central Epidemiologic Constructs: Exposures and Outcomes** When the outcome is continuous Key Themes: Exposures, outcomes and covariates: How were they collected? How many levels do they have? What is the nature of the data? Why do we care about the above? Continuous Variables: Looking at Association. Lab: Correlation and simple linear regression	Gross Portney & Watkins: Chapters 4, 23 (523-537) and 24 (539-547; 551-554) Journal Article: Wei Chen et al. (2009) —Materials and Methods Cody Chapters 8 (111-125) and 9 (135-137, 153-155)
10	11/02	**VI. When the Box Does Not Fit: Dealing with Continuous Constructs and How Do We Get Causes from Correlations? Part I** Key Themes: How do you describe an association	Bradford Hill 1965's Article: The Environment and Disease-Association or Causation? Gross Portney & Watkins: Chapters 24 (547-551) and 29

		between X and Y when they are continuous in the presence of other covariates? From association to causation: the caveats Conditions necessary to rule causation over association. Lab: Regression diagnostics and multiple linear regression	(687-691, 694-696) Journal Article: Wei Chen et al. (2009)—Materials and Methods Recommended Reading: Szklo & Nieto: Chapter 5 (153-177) Cody Chapters 8 (111-125) and 9 (135-137, 153-155)
11	11/09	**VII. When the Box Does Not Fit: Dealing with Continuous Constructs and How Do We Get Causes from Correlations? Part II** Key Themes: Is there a true association between X and Y after controlling for a third variables? Lab: Multiple linear regression & confounder	Gross Portney & Watkins: Chapters 24 (547-551) and 29 (687-691) Journal Article: Wei Chen et al. (2009)—Materials and Methods Recommend reading: Szklo & Nieto: Chapter 5 (153-177) Cody Chapters 8 (111-125, 129-132) and 9 (135-137, 153-155)
12	11/16	**Journal Club – Linear regression** **Room TBA** **Assignment 3 Due**	Influence of birth weight on white blood cell count in biracial (black-white) children, adolescents and young adults: The Bogalusa Heart Study. Wei Chen et al. American Journal of Epidemiology 2009; 159: 214-218.
13	11/23	**VIII. Analysis of Frequencies – Measures of Association I** Key Themes: The yes/no or 0/1 values of a variable or perhaps the 1/2/3 or more values of a variable The advantages and disadvantages Association and causation revisited What other methods can we use to evaluate association between categorical variables? Lab: Chi-square of independence, CMH **,** Fisher, OR, PR, RR and CI, Trend test, McNemar's test, test of Homogeneity, Breslow Day test and introduction to Logistic regression	Gross Portney & Watkins: Chapters 25 (569-571 up to Goodness of Fit; 575-581) and 29 (694-702) Journal Article: Patricia G. Moorman et al. (2009) – Introduction & Materials and Methods Cody Chapters 10 (163-171, 175 mid page topic, 178-182) and 11 (183-191, 193-204)

14	11/30	**XI. Analysis of Frequencies – When dealing with more than 2 covariates II** Key Themes: How do we evaluate association whether 1) there is a true association or not and 2) whether the association differs by a third variable? What do we do when there are more than two covariates (or three or four variables)? Lab: Multiple logistic regression with continuous and categorical variables	Recommended Reading: Szklo & Nieto : Chapters 6 (185-196 up to section 6.4, 207-211 up to section 6.8) and 7 (242-266 up to section 7.4.4) Cody Chapter 11 (183-191, 193-204)
15	12/07	**Journal Club – Logistic regression** **Room TBA** **Assignment 4 Due**	Ovarian cancer risk factors in African-American and white women. Patricia G. Moorman et al. American Journal of Epidemiology 2009; 170: 598-606.
16	12/14	**Review** Where we started and where we are now	
17	12/21	**Final Exam**	

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Lehman College
PHE 715: Planning and Evaluation of Community-Based Public Health Programs
3 Credits
Fall 2015

Time and location	Thursdays, 6-8:40pm Lehman College, location TBA
Instructor	Emma K. Tsui, PhD, MPH emma.tsui@lehman.cuny.edu (preferred mode of communication) 347-577-4038 Gillet Hall, Room 422D
Office hours	Mondays 4:30-5:30pm and Thursdays 3:30-5:30pm (walk-in) and other times by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available. Lehman's Academic Center for Excellence (ACE) provides appointment-based and drop-in tutoring and general writing and academic skills workshops. To obtain more information about the ACE, please visit http://www.lehman.edu/issp or call the ACE at 718-960-8175.
Course description	Fundamental approaches and methods for planning and evaluating public health programs. Application of theory and the empirical literature as a means of developing skills in evidence-based public health practice.
Course prerequisites	N/A
Course format	In-person lecture and discussion-based sessions
Required reading and resources	Issel LM. Health Program Planning and Evaluation: A Practical, Systematic Approach for Community Health. Boston: Jones and Bartlett Publishers, 3rd edition, 2014. Price: $81.83, Amazon Available on reserve at the Leonard Lief Library Other articles as assigned under "Schedule".
Suggested reading and resources	N/A

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments*:
Communicate public health information through oral, written, digital and visual presentation	• Prepare and deliver a professional presentation describing a program and evaluation plan • Prepare elements of a written program and evaluation plan	Assignments 1-5
Interpret and analyze public health literature and apply evidence-based research	• Identify evidence-based or promising interventions for addressing a particular public health issue in a target population	Assignments 1 and 5

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify aspects of public health ethics and values of social justice that affect public health practice and decision-making	• Articulate potential ethical issues in designing and conducting program planning and evaluation activities • Demonstrate an understanding of the power dynamics involved in community collaboration and participatory research, the importance of these dynamics, and ways of addressing them	Class participation, midterm

Assess the health needs and issues confronting communities	• Apply a community-based participatory framework to addressing health issues confronting communities	Class participation, midterm
Synthesize theories, methods and practice of public health to address income inequities within communities	• Understand the role of theory and appropriately apply theories and models in program planning and evaluation • Develop a plan for an evidence-based public health program • Write program objectives that are clear, specific and measurable • Develop program theories and logic models for public health programs • Design data collection techniques for program evaluation	Assignments 1-5, class participation, midterm

Course Assessments
Your understanding of the course material will be evaluated through participation in class discussions, your engagement and performance during in-class assignments and activities, a midterm exam, two written assignments that serve as elements of the final evaluation plan, your response to critique and comments on written assignments, and your final paper and presentation.

There will be one midterm exam in this course, which will include multiple choice, true/false, and short answer questions, among other question types. For the remaining assignments, you will be considering, writing, and/or speaking about a single public health program of your choice. Before choosing a program, please make sure that you can complete all of these assignments using this program. You should be able to relatively easily identify: 1) the target health condition(s) or behavior, 2) the target population, 3) the setting of the intervention or program, and 4) the program activities or intervention strategies. In my experience, the best projects are often the ones that are simplest (involving no more than one or two types of intervention activities) and that offer the most detail in terms of location and program activities.

A note on attendance and participation: Because these assignments build on one another, fastidious attendance and engaged participation in the course are of utmost importance. These also comprise a substantial portion of your grade—10%—so please come to each class prepared to participate fully.

Assignment 1: Program Description & Rationale
Length: 4-6 pages doubled-spaced
For this assignment, you will briefly describe your program (2-4 paragraphs) including 1) the target health condition(s) or behavior, 2) the target population, 3) the setting of the intervention or program, and 4) the program activities or intervention strategies. You will then provide a compelling rationale for your program addressing the question of what evidence there is that this program is likely to be effective. Please use at least 5-10 references to peer-reviewed or other appropriate literature to articulate your rationale.

Assignment 2: Program Objectives (in class)
For this assignment, you will write 3-5 specific, measurable, achievable, realistic, and time-bound program objectives for your program in class. You will get feedback from class members and from me on these objectives in class, and you will then revise and finalize them for your final paper, due at the end of the course.

Assignment 3: Program Evaluation Survey
In this assignment, you will design a short survey that will help to evaluate your program objectives. You should begin with a short description of how you will sample survey respondents, how the survey will be administered (in person, over the phone, via email/Internet), and why. You should collect relevant demographic information and include 5-10 well-designed questions related to your objectives.

Assignment 4: Program Presentation
In the final sessions of the course, each student will give a 10-minute presentation on their program. A grading rubric providing guidance on content and style will be distributed in advance of the presentations.

Assignment 5: Final Program Elements Paper
Please include the following:

1) Description of your program and rationale (revised from Assignment 1)
2) Program objectives (revised from Assignment 2)
3) Program evaluation survey (revised from Assignment 3)
4) Discussion of key stakeholders and how you will communicate your evaluation findings
5) You may include a logic model for your program for extra credit.

Grading
Evaluation criteria
Grading rubrics will be provided via the course website for course assignments.

The relative weight of each course component is as follows:

Assessment	Weight
Class attendance & participation	10%
Program description & rationale	10%
Midterm exam	30%
Program evaluation survey	10%
Final presentation	10%
Final paper	30%
	100%

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The grading system for the course follows guidance given by the Lehman College Department of Health Sciences:

Letter Grade	Points
A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
F	< 70%

Withdrawal
The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete
The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies
Attendance and class participation
All members of the class are expected to actively participate in class lectures, activities, and discussions, and to complete assigned reading **and other assigned activities** prior to class. Attendance means more than just showing up; it means doing the reading and, more importantly, actively engaging with the ideas and issues brought up in the reading and in class. Your comments, questions and opinions are essential ingredients for making this course a challenging and rewarding experience for your classmates as well as for yourself, and it is expected that you come prepared to make this contribution. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible. Points may be deducted for absences, tardiness, or leaving class early.

Late/incomplete submission of assignments
I expect that all assignments that are not to be completed in class will be submitted to me via email or Blackboard by midnight on the due date (usually the night before a

class session). Assignments submitted after the due date will have half a letter grade deducted for each day that the assignment is late, except in cases of significant medical issues or other serious situations.

Make-ups, rewrites, and extra credit

Make-up assignments will not be allowed in this course, nor will rewrites. Extra credit assignments may be made available to students as opportunities during the semester present themselves.

Expectations of students

I expect the classroom to serve as a space of respect and collaborative learning and that the course assignments will help you to develop specific skills. To that end, I expect that:

- you will arrive on time and stay for the entire class
- you will not use cell phones during class, except during breaks
- you will visit our Blackboard site frequently, as that will be our primary way of communicating with one another outside of class. Class announcements and supplemental materials will be posted there frequently. Course announcements will also be sent out using the Lehman e-mail system. If you have any questions about your Lehman email address or your password, or if you have any problems accessing the site, please call the computer helpdesk at 718-960-1111.
- your writing for assignments will be of high quality, presented in a readable and consistent manner: double-spaced, typewritten, with one-inch margins all around, and **proofread**.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during in-class discussions
- Respond to student email within 24 hours Monday through Friday.
- Grading and feedback on assignments within 2 weeks of the due date.

Accessibility

Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, at 718-960-8441.

Academic integrity

The faculty and administration of Lehman College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Lehman College procedure for implementing the policy can be found in the Graduate Bulletin.

Course Schedule
Please note that the schedule and assignments listed below are subject to change. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. All readings that are not part of the required text will be available via Blackboard. For important dates (e.g., course drop and withdrawal), please refer to Lehman's graduate academic calendar: http://www.lehman.edu/registrar/calendars.php.

	Date	Topic	Readings & Assignments
1	August 27th	Introduction to the Course	Readings: Gawande, 2013; Interview with Michael Quinn Patton
2	September 3rd	Foundations & Design of a Planning Process	Readings: Issel, Ch. 2-3; Ostrovsky & Katz, 2011
	September 10th	No class (classes follow a Monday schedule)	
3	September 17th	Developing & Using a Program Theory	Readings: Issel, Ch. 6; Bartholomew et al., 2006; Wall et al., 2009
4	September 24th	Intervention Design In-Class Assignment: **Writing Program Objectives**	Readings: Issel, Ch. 7 (only p.215-226 required) and Ch. 8 **Program description & rationale due on September 23rd at midnight**
5	October 1st	Process Evaluation Guest speaker: Sara Flowers on evidence-informed interventions	Readings: Issel, Ch. 10
6	October 8th	Effect Evaluation	Readings: Issel, Ch. 12 and p. 393-406 of Ch. 13 plus assigned research design section
7	October 15th	**Midterm Exam**	

8	October 22nd	Designing Surveys for Program Evaluation	Readings: Issel, Ch. 14
9	October 29th	Qualitative Research Methods for Planning & Evaluation	Readings: Issel, Ch. 16; Reisinger, 2004; Tinmouth et al., 2011
10	November 5th	Logic Models In-Class Activity: Developing a Logic Model	Readings: Kellogg, Chs. 1-2; Children's Aid Society Go!Healthy Program Evaluation, p.1-4 **Program evaluation survey due on November 4th at midnight**
11	November 12th	Program Budgeting Guest speaker: Kimberly Seals Allers on community-partnered intervention development	Readings: Issel, Ch. 9, up to p. 298
12	November 19th	Ethics, Sustainability, and Communicating Evaluation Findings	Readings: Issel, Ch. 17; Scheirer, 2005; Torres et al., 2004
	November 26th	No class (Thanksgiving)	
13	December 3rd	**Final Presentations**	
14	December 10th	**Final Presentations**	
15			**Final paper due on December 16th at midnight**

CUNY SCHOOL OF PUBLIC HEALTH

Course Syllabus
Lehman College
PHE 724/PH72600/HNSC 7310/PUBH 87100: Maternal and Child Health: A lifecourse perspective
Fall 2015

Course description	Examination of the social determinants of and inequities in maternal and child health from a life course perspective
Course format	Hybrid: class will meet in-person six times during semester
Course meets	Graduate Center, Room 3209, Tuesday 6:30-8:30
Instructor	Mary Huynh, PhD
Email	mary.huynh@lehman.cuny.edu [Email is the best way to reach me]
Office hours	By appointment
Required books	None
Recommended books	None
Reserve material	None

Other required materials All required readings will be posted in Blackboard.

Assessment
Your understanding of the course material will be evaluated through reaction papers, discussion board participation, a final project, and in-class participation/attendance.

Description of course grade components:

In-class Participation/Attendance: This class is being taught as a seminar and workshop. Therefore students are expected to attend class in order to participate in discussions and provide comments and suggestions to their fellow students on their work. Students are expected to reflect.

Discussion Board Participation: On days, when the format of the class is online, students are expected to participate via the discussion board to address questions and reflect on the readings.

Written Assignments: Students will write 3 one-page reaction/discussion papers, along with a few questions for clarification and discussion. Your reaction paper should synthesize and critically evaluate key theoretical, methodological and/or substantive contributions of the readings. This may consist of identifying questions that the readings provoke; critiquing problematic assumptions, logic, and measurement; discussing theoretical and empirical advances; and considering ideas for future directions. Late response papers will not be evaluated. The reflections are due by email to mary.huynh@lehman.cuny.edu by 12 noon the day of class. When referring to a specific article in the reflection, please use the author-date style. Format: single-spaced, typed, 12-point Times Roman font with 1-inch margins.

The end product of the class project will be a brief proposal/grant application. Late assignments will be penalized for each day they are late (including weekends and holidays).

Grading

20%	Online Discussion Board Participation
30%	Reaction Papers
40%	Brief Proposal
10%	In-class Participation/Attendance
100%	

The following grading scheme will be applied:

Letter Grade	**Points**	**Quality Points**
A	93-100	4.0
A-	90-92	3.7
B+	87-89	3.3
B	83-86	3.0
B-	80-82	2.7
C+	77-79	2.3
C	73-76	2.0
C-	70-72	1.7
F, WU	<69	0

Course Policies

Attendance and class participation
Students are expected to attend classes when indicated on the syllabus, and instructors are required to record attendance for grading and counseling purposes. Individual instructors, as well as departments or degree programs, may establish specific attendance requirements. Instructors have the right to weigh attendance and class participation in determining grades. It is the student's responsibility to ascertain the effect attendance may have on their grade in a course. Students receiving financial aid must be certified as attending classes regularly for continuing eligibility.

Lateness and absences
Students are expected to be in class on time. Students should not be absent from class unless an emergency should occur. Documentation of medical emergencies will be required.

Late submission of assignments
Assignments submitted late will be penalized for every day late.

Class citizenship & rules of conduct
Cellphones should be set to silent and students must refrain from texting in class.

Students must be respectful of each other. Students should be diplomatic in giving feedback to

their colleagues.

Email correspondence
Email is the preferred form of communication. Students should use their CUNY email account or forward CUNY email to their personal account. Emails sent to the professor should be sent from the CUNY account.

Institutional policies

Honor code
While you are encouraged to discuss ideas with each other to facilitate your learning experiences, the work that is turned in must be your own. For example, allowing someone to copy your work, passing or sharing your answers to others, and/or doing work for others (including computer assignments) are examples of violations of Academic Integrity. For more information please visit and read the University of California Davis website (http://sja.ucdavis.edu/academic-integrity.html) or visit the Center for Academic Integrity at Clemson University (http://www.academicintegrity.org) for a detailed description of academic integrity. One of the more common and more destructive breaches of academic integrity is plagiarism. Visit the Plagiarism.org Learning Center (http://www.plagiarism.org) for more information on how to avoid plagiarism. The concerns and guidelines provided in these websites will be seriously applied in this course. The complete text of the CUNY Academic Integrity policy can be found at this site:
http://www.cuny.edu/about/administration/offices/la/Academic_Integrity_Policy.pdf/.

Disability Act
In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Lehman College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/ or Learning) consult the Office of Special Student Services in the Division of Student Affairs. The Office of Special Student Services is located in Shuster Hall, Room 238, Tel. (718) 960-8441, TTY (718) 960-8931.

The Academic Center for Excellence (ACE) and the Science Learning Center (SLC)
Lehman College has two tutoring centers on campus. The ACE provides appointment-based and drop-in tutoring in the humanities, social sciences and writing, as well as general writing skills. The SLC provides drop-in tutoring for natural and computer science courses. To obtain more information about the ACE and SLC, please visit their website at http://www.lehman.edu/issp, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707.

Last day to drop the course with the grade of "W" is Nov 9, 2015.

Grade of incomplete
The grade of INC is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. The INC grade covers any failure to

complete all requirements for a course, such as submitting a paper or taking a final examination. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average.

A graduate student who receives a grade of INC (incomplete coursework) has a maximum of one year from the time the INC was entered on the transcript to collaborate with the instructor and complete the work. An INC grade entered in a fall semester, for example, must be completed before the end of the next fall semester. An INC grade that has not been made up within one year will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average.

A graduate student who receives a failing grade as a result of a FIN has the option to retake that course at Lehman College and have the FIN grade calculation excluded from the GPA if a grade of C or higher is earned. The original FIN grade remains on the transcript with an indication that the course grade is not included in the computation of the GPA.

A graduate student will receive a stop, issued by the Office of Graduate Studies, that will prevent registration for insufficient progress towards degree completion if two or more INC and FIN grades are acquired. Stops are removed once the student satisfies incomplete coursework.

INC grades cannot be made up after the student graduates (see also "Graduation Procedure").

http://www.lehman.edu/graduate-bulletin/4771.htm

Grade appeals

A graduate student dissatisfied with his/her course grade should first discuss the situation with the instructor who assigned the grade. If the student is still not satisfied that the grade is fair, he/she should then consult the Graduate Program Adviser for the department in which the course was offered. The Graduate Program Adviser will then attempt to resolve the disagreement.

If the student is still dissatisfied, or if the program adviser was the instructor who assigned the grade originally, the student should appeal in writing to the department chair. If the chair is the instructor of the course in question, the senior member of the department Personnel and Budget Committee will act for the chair.

The chair will appoint a Graduate Grade Appeal Committee consisting of three faculty members from the department, all of whom have taught graduate courses. The Graduate Program Adviser may not serve on this committee.

The committee will examine all materials relevant to the appeal, submitted by both the instructor and the student, and will prepare a written report of its findings, either sustaining the original grade or recommending a change. The chair will notify the student, the instructor, and the Office of Graduate Studies of the Committee's decision. If the Committee recommends a grade change, the chair will forward that recommendation (A-1) with the decision.

Grade appeals must be initiated in the semester following the entry of a permanent grade, and no grades can be changed after the date of graduation. The decision of the Graduate Grade Appeal Committee is binding on all parties.

http://www.lehman.edu/graduate-bulletin/4779.htm

Schedule

Session	Date	Topic	Assignments	Format
1	9/1	Course Outline and Introduction		Online
2	9/8	What is a life course approach and why do we study it?	Epi Assignment Due	In-class
3	9/25	Causality	Reaction Paper Due	Online
4	9/29	Types of Data used for Life course approach		In-class
5	10/6	Study Designs and Life course Approach	Reaction Paper Due	Online
6	10/13	Confounding and Life course		Online
7	10/20	Mediators and life course	Reaction Paper Due	In-class
8	10/27	Effect Modifiers and life course		Online
9	11/3	Statistical Analysis and life course		Online
10	11/10	Racial/Ethnic Disparities and life course approach		In-class
11	11/17	Hispanic paradox and life course approach	Draft of grant due	Online
12	11/24	Mental Health and life course approach		In-class
13	12/1	Prevention and the life course approach	Peer-review of grants	Online
14	12/8	Policy Implications	Peer-review of grants	In-class
15	12/15	Grant Due		

Program Competencies	Course Learning goals	Relevant Sessions
This course will help you to achieve the following competencies, which are expected of MPH graduates in Epidemiology	After successfully completing this course, you are expected to be able to:	
1. Apply the core functions of PH practice (assessment, policy development, and assurance)	• Analyze the impact of early programming, cumulative stress, and gene-environment interaction on public health related problems and systems.	1-3
2. Understand basic theories, concepts, models and methods from a range of core and related disciplines and apply them to the design of PH research, policy, and practice	• Identify and understand life course theory and its concepts that explain differences in the health and illness	1-3
3. Apply ethical and social justice principles and standards	• Describe the elements of the life course theory that apply to disparities in health outcomes	10-14
4. Interpret and apply the PH literature	• Retrieve relevant materials, summarize and identify a topic for further exploration over the semester. • Find conflicting interpretations of the same phenomenon and use examples to support your case.	2-5 7-13
5. Communicate PH information verbally and in writing	• Synthesize public health information verbally and in writing	3-14
6. Explain key social, behavioral, biomedical and environmental determinants of and inequities in health and disease across the lifespan in urban settings	• Describe specific pathways by which urban living affects health across the lifespan. • Identify major economic, political, and environmental forces that shape the health of U.S. populations.	1-5
7. Design and evaluate interventions to prevent or control urban PH problems	• Identify current research utilizing the life course perspective	13, 14

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS
Lehman College
PHE 790: Public Health Practice Capstone Seminar
3 Credits
Fall 2015

Time and location	Wednesday 6:00-8:40PM Room GI 429
Instructor	Professor Luisa N. Borrell, D.D.S, Ph.D. Email: Luisa.Borrell@lehman.cuny.edu (best way for contact) Phone: 718- 960-8549 Office: Gillet 336
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Examination of academic, community, government, and private sector public health partnerships from an interdisciplinary perspective, culminating in a seminar project
Course prerequisites	PHE 770
Course format	Seminar
Required reading and resources	Not applicable
Suggested reading and resources	Readings on writing scientific papers would be provided throughout the course as needed.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*

Apply the public health core functions of assessment, policy development and assurance	• Construct a testable research question or practice problem, which
	  ○ can feasibly be addressed within a specified time period
	  ○ is of public health relevance
	  ○ when addressed will fill a knowledge gap
		• Capstone project

Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Place a research question or practice problem within a relevant conceptual framework and the broader public health context • Identify and apply relevant professional or scholarly methods to an investigation or practice problem, including use of a predefined protocol or research plan. • Plan the analysis, synthesis and write up of an investigation from inception to completion including scheduling of items on the critical path to completion	• Capstone project
Adhere to ethical and social justice principles and standards	• Analyze relevant ethical or social justices issues using widely recognized principles or standards. • Obtain IRB or IACCU approval or exemption if appropriate. • Conduct any public health investigations involving human subjects in accordance with OHRPP ethical performance standards, including maintenance of confidentiality and security.	• Capstone project
Interpret and analyze public health literature and apply evidence-	• Implement a structured search of the literature. • Summarize the literature to date, including quantitative	• Capstone project

based research	associations and qualitative themes, on a specific topic taking into account levels of evidence • Identify weaknesses within existing literature, such as addressing the wrong question, lack of comparison groups, biases or limited generalizability	
Apply basic statistical and informatics techniques	• Generate summarized descriptive information from PH data, such as frequencies and cross-tabulations • Assess qualitative data according to accepted methods, such as componential analysis. • Identify the key findings of a study or practice experience. • Provide sources of information for all statements of fact in the draft through use of a citation manager • Present PH information in figures, tables and graphs, such that each figure/table/graph is interpretable, self-explanatory and can be read standalone	• Capstone project
Communicate public health information through oral, written, digital and visual presentation	• Identify the interests of different stakeholders in the findings • Make an oral or poster presentation conveying key findings to a defined audience contextualized within current knowledge and interests of stakeholders, as well as with due acknowledgement of strengths and weakness of findings. • Write a document a public health problem such as a research report, program evaluation, analytic paper or policy analysis, using language appropriate for a professional public health audience.	• Capstone project
Explain how social, behavioral, biomedical and environmental determinants affect population health	•	

Design and evaluate interventions to prevent or control public health problems	• Implement the analysis, synthesis and writing plan for the culminating writing experience according to a predefined plan • Discuss the implications of a study or evaluation to address the needs for future evaluation and research, or for the development and implementation of programs and policies.	• Capstone project
Collect, analyze and interpret public health data	• Synthesize findings within the context of existing knowledge with acknowledgement of the strengths, weaknesses of the findings and gaps in knowledge that remain, and the corresponding implications for interpretation • Identify issues with reliability and validity of findings and explain their likely implications. • Justify methods of measurement • Identify public health implications of an investigation	• Capstone project and poster presentation
Engage and collaborate with diverse groups	•	• Capstone project and poster presentation
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	•	• Capstone project
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	•	• Capstone project
Explain the context of public and	•	• Capstone project

private health-care systems in which health care and public health policy are made and healthcare is delivered		

Course Assessments

Student grades will be based on:

a) Poster presentation (40%): Students are expected to present their project to students and faculty in the Department and to answer questions on their project.
b) Capstone Project (60%): Students will be expected to complete their project and format it for submission to the Library Thesis Archives. Please visit the Library Master's Theses Database Digital Depository for submission instructions http://www.lehman.cuny.edu/library/master-thesis-database.php

Grading

Evaluation criteria

The relative weight of each course component is as follows:

Assessment	Weight
Poster presentation	40%
Capstone Project	60%
	100%

The grading system for the course follows guidance in the Graduate Bulletin:

Letter Grade	Points	Quality Points
A	93-100	4.0
A-	90-92	3.7
B+	87-89	3.3
B	83-86	3.0
B-	80-82	2.7
C+	77-79	2.3
C	73-76	2.0
C-	70-72	1.7
F, WU	<=69	0

Withdrawal

The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete
The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

Students are expected to attend classes regularly, and instructors are required to record attendance for grading and counseling purposes. Individual instructors, as well as departments or degree programs, may establish specific attendance requirements. Instructors have the right to weigh attendance and class participation in determining grades. It is the student's responsibility to ascertain the effect attendance may have on the grade in a course. Students receiving financial aid must be certified as attending classes regularly for continuing eligibility.

Late/incomplete submission of assignments

Late submission assignment would be impact your final grade.

Make-ups, rewrites, and extra credit

There is not make up or rewrites for the draft submission assignments.

Expectations of students
Students are expected to come to class on time. In addtion, they would not be allowed to use cell phone or do e-mails during class.

Expectations for the instructor
The instructor would be available face to face or by e-mail to answer any question or clarify any issues students may have on any aspects of the course.

Accessibility

Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, at 718-960-8441.

Academic integrity

The faculty and administration of Lehman College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Lehman College procedure for implementing the policy can be found in the Graduate Bulletin.

Course Schedule– Update 08/10/15

**Please note that the schedule is subject to change throughout the semester.

Session	Date	Topic	Assignment*
1	09/02	Overview of course and Students' Project	
2	09/09	Class meeting – Introduction & Methods	
3	09/16	Class meeting – Results & Discussion	
4	09/23	Yom Kippur – No class	**Outline Draft due @ Midnight**
5	09/30	No class meeting	
6	10/07	Meeting as needed	
7	10/14	Meeting as needed – Individual meetings	**First Paper Draft due @ Midnight**
8	10/21	Class meeting – Poster Presentation	
9	10/28	Meeting as needed– Individual meetings	
10	11/04	Class Meeting	**Full Paper Draft due @ Midnight**
11	11/11	Meeting as needed– Individual meetings	**Poster Draft due @ Midnight**
12	11/18	Class Meeting	
13	11/25	Meeting as needed– Individual meetings	**Final Poster Draft due @ Midnight**
14	12/02	Meeting as needed– Individual meetings	**Please note poster must be ready for print by 9AM on Monday December 7th**
15	12/09	Poster Presentations	
16	12/16	Final Paper due @ 5PM	

*Please be aware that you will get comments within 7 to 10 days on your drafts via e-mail using the track changes tool on MS Word.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Lehman College
PHE 791: Workshop in GISc Research for Public Health
4 Credits
Fall 2015

Time and location	Hybrid, with at least four in-person meetings from 9:30 AM – noon on Thursdays, 322 Gillet Hall (GISc lab)
Instructor	Dr. Glen Johnson, Associate Professor **glen.johnson@lehman.cuny.edu** (preferred communication method)
Office hours	Wednesday 3:30-5:00 pm, Thursday noon-1:30 pm, or by appointment, in 413 Gillet Hall
Course website	See "2015 Fall Term PHE 791 0" at https://bbhosted.cuny.edu
Support resources	Lehman College has two tutoring centers on campus. The **Academic Center for Excellence (ACE)** provides appointment-based and drop-in tutoring in the humanities, social sciences and writing, as well as general writing skills. The **Science Learning Center (SLC)** provides drop-in tutoring for natural and computer science courses. To obtain more information about the ACE and SLC, please visit their website at http://www.lehman.edu/issp, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707.
Course description	An advanced examination of mapping and of new computer-aided technologies in the natural and social sciences, including research design and methodology and designing and conducting an independent GIS public health research project, conforming to generally acceptable professional geographical practices and techniques, under the supervision of faculty.
Course prerequisites	PHE 706 or departmental permission
Course format	Hybrid, online communication and monthly in-person meetings
Required reading and resources	▪ *"An Introduction to Scientific Research Methods in Geography*," by D. Montello and P. Sutton, Sage Publications, 2006. (Available at Lehman College Bookstore)

	▪ "*Research Design and Proposal Writing in Spatial Science*," by J. Gatrell, G. Bierly, and R. Jensen, Springer Publications. (Available on Blackboard)

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Express theoretical foundations of Geographic Information Science (GISc), cartography, and geography in general • Integrate spatial analysis and GISc applications in an interdisciplinary manner, incorporating information and research questions from other fields, such as public health	Final project presentation and report
Apply basic statistical and informatics techniques	• Design, implement, and present a substantive research project using GISc as the organizing framework	Final project presentation and report
Adhere to ethical and social justice principles and standards	•	Final project presentation and report
Interpret and analyze public health literature and apply evidence-based research	• Perform a comprehensive literature review of a public health research topic that requires GISc as part of a solution.	Final project presentation and report
Apply basic statistical and informatics techniques	• Acquire, process and analyze data, including accurate mapping and geo-spatial analyses	Final project presentation and report
Communicate public health information through oral, written, digital and visual presentation	• Design and create accurate, meaningful and unbiased maps and cartographic products that are easily understood by the target audience	Final project presentation and report
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Identify associations between determinants and health outcomes at the level of individuals and communities	Final project presentation and report

Design and evaluate interventions to prevent or control public health problems	•	Final project presentation and report
Collect, analyze and interpret public health data	• Interpret, acquire, manage, analyze, display, and synthesize geospatial data, using both quantitative and qualitative methods	Final project presentation and report
Engage and collaborate with diverse groups	•	Final project presentation and report
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	•	Final project presentation and report
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	•	Final project presentation and report
Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	•	Final project presentation and report

Course Assessments
Understanding of the course material will be evaluated through a series of deliverable products, leading to a final report and presentation:

Grading
The relative weight of each course component is as follows:

Assessment	*Weight*
Submission and in-class presentation of Interim Deliverables in Weeks 5 and 9	30%
Successful completion of research project by Week 13, with PowerPoint oral presentation of project in Week 13	30%
Preparation and submission of written report and poster illustrating your project by Week 15	40%
	100%

The grading system for the course follows guidance in the Graduate Bulletin:

Percentage	Letter Grade	Quality Points
94-100	A	4.0
90-93	A-	3.7
87-89	B+	3.3
84-86	B	3.0
80-83	B-	2.7
77-79	C+	2.3
70-76	C	2.0
69 and below	F, WU	0

Withdrawal
The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete
The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements

of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing, giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

Students are expected to attend classes regularly, and instructors are required to record attendance for grading and counseling purposes. Individual instructors, as well as departments or degree programs, may establish specific attendance requirements. Instructors have the right to weigh attendance and class participation in determining grades. It is the student's responsibility to ascertain the effect attendance may have on their grade in a course. Students receiving financial aid must be certified as attending classes regularly for continuing eligibility.

Academic Integrity

While you are encouraged to discuss ideas with each other to facilitate your learning experiences, the work that is turned in must be your own. For example, allowing someone to copy your work, passing or sharing your answers to others, and/or doing work for others (including computer assignments) are examples of violations of Academic Integrity. For more information please visit and read the University of California Davis website (http://sja.ucdavis.edu/academic-integrity.html) or visit the Center for Academic Integrity at Clemson University (http://www.academicintegrity.org) for a detailed description of academic integrity. One of the more common and more destructive breaches of academic integrity is plagiarism. Visit the Plagiarism.org Learning Center (http://www.plagiarism.org) for more information on how to avoid plagiarism. The concerns and guidelines provided in these websites will be seriously applied in this course. The complete text of the CUNY Academic Integrity policy can be found at this site:
http://web.cuny.edu/academics/info-central/policies/academic-integrity.pdf

Accessibility

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Lehman College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/ or Learning) consult the Office of Special Student Services in the

Division of Student Affairs. The Office of Special Student Services is located in Shuster Hall, Room 238, Tel. (718) 960-8441, TTY (718) 960-8931.

Syllabus Modification
The instructor may modify the syllabus and study plan.

Course Schedule

Week 1 – Meet to discuss course requirements, reading materials, and preliminary research concepts

Weeks 1-4:
- Read: Montello and Sutton, Chapter 1 - Introduction: A Scientific Approach to Geography; Chapter 2 - Fundamental Research Concepts; Chapter 3 - Data Collection in Geography: Overview; Chapter 9 - Statistical Data Analysis; Read: Gatrell et al, Chapter 1 - Spatial Science and its Traditions; Chapter 2 - Literature Reviews; Chapter 3 - Research Questions; Chapter 4 - Data and Methods in Spatial Science.
- Select research topic, and conduct literature review on topic, examine other research on topic;
- Prepare written Initial Research Design, including hypothesis or questions to be answered;
- Conduct a Preliminary Data Needs Assessment and Data Acquisition;

Week 5 – Presentation of Preliminary Research Design and literature review

WEEK 5 DELIVERABLES:
- Short (one-pager) description of your narrowed-down project, including one or more laser-sharp, pin-pointed research questions;
- List of data sets needed, including data sources and status of acquisition for each data set;
- Flow Chart of project design (GIS analysis portion of project only);
- Be prepared to discuss your research design and literature review.

Weeks 5-8:
- Read: Chapter 10 - Data Display: Tables, Graphs, Maps, Visualizations; Chapter 11 - Reliability and Validity; Chapter 12 - Geographic Information Techniques in Research
- Refine research methodology;
- Capture and input necessary data;
- Preliminary data analysis;

Week 9 – Interim Progress Report on research projects

WEEK 9 DELIVERABLES:
- At least one preliminary Map Layout and one-pager on Preliminary findings.

Weeks 9-12:
- Read: Chapter 13 - Scientific Communication in Geography; Chapter 14 - Ethics in Scientific Research;
- Analysis of data;
- Map and charts production;
- Prepare draft findings;
- Prepare Power Point or Prezi presentation of project background, methods, analysis, and conclusions.

Week 13 – Presentation of Research Results

WEEK 13 DELIVERABLES:
- Oral Presentation of Project, via PowerPoint slides, Prezi, or other mode.

Week 13-15:
- Prepare final maps and charts and written report of findings;
- Prepare large-format PowerPoint slide of poster of project.

Week 15 – Final Project Due (all materials to be submitted no later than December 17, 2015)

WEEK 15 DELIVERABLES:
- Final Project Report;
- PowerPoint Slide of Large-format Poster of Project.
- Final PowerPoint Presentation of Project.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS
PUBH 800 and PH 770.77
Cities, Society and Health
3 Credits
Fall 2015

Time and location	Mondays 6:30 –8:25 pm, Room 3310 at the Graduate Center, 365 Fifth Avenue
Instructor	Nicholas Freudenberg, DrPH Room 3317. Tel: 212-396-7738 Email: nfreuden@hunter.cuny.edu
Office hours	Office Hours: Mondays 5-6:15 pm or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course presents an ecological, multilevel approach to the study of urban health and brings together public health and social science disciplines to examine the impact of city living on population health. Its focus is on the social determinants of health in US urban populations in the post-World War II period and on the causes of persistent health inequalities in US and other cities. It is required for all DPH students
Course prerequisites	None for DPH students, Instructor's Permission for 770.77
Course format	This course is taught with a mix of online learning resources, in class lectures and discussions, collaborative exercises and written assignments.
Required reading and resources	See weekly reading assignments below
Suggested reading and resources	See suggested readings for each week, suggested books and suggested readings on health impact assessment at the end of this syllabus

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to achieve the following DPH competencies:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
1. Describe the role of social, political, biological, economic, historical, behavioral and environmental factors in health and disease in urban settings and identify opportunities for interventions to improve population health at individual, community, city and policy levels 2. Explain the mechanisms and pathways by which urban conditions affect health and the roles of various urban systems in promoting health and preventing disease; 3. Explain the value and limitations of multilevel, ecological models in the study of urban health and apply such models to the investigation of specific health problems. 4. Apply concepts, theories and methods from two or more disciplines to the study of urban health	1. Describe the various pathways and mechanisms by which city living and urban social conditions affect health; 2. Identify major social, economic, political and environmental forces that have shaped the health of U.S. urban populations in the past several decades; 3. Discuss the impact of major global, national and local trends on the health of urban populations in high, middle and low income nations; 4. Describe a framework for understanding the determinants of differences in health between and within urban and non-urban populations; 5. Explain the roles of public health professionals and social science researchers in studying and taking action to improve the health of urban populations. 6. Describe the role of various municipal systems (e.g., educational, health care, public health, environmental protection, criminal justice, food and nutrition, social services) in promoting health and preventing disease. 7. Apply the method of health impact assessment to study of urban health 8. Identify your strengths and weaknesses in writing for the professions	**1. Class Participation (Individual, 10%):** Students are expected to attend class regularly, participate actively, complete and be prepared to discuss with insight readings and other assignments. There will also be 2-3 short Blackboard assignments on class readings that contribute to this portion. **2. Blackboard Assignments (10%):** Each student is expected to post 2 short essays on Blackboard (Bb), described below. 3. **Meetings with instructor (5%):** Each student is expected to schedule at least one individual meeting with an instructor to get feedback on writing. 4. **Critical Book Review (Individual, 5%):** Due first class session. See pp.11-12 for details. 5. **Paper (Group and Individual, 65%):** The main assignment for the course is a 4-part paper; each component is due as specified below. Each of the 3 first papers are 15% of the grade; the final paper is 20%. The final, revised paper includes the 3 initial components along with additional components. The combined paper is due at the end of the semester. 6. **Final Paper Presentation (5%)** Participate in an interactive presentation of final project, format to be discussed.

The grading system for the course is as follows:

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITYfor Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Assignments

1. *Scoping review*. Identify, define and describe a specific social process that contributes to one or more adverse health conditions or health inequities in NYC or some other specified urban area. Your 6-7 page typed double spaced paper (text, images and references don't count towards limit) should explain and to the extent possible quantify the public health significance of the problem(s), summarize what is and is not known about the causal pathways by which the social process contributes to the health condition(s) or disparities, and identify 1-2 policy questions facing New York or another city that your overall health impact assessment seeks to answer. This and all future papers should use the Index Medicus (*JAMA, NEJM, AJPH*) style of references. Due October 19.
2. *Health impact assessment*. Based on first paper on social processes, select a specific policy or organizational practice that contributes to adverse health conditions or health inequalities in a specific urban setting. Summarize available evidence on the origins of the policy or practice. Your summary should include perspectives from at least three disciplines or sectors. Critically review evidence on the health impact of this policy or practice, summarizing what is known about adverse impact. Identify gaps in our understanding of impact and propose at least 2-3 specific research strategies or data sources to fill these gaps. Due Nov 9
3. *Recommendations for action*. Propose one or two specific changes in organizational practices or policy that would mitigate or prevent the adverse health consequences. Critically analyze the evidence that supports these recommendations. Analyze the economic and political obstacles that those seeking to implement your recommendations might encounter and suggest strategies to overcome these obstacles. Due Nov 23.
4. *Issue Brief*. Write a 4 page Issue Brief that summarizes the three papers for policy makers and advocates. Due Dec 14.

Oral reports on project on Dec 14 and 21

The table below gives some examples of the types of topics for each of the papers. These are meant to be illustrative, not limiting.

Social Process	***Policies***	***Social Practices***	***Possible Health Impact***
"the means by which certain patterns of social organization are created or maintained"; the cumulative policies, practices and methods of allocation that maintain the status quo in a specified domain	Laws or court decisions that mandate allocation of resources or services to achieve specified end	Implementation, enforcement, and informal actions that organizations take to implement written and unwritten policies	Specific population health outcomes for which specified policies or social practices play a causal role
A food production system that makes highly processed foods more affordable and available to low income populations	Federal subsidies for corn, sugar and soy; Tax deduction for all food marketing expenses	Implementation of school food programs; targeted marketing of unhealthy food to Blacks and Latinos	Changes in prevalence or incidence of obesity or Type 2 diabetes
A housing market that cannot provide adequate affordable or safe housing for some	Federal support for low income housing, mortgage	Setting definition of affordable housing too high for many low	Declines in federal support for low income housing

populations	guarantees for middle class home owners	income people to afford; redlining to keep neighborhoods segregated by race	contribute to homelessness and its adverse physical and mental health consequences.
An educational system that allocates resources and sorts students by class and race	Funding education through local property taxes , zero tolerance disciplinary policies	Implementation of disciplinary policies in ways that push out students of color	Higher lifetime premature mortality and preventable illness for those who do not graduate high school
Criminal justice policies that reinforce and maintain inequalities in health and employment and other opportunities	Three strikes and you're out, stop and frisk	Few community reentry services, differential policing practices in Black and Latino communities	Untreated mental illness and substance use problems

Summary of Topics

Session	Date	Topic	Assignments due
Session 1.	Aug 31	**Cities and Health: An Overview**	Critical book review
Session 2.	Sept 10 class meets om Thurs	**Health Impact Assessment: A method for assessing influences on health?**	Topic for social process paper BB assignment 1
Session 3.	Sept 21	**Compared to what: Historical perspectives**	
Session 4.	Sept 28	**Compared to what: Developing world perspectives**	
Session 5.	Oct 5	**?**	
	Oct 12	**No class, America discovers Columbus**	
Session 6.	Oct 19	**Race, racism and the health of cities**	Paper 1 due
Session 7.	Oct 26	**Urban governance and health**	
Session 8.	Nov 2	**How housing and the built environment influence health**	
Session 9.	Nov 9	**Urban Food Systems: Who eats what?**	Paper 2 due
Session 10.	Nov 16	**?**	BB Assignment 2 due
Session 11.	Nov 23	**Changing people, communities, policies or structures? Intervening at multiple levels to improve health**	Paper 3 due
Session 12.	Nov 30	**Advancing health equity: what strategies work?**	
Session 13.	Dec 7	**Intersectoral action for health**	
Session 14.	Dec 14	**Towards an Urban Health Agenda** **Student reports**	Paper 4 due and Oral Report due
Session 15.	Dec 21	**Student reports**	

Overview of Assignments

Blackboard Assignments: By September 10, post on Discussion Board 1 an image of yourself and a two paragraph profile that summarizes what you *already know* about urban health and related topics that may benefits your classmates and *what you need to know* to achieve your professional objectives. By November 16, post on Discussion Board 2 an image or short video(you can use a link) that shows some dimension of urban health or urban life that is important to you and two paragraphs explaining its importance to you and your professional or personal goals for making changes in this area in the next 10 years.

The main assignment for this course is a four-part paper, each component due as specified and a fifth final revised paper including all prior parts due at the end of the semester. You can complete the first *three* papers with one other student; the final two assignments are completed separately by each student.

Class Presentation (5%). Each student will give a 5 minute presentation (timing strictly enforced) on their policy report using no more than 20 slides. For information on the PechaKucha method, on which this assignment is based, visit:
http://www.pechakucha.org/

Note on assigned readings:

Where possible we have chosen readings that are available online and have included links that worked as of July 2014. These links often break or are changed. Please do not contact me if the link doesn't work—use Google or other search engines to find a working link or look in the online GC library collection. Being able to find resources is an important skill for public health researchers and your occasional frustrations in finding what you need will eventually lead to good skills in retrieving needed evidence. Articles not available on line are posted in the course Bb website. Make sure you learn how to use Blackboard after you have registered for the Fall semester. More information at:
https://bbhosted.cuny.edu/webapps/portal/frameset.jsp?tab_tab_group_id=_96_1

CUNY-Graduate Center Policies

INC Grades. To resolve incomplete grades, students must fulfill their obligations within one calendar year after completion of the course. After one year, an incomplete ("INC") will automatically be transformed into an "INC'' (permanent incomplete); extensions will be granted only in exceptional circumstances upon written application and with the permission of the faculty member, the Executive Officer, and the Vice President for Student Affairs. Permanent incompletes will accrue no credit. Incomplete grades cannot be changed to letter grades after a student has been advanced to candidacy and has been moved to Level III. Students with more than two incomplete courses will be brought to the attention of their Executive Officer to determine whether or not they are making satisfactory progress. Students will not normally be regarded as making satisfactory progress toward their degrees if they have more than two INCs on their records. (Please refer to "Standards for Retention,", and to page 63 in the Graduate Center handbook.) Students should be aware that continued registration and most financial aid awards are conditional upon satisfactory progress. Students should also note that credits for which they have an INC as of the end of the third week of classes of a given semester are not counted toward advancement to the next level for that semester.

HONOR CODE & ACADEMIC INTEGRITY

While you are encouraged to discuss ideas with each other to facilitate your learning experiences, the work that is turned in must be your own. For example, allowing someone to copy your work, passing or sharing your answers to others, and/or doing work for others (including computer assignments) are examples of violations of Academic Integrity. For more information please visit and read the University of California Davis website (http://sja.ucdavis.edu/academic-integrity.html) or visit the Center for Academic Integrity at Clemson University (http://www.academicintegrity.org) for a detailed description of

academic integrity. One of the more common and destructive breaches of academic integrity is plagiarism. Visit the Plagiarism.org Learning Center (http://www.plagiarism.org) for more information on how to avoid plagiarism. The concerns and guidelines provided in these websites will be seriously applied in this course.

INFORMATION ABOUT ACCESS TO THE OFFICE OF DISABLED STUDENTS
Among other responsibilities, the CUNY Graduate Center Vice President for Student Affairs has overall responsibility for Student Disability Services and is the 504/ADA Coordinator.

ADDITIONAL COURSE INFORMATION
Vice President for Student Affairs - Matthew G. Schoengood
Room: GC 7301; telephone: 212-817-7400; e-mail: studentaffairs@gc.cuny.edu

PH 800 Fall 2014 Readings and Assignment Due Dates

Session Date/ Assignments Due	**Topic and Readings**
A suggested supplementary test is Freudenberg N, Galea S & Vlahov D. *Cities and the Health of the Public*. Vanderbilt Press, 2006. Especially recommend for those without prior public health experience in urban communities. Available from various online book stores. Required readings are available by link below or on Bb.	
1. Aug 31 Critical book essay due	**Overview : Changing Public Health in NYC:1990-2014** Althoff KN, Karpati A, Hero J, Matte TD. Secular changes in mortality disparities in New York City: a reexamination. J Urban Health. 2009;86(5):729-44. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2729862/ Freudenberg N, Fahs M, Galea S, Greenberg A. The impact of New York City's 1975 fiscal crisis on the tuberculosis, HIV, and homicide syndemic. Am J Public Health. 2006 Mar;96(3):424-34. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1470515/ Lowery A. Study Finds Greater Income Inequality in Nation's Thriving Cities. New York Times, February 20, 2014. Available at: http://www.nytimes.com/2014/02/20/business/economy/study-finds-greater-income-inequality-in-nations-thriving-cities.html?_r=0 Preston SH, Elo IT. Anatomy of a municipal triumph. Pop & Dev Review 2014;40(1):1-29. Available at: http://www.popcouncil.org/uploads/pdfs/councilarticles/pdr/PDR401Preston.pdf Roberts S. Poverty Rate Is Up in New York City, and Income Gap Is Wide, Census Data Show. New York Times, September 19, 2013. Available at: http://www.nytimes.com/2013/09/19/nyregion/poverty-rate-in-city-rises-to-21-2.html Krieger, N. Theories for Social Epidemiology in the 21st Century: An Ecosocial Perspective. International Journal of Epidemiology. 2001; 30:669-677. http://ije.oxfordjournals.org/content/30/4/668.full.pdf+html
	View: http://www.grahaphics.com/Income-Inequality-in-NYC Suggested Reading: New York Times series on income inequality in NYC: http://www.nytimes.com/projects/2013/invisible-child/#/?chapt=3
2. Sept 10, class meets on Thursday Submit topics &	**Health Impact Assessment**
	Phelan JC, Link BG, Tehranifar P. Social conditions as fundamental causes of health inequalities: theory, evidence, and policy implications. J Health Soc Behav. 2010; 51 Suppl:S28-40. Bhatia R, Corburn J. Lessons from San Francisco: health impact assessments have advanced political conditions for improving population health. Health Aff (Millwood). 2011 Dec;30(12):2410-8. http://content.healthaffairs.org/content/30/12/2410.full.pdf+html

groups for paper 1, Bb assignment 1 due	Bourcier E, Charbonneau D, Cahill C, Dannenberg AL. An evaluation of health impact assessments in the United States, 2011-2014. Prev Chronic Dis. 2015 Feb 19;12:E23. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4335614/pdf/PCD-12-E23.pdf National Research Council (US) Committee on Health Impact Assessment. Improving Health in the United States: The Role of Health Impact Assessment. Washington (DC): National Academies Press (US); 2011. http://iom.nationalacademies.org/~/media/Files/Activity%20Files/Environment/EnvironmentalHealthRT/2011-Nov-RT/132291.pdf
	Documentary Video: Watch one of these: Facets of Health Impact Assessment. http://www.ncchpp.ca/546/Video.ccnpps?id_article=1194 Health Impact Assessment Helps Families Replace Unsafe Manufactured Housing https://www.youtube.com/watch?v=kGJvLeVJ41w Two Policy Makers in Kansas explain their perspectives on HIA https://www.youtube.com/watch?v=Z5t9NpH_AzE
3. Sept 21 Final changes in topics & groups for papers 1 and 2	**Compared to what? Historical Perspectives from United States and Europe**
	Szreter S. The population health approach in historical perspective. Am J Public Health. 2003;93(3):421-31. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449802/pdf/0930421.pdf Lerner BH. New York City's Tuberculosis Control Efforts: The Historical Limitations of the 'war on tuberculosis'. *American Journal of Public Health*. 1993; 83:758-66. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1694703/pdf/amjph00529-0136.pdf NYC DOHMH. Protecting Public Health in New York City: Two Hundred Years of Leadership 1805-2005. New York, 2006. http://www.nyc.gov/html/doh/downloads/pdf/bicentennial/historical-booklet.pdf Frieden TR, Bassett MT, Thorpe LE, Farley TA. Public health in New York City, 2002-2007: confronting epidemics of the modern era. Int J Epidemiol. 2008 Oct;37(5):966-77. http://ije.oxfordjournals.org/content/37/5/966.full.pdf+html *Blackboard Homework Assignment* (Based on last week's session) Post by 9/19: Select 2 articles from Selected Readings on Health Impact Assessment (pp. 16-17) based on relevance to your semester paper and post on Bb 3 research highlights from the article (no more than 100 characters each); Read posts from other class members before coming to class.
4. Sept 28	**Compared to What : Developing World Perspectives**
	Harpham, T. 2009. Urban health in developing countries: What do we know and where do we go? Health & Place, 15.1 (March): 107-116. On Bb Gong P, Liang S, Carlton EJ, Jiang Q, Wu J, Wang L, Remais JV. Urbanisation and health in China. Lancet. 2012; 379(9818):843-52. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3733467/pdf/nihms-497536.pdf Zhu YG, Ioannidis JP, Li H, Jones KC, Martin FL. Understanding and harnessing the health effects of rapid urbanization in China. Environ Sci Technol. 2011;45(12):5099-104. http://pubs.acs.org/doi/pdf/10.1021/es2004254 Turley R, Saith R, Bhan N, Rehfuess E, Carter B. Slum upgrading strategies involving physical environment and infrastructure interventions and their effects on health and socio-economic outcomes. Cochrane Database Syst Rev. 2013 Jan 31;1:CD010067.
5. Oct 5	**TBA**
Oct 12	**No class—Columbus Day-- America encounters Columbus**
6. Oct 19	**Race, Racism, Segregation & Health**
	Bassett MT. #BlackLivesMatter--a challenge to the medical and public health communities. N Engl J Med. 2015;372(12):1085-7. http://www.nejm.org/doi/pdf/10.1056/NEJMp1500529

	Geronimus A, Thompson PT. Racial inequality in health and policy-induced breakdown of African American Communities. in *Urban Health and Society*, Freudenberg et al, eds. Jossey Bass, 2009;127-160. On Bb. Schulz AJ, Williams DR, Israel BA, Lempert LB. Racial and spatial relations as fundamental determinants of health in Detroit. Milbank Q. 2002;80(4):677-707. http://deepblue.lib.umich.edu/bitstream/handle/2027.42/71561/1468-0009.00028.pdf?sequence=1&isAllowed=y McCord, C. and Freeman, H.P. 1990. Excess mortality in Harlem. *New England Journal of Medicine.* 322:173-177. http://www.nejm.org/doi/full/10.1056/NEJM199001183220306 Williams DR, Mohammed SA. Discrimination and racial disparities in health: evidence and needed research. J Behav Med. 2009 Feb;32(1):20-47. http://scholar.harvard.edu/files/davidrwilliams/files/2009-discrimination_and_racial-williams.pdf
Documentary: Unnatural Causes: "When the Bough Breaks". View segment How Racism Affects Pregnancy. http://www.unnaturalcauses.org/about_the_series.php http://www.unnaturalcauses.org/video_clips_detail.php?res_id=70	
7 Oct 26	**Urban Governance & Health**
	Katz R Mookherji S, Kaminski M, Haté V, Fischer JE. Urban Governance of Disease**.** *Adm. Sci.* **2012**, *2*, 135-147; doi:10.3390/admsci2020135. Available at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0CDsQFjAD&url=http%3A%2F%2Fwww.mdpi.com%2F2076-3387%2F2%2F2%2F135%2Fpdf&ei=vOLcU52gGqfLsASImYKgDA&usg=AFQjCNGM61fB20UTOiTL6ugIRyvCNtKuHg&sig2=FCBw_TzZ1z69xYqJ3ld21A&bvm=bv.72197243,d.cWc Burris S, Hancock T, Lin V, Herzog A. Emerging strategies for healthy urban governance. J Urban Health. 2007;84(3 Suppl):i154-63**.** Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1891653/pdf/11524_2007_Article_9174.pdf Barten F, Akerman M, Becker D, Friel S, Hancock T, Mwatsama M, Rice M, Sheuya S, Stern R. Rights, knowledge, and governance for improved health equity in urban settings. J Urban Health. 2011; 88(5):896-905. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3191211/
8. Nov 2	How Housing, the Built Environment and the Urban Form Influence Health
	Saegert, S., & Evans, G. Poverty, Housing Niches, and Health in the U.S.. Journal of Social Issues, 2003 ; 59, 569- 590. On Bb Rydin Y, Bleahu A, Davies M, et al. . Shaping cities for health: complexity and the planning of urban environments in the 21st century. Lancet. 2012 ;379(9831):2079-108. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3428861/ Friel S. Toward a research and action agenda on urban planning/design and health equity in cities in low and middle-income countries. J Urban Health. 2011;88(5):875-85. Kjellstrom T, Friel S, Dixon J, Corvalan C, Rehfuess E, Campbell-Lendrum D, Gore F, Bartram J. Urban environmental health hazards and health equity. *J Urban Health*. 2007;84(3 Suppl 1):86-97. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1891648/pdf/11524_2007_Article_9171.pdf Read one of the two below and come prepared to discuss: Evans GW. The built environment and mental health. J Urban Health. 2003; 80(4):536-55. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3456225/pdf/11524_2006_Article_257.pdf Durand CP, Andalib M, Dunton GF, Wolch J, Pentz MA. A systematic review of

	built environment factors related to physical activity and obesity risk: implications for smart growth urban planning. Obes Rev. 2011 May;12(5):e173-82. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3079793/pdf/nihms245519.pdf
	View "Poor housing and its implications for children's health and well-being" https://www.youtube.com/watch?v=R4ZZD_CYSB8
9. Nov 9 2nd paper due	**Urban Food Systems: Global and local perspectives on who gets what**
	Hawkes C. Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases *Globalization and Health* 2006, **2:**4 http://www.globalizationandhealth.com/content/pdf/1744-8603-2-4.pdf Dixon J, Omwega AM, Friel S, Burns C, Donati K, Carlisle R. The health equity dimensions of urban food systems. J Urban Health. 2007 May;84(3 Suppl):i118-29 . http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1891642/pdf/11524_2007_Article_9176.pdf Executive Summaries of: Good Food Jobs http://nycfoodpolicy.org/wp-content/uploads/2013/05/JOBS_EXSUMM.pdf and The Public Plate in NYC http://nycfoodpolicy.org/wp-content/uploads/2013/05/PUBLICUBLICPLATE.EXSUM_.pdf Recommended: *MMWR. Achievements in Public Health, 1900-1999: Safer and Healthier Foods. 1999; 48(40):905-913.* Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4840a1.htm
	Documentary: "Baltimore Food Ecology Documentary" https://www.youtube.com/watch?v=LD3Zsjmyohw
10. Nov 16	**Biology?**
	1. Epstein H. Enough to Make You Sick? Something is Killing America's Urban Poor. NY Times Magazine12 October 2003. http://www.mindfully.org/Health/2003/Urban-Poor-Sick12oct03.htm 2. McEwen BS & Wingfield JC. 2002. "The concept of allostasis in biology and biomedicine." Hormones & Behavior. 2002; 43(1):2-15. 3. Hertzman C, Boyce T. How experience gets under the skin to create gradients in developmental health. Annu Rev Public Health. 2010 Apr 21;31:329-47 4. Dowd JB, Haan MN, Blythe L, Moore K, Aiello AE. Socioeconomic gradients in immune response to latent infection. Am J Epidemiol. 2008 Jan 1;167(1):112-20. Available at: http://aje.oxfordjournals.org/cgi/reprint/167/1/112 Recommended: Pearlin LI, Schieman S, Fazio EM, Meersman SC. Stress, health, and the life course: Some conceptual perspectives. Journal of Health and Social Behavior. 2005; 46(2):205-19. Cohen S, Janicki-Deverts D, Miller GE. Psychological Stress and Disease. JAMA. 2007; 298(14):1685-7
11. Nov 23 Paper 3 due	**Changing people, communities, policies or structures? Intervening at multiple levels to improve health**
	Freudenberg N. Interventions to improve urban health. From Cities and the Health of the Public, Freudenberg N, Galea S and Vlahov D, eds. Vanderbilt University Press, 2006. pp. 294-326. On Bb. Freudenberg N, Franzosa E, Chisholm J, Libman K. New approaches for moving upstream: how state and local health departments can transform practice to reduce health inequalities. Health Educ Behav. 2015 Apr;42(1 Suppl):46S-56S. http://heb.sagepub.com/content/42/1_suppl/46S.full.pdf+html Cassidy T, Inglis G, Wiysonge C, Matzopoulos R. A systematic review of the effects of poverty deconcentration and urban upgrading on youth violence. Health Place. 2014;26:78-87. On Bb

	Jacobs D. et al. A Systematic Review of Housing Interventions and Health: Introduction, Methods, and Summary Findings. J Public Health Management Practice, 2010, 16(5) E-Supp, S5–S10. http://journals.lww.com/jphmp/Fulltext/2010/09001/A_Systematic_Review_of_Housing_Interventions_and.3.aspx# Stokols D. Translating Social Ecological Theory into Guidelines for Community Health Promotion. American Journal of Health Promotion. 1996;10(4):282-298. https://webfiles.uci.edu/dstokols/Pubs/Translating.PDF
12. Nov 30	**Strategies for Advancing Health Equity in Cities**
	CUNY School of Public Health. Advancing Health Equity in New York City A Report by the Division of Public Health Practice and Community Engagement of the City University of New York School of Public Health. 2015. http://sph.cuny.edu/wp-content/uploads/2015/06/Health-Equity-Report-2015.pdf Stephens C. Urban inequities; urban rights: a conceptual analysis and review of impacts on children, and policies to address them. J Urban Health. 2012;89(3):464-85. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3368043/ CUNY SPH Immigration Report TBA. Hankivsky O, Grace D, Hunting G, Giesbrecht M, Fridkin A, Rudrum S, Ferlatte O, Clark N. An intersectionality-based policy analysis framework: critical reflections on a methodology for advancing equity. Int J Equity Health. 2014 10;13(1):119. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4271465/pdf/12939_2014_Article_119.pdf Calman NS, Golub M, Ruddock C, Le L, Hauser D; Action Committee of the Bronx Health REACH Coalition. Separate and unequal care in New York City. J Health Care Law Policy. 2006;9(1):105-20. http://www.bronxhealthreach.org/wp-content/uploads/2011/06/Seperate_Uneaqual_Care_in_NewYorkCity.pdf.pdf Recommended: Trinh-Shevrin C, Kwon SC, Park R, Nadkarni SK, Islam NS. Moving the dial to advance population health equity in new york city asian american populations. Am J Public Health. 2015 Jul;105 Suppl 3:e16-25.
13. Dec 7	**Intersectoral Approaches to Urban Health: The Potential and Challenges**
	Libman K, Freudenberg N, Sanders D, Puoane T, Tsolekile L. The role of urban food policy in preventing diet-related non-communicable diseases in Cape Town and New York. Public Health. 2015 Apr;129(4):327-35. http://nycfoodpolicy.org/wp-content/uploads/2015/04/Libmanetal-The-Role-of-Urban-Food-Policy.pdf Kang E, Park HJ, Kim JE. Health impact assessment as a strategy for intersectoral collaboration. J Prev Med Public Health. 2011 Sep;44(5):201-9. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3249257/pdf/jpmph-44-201.pdf Spiegel J, Alegret M, Clair V, Pagliccia N, Martinez B, Bonet M, Yassi A.Intersectoral action for health at a municipal level in Cuba. Int J Public Health. 2012 Feb;57(1):15-23. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3282006/pdf/38_2011_Article_279.pdf Corburn J, Curl S, Arredondo G. A health-in-all-policies approach addresses many of Richmond, California's place-based hazards, stressors. Health Aff (Millwood). 2014 Nov;33(11):1905-13. On Bb. Pastor M, Morello-Frosch R. Integrating public health and community development to tackle neighborhood distress and promote well-being. Health Aff (Millwood). 2014;33(11):1890-6. http://escholarship.org/uc/item/81g1n5xk
	Digital Video : “Gen Silent” http://stumaddux.com/GEN_SILENT.html

14. Dec 14 Paper 4 due Delayed submissio n ⇨ INC	**Towards an Urban Health Agenda /Student Reports** Readings TBA
15. Dec 21	**Student reports**

Required Summer Reading for Cities, Society and Health

Please select one of the following books to read before classes begin on August 31st. Most are available on Amazon, at large book stores, online, by e-device and in some major libraries. Please bring the critical review to submit at the first session of class as a two page essay (typed, single spaced, 1" margins, 12 point font) that briefly summarizes and critiques the book and discusses how the book deepens your understanding of how city living affects health.

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Books (choose one)

Anderson, Elijah. The Cosmopolitan Canopy: Race and Civility in Everyday Life. Norton, 2012.
From Booklist. Cosmopolitan canopies are those spaces in urban environments that offer a break from the tensions of chafing racial and economic differences, a place for diverse peoples to assemble and rub elbows. Sociologist and folk ethnographer Anderson offers a rich narrative of such spaces in Philadelphia, including Reading Terminal Market and Rittenhouse Square. Anderson details the give-and-take of public interaction in urban settings, much of it dictated by race and class. He observes how close and far away people sit, whether they greet each other, how deep or long their interactions are, and whether they break or reinforce barriers. He also chronicles the daily shifting of space used by the homeless, workers, residents, and commuters as they encounter, interact, and evade. Anderson's observations are keen but not distant as he offers journal pages and interviews, showing his own full engagement in interactions with a cross section of Philadelphians.

Barber, Benjamin. If Mayors Ruled the World. Yale University Press, 2013.
Barber cites the unique qualities cities worldwide share: pragmatism, civic trust, participation, indifference to borders and sovereignty, and a democratic penchant for networking, creativity, innovation, and cooperation. He demonstrates how city mayors, singly and jointly, are responding to transnational problems more effectively than nation-states mired in ideological infighting and sovereign rivalries. Featuring profiles of a dozen mayors around the world—Barber makes a persuasive case that the city is democracy's best hope in a globalizing world, and great mayors are already proving that this is so.

Brash, Julian. Bloomberg's New York Class and Governance in the Luxury City. University of Georgia Press, 2011.
New York Mayor Michael Bloomberg claims to run the city like a business. In *Bloomberg's New York*, Julian Brash applies methods from anthropology, geography, and other social science disciplines to examine what that means. He describes the mayor's attitude toward governance as the Bloomberg Way—a philosophy that

holds up the mayor as CEO, government as a private corporation, desirable residents and businesses as customers and clients, and the city itself as a product to be branded and marketed as a luxury good.

Conn, Steven Americans Against the City: Anti-Urbanism in the Twentieth Century. Oxford University Press, 2014.
Conn explores the anti-urban impulse across the 20th century, examining how the ideas born of it have shaped both the places in which Americans live and work, and the anti-government politics so strong today. Beginning in the booming industrial cities of the Progressive era at the turn of the 20th century, where debate surrounding these questions first arose, Conn examines the progression of anti-urban movements.

Fainstein, Susan. The Just City. Cornell University Press, 2010. In this book, Susan Fainstein draws together her conceptual work over the past twenty years on the just city and her empirical work on urban development projects in major Western cities. Her commitment to social justice shines through this work, and she provides a challenging approach to evaluating urban development projects from this perspective. The result is a valuable contribution to planning theory and to the evaluation of urban policy.

Glaeser, Edward. Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier, 2011. From Booklist. Glaeser's academic specialty, urban economics, informs his survey of how cities around the world thrive and wither. Using a range of expository forms-- history, biography, economic research, and personal story—he defines what makes a city successful. That changes through time, and a flourishing Industrial Age model may not work in the service-age economy, as rust-belt towns like Detroit have learned. One thing constantly attracts people to one city rather than another: how much housing construction is permitted. Other features of metropolises--their incidences of poverty and crime, traffic congestion, quality of schools, and cultural amenities-- also figure in Glaeser's analysis. Whatever the city under discussion, Mumbai or Woodlands, Texas, Glaeser is discerning and independent; for example, he believes that historic preservation isn't an unalloyed good and that bigger, denser cities militate against global warming.

Katz, Bruce and Bradley, Jennifer. The Metropolitan Revolution: How Cities and Metros Are Fixing Our Broken Politics and Fragile Economy. Brookings, 2013. Across the US, cities and metropolitan areas are facing huge economic and competitive challenges that Washington won't, or can't, solve. The good news is that networks of metropolitan leaders – mayors, business and labor leaders, educators, and philanthropists – are stepping up and powering the nation forward. These state and local leaders are doing the hard work to grow more jobs and make their communities more prosperous, and they're investing in infrastructure, making manufacturing a priority, and equipping workers with the skills they need.

Landale, Nancy S. McHale, Susan, Booth, Allan. Authors & Editor. Growing Up Hispanic: Health and Development of Children of Immigrants. The Urban Institute, 2010. Hispanic children of immigrants are a diverse and fast-growing population in the United States. Growing Up Hispanic explores the challenging environment in which these children are raised--high poverty rates, low academic achievement, limited access to health and social services, negative sentiments about immigrant families, and uncertain political and legal support--and examines how neighborhood, family, school, and community affect their development and well-being. A bold policy agenda can improve these children's lives and help them thrive. Here, diverse scholars examine the social ecologies, how families influence children's adaptation to new environments, the effects of education policies on school experiences, and the roles of health care policies and social services in well-being.

Meleis, Afaf Ibrahim ; Birch, Eugenie L., Wachter, (Susan M. (Editors). Women's Health and the World's Cities University of Pennsylvania Press, 2013.. Growing urbanization affects women and men in fundamentally different ways, but the relationship between gender and city environments has been ignored or misunderstood. Women and men play different roles, frequent different public areas, and face different health risks. Women suffer disproportionately from disease, injury, and violence because their access to resources is often more limited than that of their male counterparts. Yet, when women are healthy and safe,

so are their families and communities. Urban policy makers and public health professionals need to understand how conditions in densely populated places can help or harm the well-being of women in order to serve this large segment of humanity.

Perlman, Janice. Favela: Four Decades of Living on the Edge in Rio de Janeiro. Oxford University Press, 2010.
An exhaustive study of life in the 1,020 favelas—squatter settlements in Rio de Janeiro—in this sequel to her 1976 book, *The Myth of Marginality*. Here she attempts to find and reinterview her subjects as well as their children and grandchildren. Her authoritative account based on interviews with almost 2,500 people (some of whom she has known for 40 years) blends detailed personal testimonies with ethnography and insightful analyses of the urbanization of poverty, the implications of public policy and the drug trade. Her measured approach is all the more compelling because as she investigates the deprivation and danger faced by favela dwellers—19% of the city's population—she also conveys a deep understanding that favelas are not merely despair-filled slums but communities, and many residents have remained there by choice. She is also insightful about the limitations of her own research and the conclusions that can be drawn from it, making her arguments all the more meaningful.

Sze, Julie. Noxious New York: The Racial Politics of Urban Health and Environmental Justice. MIT Pres, 2006. Racial minority and low-income communities often suffer disproportionate effects of urban environmental problems. Environmental justice advocates argue that these communities are on the front lines of environmental and health risks. In Noxious New York, Julie Sze analyzes the culture, politics, and history of environmental justice activism in New York City within the larger context of privatization, deregulation, and globalization. She tracks urban planning and environmental health activism in four gritty New York neighborhoods: Brooklyn's Sunset Park and Williamsburg sections, West Harlem, and the South Bronx

Russell, James S. The Agile City: Building Well-being and Wealth in an Era of Climate Change. Island Press.*The Agile City* engages the fundamental question: what to do about global warming? Journalist and urban analyst James S. Russell argues that we'll more quickly slow global warming-and blunt its effects-by retrofitting cities, suburbs, and towns. *The Agile City* shows that change undertaken at the building and community level can reach carbon-reduction goals rapidly. Intelligently designing our towns could reduce marathon commutes and child chauffeuring to a few miles or eliminate it entirely. Agility, Russell argues, also means learning to adapt to the effects of climate change, which means redesigning the obsolete ways real estate is financed; housing subsidies are distributed; transportation is provided; and water is obtained, distributed and disposed of. These engines of growth have become increasingly more dysfunctional both economically and environmentally. *The Agile City* highlights tactics that create multiplier effects, which means that ecologically driven change can shore-up economic opportunity, can make more productive workplaces, and can help revive neglected communities.

Saunders, Douglas. Arrival City, Pantheon. From Publishers Weekly. In a globe-trotting narrative alive with on-the-ground reportage, journalist Saunders offers a cautionary but essentially optimistic perspective on global urbanization. He concentrates on the slums and satellite communities that act as portals from villages to cities and, in turn, revitalize village economies. Policy makers misunderstand at their peril these "arrival cities"—London's heavily Bangladeshi Tower Hamlets, Brazil's favelas, China's Shenzhen. Citing the statistical relationship between urbanization and falling poverty rates, as well as historical precedents like Paris ("the first great arrival city of the modern world"), Saunders insists urban migration means improvement overall, and that the arrival city serves as a springboard for the integration of new populations. While the picture of urbanization veers from gloomier forecasts by analysts like Mike Davis (Planet of Slums), it does so by eschewing direct questioning of the global economic system driving much of this migration. Saunders's narrative, however, does plead for rational and humane planning within global capitalism to ensure that arrival cities fulfill their purpose and achieve their potential.

Verner, Dorte. Reducing Poverty, Protecting Livelihoods, and Building Assets in a Changing Climate: Social Implications of Climate Change for Latin America and the Caribbean. World Bank, 2010. Climate change is the defining development challenge of our time. More than a global environmental issue, climate change and variability threaten to reverse recent progress in poverty reduction and economic growth. Both now and over the long run, climate change and variability threatens human and social development by restricting the fulfillment of human potential and by disempowering people and communities in reducing their livelihoods options. Communities across Latin America and the Caribbean are already experiencing adverse consequences from climate change and variability.

Selected Readings on Health Impact Assessment

Bhatia R, Corburn J. Lessons from San Francisco: health impact assessments have advanced political conditions for improving population health. Health Aff (Millwood). 2011 Dec;30(12):2410-8.
Bourcier E, Charbonneau D, Cahill C, Dannenberg AL. An evaluation of health impact assessments in the United States, 2011-2014. Prev Chronic Dis. 2015 Feb 19;12:E23.
Coenen P, Gouttebarge V, van der Burght AS, van Dieën JH, Frings-Dresen MH,van der Beek AJ, Burdorf A. The effect of lifting during work on low back pain: a health impact assessment based on a meta-analysis. Occup Environ Med. 2014 Dec;71(12):871-7.
Collins J, Koplan JP. Health impact assessment: a step toward health in all policies. JAMA. 2009 Jul 15;302(3):315-7.
de Blasio A, Girán J, Nagy Z. Potentials of health impact assessment as a local health policy supporting tool. Perspect Public Health. 2012 Sep;132(5):216-20.
Fakhri A, Maleki M, Gohari M, Harris P. Investigating underlying principles to guide health impact assessment. Int J Health Policy Manag. 2014 May 21;3(1):17-22.
Fehr R, Hurley F, Mekel OC, Mackenbach JP. Quantitative health impact assessment: taking stock and moving forward. J Epidemiol Community Health. 2012 Dec;66(12):1088-91.
Gase LN, Kuo T, Dunet D, Schmidt SM, Simon PA, Fielding JE. Estimating the potential health impact and costs of implementing a local policy for food procurement to reduce the consumption of sodium in the county of Los Angeles. Am J Public Health. 2011 Aug;101(8):1501-7.
Haigh F, Baum F, Dannenberg AL, Harris MF, Harris-Roxas B, Keleher H, Kemp L, Morgan R, Chok HN, Spickett J, Harris E. The effectiveness of health impact assessment in influencing decision-making in Australia and New Zealand 2005-2009. BMC Public Health. 2013 Dec 17;13:1188.
Harris P, Sainsbury P, Kemp L. The fit between health impact assessment and public policy: practice meets theory. Soc Sci Med. 2014 May;108:46-53
Heller J, Givens ML, Yuen TK, Gould S, Jandu MB, Bourcier E, Choi T. Advancing efforts to achieve health equity: equity metrics for health impact assessment practice. Int J Environ Res Public Health. 2014 Oct 24;11(11):11054-64.
Hoehner CM, Rios J, Garmendia C, Baldwin S, Kelly CM, Knights DM, Lesorogol C, McClendon GG, Tranel M. Page Avenue health impact assessment: building on diverse partnerships and evidence to promote a healthy community. Health Place. 2012 Jan;18(1):85-95.
James P, Ito K, Banay RF, Buonocore JJ, Wood B, Arcaya MC. A health impact assessment of a proposed bill to decrease speed limits on local roads in Massachusetts (U.S.A.). Int J Environ Res Public Health. 2014 Oct 2;11(10):10269-91.
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Johnson Thornton RL, Greiner A, Fichtenberg CM, Feingold BJ, Ellen JM, Jennings JM. Achieving a healthy zoning policy in Baltimore: results of a health impact assessment of the TransForm Baltimore zoning code rewrite. Public Health Rep. 2013 Nov;128 Suppl 3:87-103.

Kang E, Park HJ, Kim JE. Health impact assessment as a strategy for intersectoral collaboration. J Prev Med Public Health. 2011 Sep;44(5):201-9.
Knutsson I, Linell A. Review article: health impact assessment developments in Sweden. Scand J Public Health. 2010 Mar;38(2):115-20.
Korfmacher KS, Aviles K, Cummings BJ, Daniell W, Erdmann J, Garrison V. Health impact assessment of urban waterway decisions. Int J Environ Res Public Health. 2014 Dec 25;12(1):300-21.
Lhachimi SK, Nusselder WJ, Boshuizen HC, Mackenbach JP. Standard tool for quantification in health impact assessment a review. Am J Prev Med. 2010 Jan;38(1):78-84.
Likhvar VN, Pascal M, Markakis K, Colette A, Hauglustaine D, Valari M, Klimont Z, Medina S, Kinney P. A multi-scale health impact assessment of air pollution over the 21st century. Sci Total Environ. 2015 May 1;514:439-49.
Liu HY, Bartonova A, Pascal M, Smolders R, Skjetne E, Dusinska M. Approaches to integrated monitoring for environmental health impact assessment. Environ Health. 2012 Nov 21;11:88.
MacNaughton G, Forman L. The value of mainstreaming human rights into health impact assessment. Int J Environ Res Public Health. 2014 Sep 26;11(10):10076-90.
McCartney G, Palmer S, Winterbottom J, Jones R, Kendall R, Booker D. A health impact assessment of the 2014 Commonwealth Games in Glasgow. Public Health. 2010 Aug;124(8):444-51.
Mindell J, Bowen C, Herriot N, Findlay G, Atkinson S. Institutionalizing health impact assessment in London as a public health tool for increasing synergy between policies in other areas. Public Health. 2010 Feb;124(2):107-14.
Mueller N, Rojas-Rueda D, Cole-Hunter T, de Nazelle A, Dons E, Gerike R, Götschi T, Int Panis L, Kahlmeier S, Nieuwenhuijsen M. Health impact assessment of active transportation: A systematic review. Prev Med. 2015 Jul;76:103-114.
Pennington A, Dreaves H, Scott-Samuel A, Haigh F, Harrison A, Verma A, Pope D. Development of an Urban Health Impact Assessment methodology: indicating the health equity impacts of urban policies. Eur J Public Health. 2015 Jul 9. pii:ckv114.
Pertschuk M, Pomeranz JL, Aoki JR, Larkin MA, Paloma M. Assessing the impact of federal and state preemption in public health: a framework for decision makers. J Public Health Manag Pract. 2013 May-Jun;19(3):213-9.
Pollack KM, Givens ML, Tung GJ. Using health impact assessments to advance the field of injury and violence prevention. Inj Prev. 2014 Apr;20(2):145-6.
Povall SL, Haigh FA, Abrahams D, Scott-Samuel A. Health equity impact assessment. Health Promot Int. 2014 Dec;29(4):621-33.
Rajotte BR, Ross CL, Ekechi CO, Cadet VN. Health in All Policies: addressing the legal and policy foundations of Health Impact Assessment. J Law Med Ethics. 2011 Mar;39 Suppl 1:27-9.
Richardson MJ, English P, Rudolph L. A health impact assessment of California's proposed cap-and- trade regulations. Am J Public Health. 2012 Sep;102(9):e52-8.
Saint-Pierre L, Lamarre MC, Simos J. [Health Impact Assessments (HIA): an intersectoral process for action on the social, economic and environmental determinants of health]. Glob Health Promot. 2014 Mar;21(1 Suppl):7-14

Smith KE, Fooks G, Collin J, Weishaar H, Gilmore AB. Is the increasing policy use of Impact Assessment in Europe likely to undermine efforts to achieve healthy public policy? J Epidemiol Community Health. 2010 Jun;64(6):478-87.
Ullmann SH. The health impacts of international migration on Mexican women. Glob Public Health. 2012;7(9):946-60.
Vohra S, Cave B, Viliani F, Harris-Roxas BF, Bhatia R. New international consensus on health impact assessment. Lancet. 2010 Oct 30;376(9751):1464-5.
Wendel AM. Establishing the practice of health impact assessment in the United States. J Environ Health. 2012 Jul-Aug;75(1):32-3.
Yuen TK, Payne-Sturges DC. Using health impact assessment to integrate environmental justice into federal environmental regulatory analysis. New Solut. 2013;23(3):439-66.

Academic integrity

The Graduate Center regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the CUNY Policy on Academic Integrity and other sourcesfor definitions and examples of academic dishonesty.

DPH HPM SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

The Graduate Center
PUBH 805: Quantitative Research Methods with Applications to Urban Public Health
28952
Fall 2015
3 credits

"Nullius in verba" ("On the word of no one")
-Motto of the Royal Society

"Well, first came an action, and then a reaction
But you can't switch 'em 'round for your own satisfaction
Well, you burnt my house down, then got mad at my reaction."
-The White Stripes, *Effect and Cause*

Catalogue description	This course will introduce students to quantitative research methods in urban public health. It follows introductory biostatistics and epidemiology courses. Course objectives include understanding the fundamentals of causality and study design. We will learn about the assumptions and interpretation of linear and logistic regression, experiments and quasi-experiments, and complex surveys and questionnaire design. Topics subsumed in these areas include dummy variables, instrumental variables, interaction terms (effect modification), fixed effects, and weighting and stratification. The focus will be on interpretation and critique of methods in health services research.
Course meets	Wednesday, 6:30-8:30 pm, Graduate Center 6495
Instructor	Alexis Pozen, Ph.D.
Email	alexis.pozen@sph.cuny.edu
Phone	646-664-8361
Office	55 W 125th St, 8th Floor
Office hours	By appointment
Required materials	Readings are available [online] through the CUNY library and will be posted on Blackboard.
Recommended books	Woolridge, JM. Introductory econometrics: a modern approach. 5th edition. Cengage, 2012. Angrist JD, Pischke, J-S. Mostly harmless econometrics: an empiricist's companion. 1st edition, Princeton University Press, 2009.

Course Policies

Grading

		Dates
10%	Problem Set 1	10/7
10%	Problem Set 2	10/28
10%	Problem Set 3	11/18
10%	Problem Set 4	12/9
25%	Midterm – in class	10/21
25%	Final (non-cumulative) – in class	12/9
10%	Class participation	
100%		

Assignments and exams
Problem sets will be graded out of 10 points each (10 percent of your grade each) and will be a mix of quantitative problems and literature critiques. You may work together with others in the class, but answers must be your own. Exams will be in class and will each count for 25 points each (25 percent of your grade each). They will be closed book. The final will *not* be cumulative.

Attendance and class participation
As class discussion will be key to learning in this course, attendance is required. Please notify me at least one week in advance if you will not be able to attend class. Your meaningful participation will contribute not only to your own understanding of the material, but to others' as well. Please come to class having done readings and ready to ask and answer questions.

Late submission of assignments
Late assignments will be marked down a half letter grade (or 5 percentage points) for every day late.

Class citizenship & rules of conduct
Please come to class on time, and let me know in advance if you need to come late or leave early. I don't mind if you use laptops in class, but please limit use to note-taking to avoid distracting others. Remember to turn off your cell phones.

Email correspondence
Feel free to email me any time at alexis.pozen@sph.cuny.edu with any questions or concerns about the course, related material, the program, research, etc., and I will get back to you as soon as possible. Remember, office hours are by appointment, and I encourage meetings!

Institutional policies

Accessibility
Special accommodations for students with disabilities are available through the campus disability services offices. Please contact them, and they will inform me of the appropriate accommodations to make. More information about campus disability services is available here: http://www.cuny.edu/about/administration/offices/sa/services/disabilities/student-info.html

Academic integrity

"The Graduate Center of the City University of New York is committed to the highest standards of academic honesty. Acts of academic dishonesty include—but are not limited to—plagiarism (in drafts, outlines, and examinations, as well as final papers), cheating, bribery, academic fraud, sabotage of research materials, the sale of academic papers, and the falsification of records. An individual who engages in these or related activities or who knowingly aids another who engages in them is acting in an academically dishonest manner and will be subject to disciplinary action in accordance with the bylaws and procedures of the Graduate Center and of the Board of Trustees of the City University of New York.

"Each member of the academic community is expected to give full, fair, and formal credit to any and all sources that have contributed to the formulation of ideas, methods, interpretations, and findings. The absence of such formal credit is an affirmation representing that the work is fully the writer's. The term "sources" includes, but is not limited to, published or unpublished materials, lectures and lecture notes, computer programs, mathematical and other symbolic formulations, course papers, examinations, theses, dissertations, and comments offered in class or informal discussions, and includes electronic media. The representation that such work of another person is the writer's own is plagiarism.

"Care must be taken to document the source of any ideas or arguments. If the actual words of a source are used, they must appear within quotation marks. In cases that are unclear, it is the responsibility of the writer to take due care to avoid plagiarism.

"The source should be cited whenever:

(a) a text is quoted verbatim

(b) data gathered by another are presented in diagrams or tables

(c) the results of a study done by another are used

(d) the work or intellectual effort of another is paraphrased by the writer

"Because the intent to deceive is not a necessary element in plagiarism, careful note taking and record keeping are essential in order to avoid unintentional plagiarism."

Source: CUNY Graduate Center Student Handbook, 2014-15, Available at: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf

Academic dishonesty will be treated on a case-by-case basis. Penalties may include imposing a failing grade on the assignment, imposing a failing grade in the course, or termination from the program.

Last day to drop the course with the grade of "W"

See the CUNY academic calendar for the date this semester.

Grade of incomplete

It is my policy to not give a grade of incomplete. You are expected to complete all assignments on time, with exception of grave emergency, as noted above under assignments.

SCHEDULE

Session	Date	Topic	Readings and Assignments
1	9/2	Intro to quantitative methods -Course logistics -All about causality! -Types of data, types of studies	Glass, TA, et al. Causal inference in public health. Annual Review of Public Health 2013; 34: 61-75.
2	9/9	Research design -Causality -Experiments -Natural and quasi-experiments -Internal and external validity -Econometric fixes	Manning WG, Newhouse WP, Duan N, et al. Health insurance and the demand for medical care: evidence from a randomized experiment. The American Economic Review 1987; 77: 251-277.
3	9/16	Ordinary least squares (OLS) regression, bivariate -Assumptions and properties -Regression equation – all the ways you can possibly say "regressor" -How to choose variables to put into a regression -Interpreting coefficients -When to choose OLS -Modeling non-linear relationships with OLS	*Problem set 1 distributed* Fletcher JM, McLaughlin SM. Neighborhood factors during adolescence: modest effects on cardiovascular risk, small impact on obesity and depression. Health Affairs 2015; 34(9): 1472-79.
4	9/23	NO CLASS	
5	9/30	Ordinary least squares (OLS) regression, multivariate -Multiple regression versus bivariate regression (versus RCT) -How to choose variables to put into a regression; how to choose what to leave out -Omitted variable bias multicollinearity -R-squared, adjusted R-squared	Roebuck MC, Dougherty JS, Kaestner R, Miller LM. Increased use of prescription drugs reduces medical costs in Medicaid populations. Health Affairs 2015; 34(9): 1586-93.

6	10/7	Hypothesis Testing -Type I and II errors, false negatives and positives, sensitivity and specificity -T-test, confidence intervals, p-values -F-test -Significance and power	*Problem set 1 due* *Problem set 2 distributed* Very short: SPRINT Study press release, September 11, 2005. http://www.nhlbi.nih.gov/news/press-releases/2015/landmark-nih-study-shows-intensive-blood-pressure-management-may-save-lives
7	10/14	Functional Form -Log, quadratic, interaction terms -Rescaled variables Midterm review	Hunt KJ, Alanis MC, Johnson ER, et al. Maternal pre-pregnancy weight and gestational weight gain and their association with birthweight with a focus on racial differences. Maternal and Child Health Journal 2013; 17(1): 85-94.
8	10/21	MIDTERM – IN CLASS	
9	10/28	Midterm debrief Dummy variables -Ordinal variables Measurement error -Independent variable versus dependent variable measurement error Heteroskedasticity	*Problem set 2 due* *Problem set 3 distributed* Hart JE, Liao X, Hong B, et al. The association of long-term exposure of $PM_{2.5}$ on all-cause mortality in the Nurses' Health Study and the impact of measurement error correction. Environmental Health 2015; 14: 38-46
10	11/4	Qualitative dependent variables -Linear probability model -Logit -Probit	Chen J, Fang H, Rizzo JA. Physician-patient language concordance and malpractice concerns. Medical Care 2011; 49: 1040-44.

11	11/11	Quasi-experiments 1 -Differences-in-differences -Fixed and random effects (hierarchical modeling)	Levine PB, Trainor AB, Zimmerman DJ. The effect of Medicaid abortion funding restrictions on abortions, pregnancies and births. Journal of Health Economics 1996; 15(5): 555-578.
12	11/18	Quasi-experiments 2 -Instrumental variables -Regression discontinuity (if time) -Matching/propensity scores	*Problem set 3 due* *Problem set 4 distributed* Anderson ML, Matsa DA. Are restaurants really supersizing America? American Economic Journal: Applied Economics 2011; 3: 152-188. Long S, Dahlen H. Expanding coverage to low-income childless adults in Massachusetts: implications for national health reform. Health Services Research 2014; 49(S2): 2129-46.
13	11/25	Complex surveys -Questionnaire design -Sampling -Weighting and stratification	
14	12/2	Meta-analyses and systematic reviews Final exam review	
15	12/9	FINAL EXAM (non-cumulative) – IN CLASS	*Problem set 4 due*

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 807 Practicum Project
3 Credits
Fall 2015

Time and location	This course will not meet.
Instructor	Daliah Heller, PhD MPH daliah.heller@sph.cuny.edu
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	The DPH Practicum Project is a planned, supervised and evaluated experience that allows students to apply the knowledge and skills that they have acquired through learning experiences in a practice setting. The DPH Practicum Project requires 180 practicum hours that can be completed in a range of organizations across New York City or elsewhere. Students must document how the 180 practicum hours are spent. The student must complete a detailed learning plan, a summary report (that includes objectives), a self-evaluation, and a final report.
Course prerequisites	PUBH 800, PUBH 801
Course format	The pedagogical component of this course will be administered online, including all assignments. The student will meet individually with the Course Instructor at least twice during the semester (Practicum Project period).
Required reading and resources	N.a.
Suggested reading and resources	N.a.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify, develop, evaluate and recommend policy and programmatic interventions to improve population health at individual, community, government and country levels based on empirical evidence of social, political, cultural, biological, economic, historical, behavioral, environmental, and global factors in health and disease.	Apply public health knowledge and skills to design, implement monitor, and assess health-related interventions.	• Learning Plan • Progress Report • Final Report
Assess the mechanisms and pathways by which factors influence individual and population health.		
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues.	Demonstrate the application of cross-disciplinary methods, theories, and data in public health practice.	• Final Report
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	Present and discuss public health research and practice in diverse settings and audiences.	• Final Report • Project-related products • Self-reflection paper
Demonstrate leadership skills to facilitate the goals of population health research and practice.		
Design and deliver innovative educational experiences that promote learning about population health in academic and practice-based settings	Apply public health research and practice innovation to a wide array of settings and situations	• Learning Plan
Implement professional and organizational ethical guidelines in population health research and practice.	Thoroughly articulate and address ethical issues in public health research and practice.	• Self-reflection paper

Secure resources to conduct population health research and practice	Identify sources of funding and material support for public health research and practice.	• Self-reflection paper

Course Assessments

Over the course of the semester, the student is required to submit four assessments: a detailed Learning Plan, a Progress Report, a Final Report, and a Self-Evaluation paper. Though not graded, the Project Preceptor must also complete and submit a Student Evaluation Report at the end of the Project.

Grading

Evaluation criteria

Student progress in the Practicum will be measured with the documents submitted over the course of the semester. A rubric is posted with each Assignment on the Blackboard course website, detailing the measures by which it will be assessed.

The relative weight of each course component is as follows:

Assessment	Weight
Learning Plan	15%
Progress Report	10%
Final Report	60%
Preceptor Evaluation	Not graded
Self-Evaluation	15%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

The final course grade will be determined using the performance assessment described above, and resulting in a Pass (70% or higher) or a Fail (less than 70%) grade.

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course.

Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

While the program discourages students from taking Incompletes, under some circumstances, an Incomplete may be the only option for completing the Practicum Project. **A request for an Incomplete must be approved by the Course Instructor, and the incomplete grade must be resolved by the end of the subsequent semester.**

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

No class will be given for this course. Students must submit Assignments to the course Blackboard site by the deadline posted. Students will be required to meet with the Course Instructor at least twice during the semester.

Late/incomplete submission of assignments

Late assignments will not be accepted unless approved by the Course Instructor, and with sufficient documentation describing the reason for lateness.

Make-ups, rewrites, and extra credit

No make-ups, rewrites, or assignments for extra credit will be offered.

Expectations of students

Students are expected to submit Assignments on time, to participate respectfully on the course Blackboard website, and to communicate with the Course Instructor on progress and problems related to the Practicum Project, as soon as issues arise.

Expectations for the instructor

The Course Instructor will grade Assignments and post results within five days of submission. The Course Instructor will respond to all emails from students within 48 hours of receipt, and will arrange face-to-face meetings with students as requested, and with Preceptors, as necessary.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

This course schedule is subject to change.

For important dates in the semester process, please refer to the current academic calendar.

Session	Date	Topic	Assignment
1	August 31	Introduction and review of Practicum Project expectations	ONLINE PARTICIPATION: Students must log on to the Blackboard course, and on the Discussion topic provided, create a new thread introducing themselves and providing a 2-3 sentence description of their Practicum Project. Students must comment on at least one other student's posting. **DUE: By September 6**
2	August 31 thru September 10	Individual meeting with Course Instructor	IN-PERSON MEETING: Schedule and meet with Course Instructor to review Practicum Project work-plan and discuss detailed Learning Plan.
3	September 10	Learning Plan assignment	ASSIGNMENT SUBMISSION: **DUE: By September 14** Prepare a detailed Learning Plan for your Practicum Project, and submit to Blackboard
4	October 5	Progress Report assignment	ASSIGNMENT SUBMISSION: **DUE: By October 14** Prepare a progress report on your Practicum Project work to date, and submit to Blackboard and to your Practicum Sponsor.
5	November 30 thru December 12	Individual meeting with Course Instructor	IN-PERSON MEETING: Schedule and meet with Course Instructor to review Practicum Project progress and discuss plans for Final Report.

6	December 14	Final Report assignment	ASSIGNMENT SUBMISSION: **DUE: By December 14** Submit a comprehensive final report on your Practicum Project, demonstrating how the Project objectives were achieved. Submit via Blackboard, and include any attachments produced for the Project.
7	December 14	Practicum Sponsor evaluation of student	EVALUATION SUBMISSION (not graded): **DUE: By December 18** Practicum Sponsor must email a completed, co-signed evaluation form to Course Instructor. *Student should also upload the completed evaluation form to the Final Report submission on Blackboard.
8	December 14	Self-evaluation	ASSIGNMENT SUBMISSION: **DUE: By December 21** Via Blackboard, submit a final self-evaluation of your work on the Practicum Project.

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CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 811: Social and Behavioral Dimensions of Health: Theory and Methods
3 Credits
Fall 2015

Time and location	Graduate Center, Room 3207 Thursdays, 6:30-8:30
Instructor	Betty Wolder Levin, PhD Professor, Health and Nutrition Sciences, Brooklyn College Public Health, Graduate Center CSH, CUNY School of Public Brooklyn College: (718) 951-5000, x2744 DPH Program Office: (212) 817-7986 BWLevin@Brooklyn.cuny.edu e-mail is the best way to reach me Please put PUBH 811 at the beginning of the subject line
Office hours	Brooklyn College, Tuesdays, 4:30 to 6:00, 4111 Ingersoll Hall Graduate Center, Thursdays, 4:30 to 6:00, 3317 DPH Office You are encouraged to set up appointments for longer meetings
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course prepares students to understand the impact of social structures and social environments on health and health behavior. Using an interdisciplinary approach, the course examines the contributions of sociology, anthropology, economics, psychology, history and political science to the study of health and health behavior.
Course prerequisites	A strong background in Public Health and Socials Science and plans to do research using social science theory and methods is advised.
Course format	The course will primarily be conducted as a seminar with presentations and engaged discussion among the instructor, students and guest speakers
Required and suggested readings and resources	All required and most recommended readings will be posted on Blackboard. See list below

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Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Draw on social science and behavioral theories to analyze the impact of class, race, ethnicity, gender, disability and sexual orientation on the health of individuals and communities	Apply concepts, theories, data and methods from the social and behavioral sciences to critically analyze health issues at multiple levels of analysis. Compare and contrast multiple perspectives social factors such as class, race, ethnicity, gender, disability and sexual orientation and their implications for the study of the health	Discussion and writing assignments (especially week 2 and the term paper). Discussion and writing assignments (especially weeks 3-5)
Assess community needs, assets and capacity to promote health	Employ social science theories and methods to assess community needs, assets and capacities	Discussions and writing assignments (especially weeks 6-7)
Apply quantitative and qualitative or, when appropriate, mixed methods to community health research and evaluation	Compare and contrast the contributions of quantitative, qualitative, and mixed methods to the study of public health issues	Discussions and writing assignments (especially weeks 3, 8, and13-15)
Investigate through multidisciplinary methods the potential implications and impact of policies and politics in health, education, justice, housing, welfare, child and family services and other sectors on individual and community health	Utilize research drawn from multiple social science disciplines to analyze the effects of policies and politics in multiple sections on individual and population health.	Discussion and writing assignments, (especially weeks 8-9)
Develop and teach educational curricula on community health using theories and methods from the social sciences and public health disciplines		Serving as a resource person and weeks 13-14.

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Course Assessments

Students' understanding of the course material will be evaluated through class participation, discussion posts, group work, a reflection paper, and a term paper.

Description of Assignments and Grade Calculation

1. **Class Participation and posts to the discussion board (25 points):** Students are expected to have read assigned reading before each class and be active participants in all sessions.

   Students will post comments, questions, and thoughts related to the readings / class / topic on the discussion board for at least six weeks of the semester. Discussion posts much be submitted by 9 PM the night before class to count toward the six weeks of required posts. In addition to the required posts, you are encouraged to post responses to other students posts, or make additional comments on topics after class discussion or later in the semester.

2. **Group Work (10 points):** Each student will sign up for two classes for which he/she will be a member of a "**resource group**" (one with and one without a guest speaker). The members of the resource group will work together to raise questions and lead critical class discussion on assigned readings and present additional material for further though.

   Presentations *should not* just summarize the required readings. Groups may describe material in optional readings or additional material from other classes, your work, case examples, or other material from the scholarly or gray literature. For classes without guest speakers, formal presentations by *all* group members together should be relatively short (e.g., 15 – 30 minutes) and are intended to generate discussion. You *may* use power points or other audio-visuals, but you do not have to do so. For weeks with guest speakers, there are no formal presentations by group members. Both during the weeks with and without guest speakers, resource group members are expected to add additional thoughts and generate additional questions during class discussions.

3. **Reflection Papers (15 points):** Each student will write a 3-6 page paper. The reflection paper should critically discuss the applicability of ideas from the course readings, as well as other sources, on a topic that is different from your term paper topic. The papers may expand on a discussion post or class discussion. It should be presented a short, scholarly paper and demonstrate your ability to use a standard citation style such at the AAA, AMA (APHA) or APA format.

4. **Term Paper (50 points):** The purpose of the term paper is to give each student the opportunity to conduct an in-depth examination of the application of social theory and concepts to a public health problem of interest. For example, a term

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paper could analyze ways in which different conceptualizations of race and ethnicity are used in the research literature on obesity, or compare different disciplinary approaches or different level of analysis for the understanding of disparities in rates of a diseases in different populations, or could discuss differences in the framing of a public health problem by different stakeholders..

Term papers are expected to be at least 15 pages (3,750 words) including references. In preparation, students will submit a proposed topic description early in the semester, and a proposal (including an abstract, a detailed outline and an annotated bibliography) later on. These first two submissions will not be graded. Based on these materials, students will prepare a first submission of the term paper, which will be graded. Based on comments from the instructor and further analysis, students will submit a final version of the term paper. The term paper should have a one page executive summary or abstract.

a. **Topic paper (2-3 pages): Sept. 17th**
b. **Paper proposal (abstract, outline and references): Oct. 22nd**
c. **1st version of term paper (25 pts): Nov. 25 (on Blackboard)**
d. **Final version of term paper (25 pts): December 17th**

We will workshop the papers briefly in class during the semester and students will also briefly present their work and we will further workshop papers on Dec. 3rd and 10th between the first and final draft. You are encouraged to meet with the instructor to discuss your papers and share your work with other students in order to help you develop your ideas during the course of the semester.

Requirements for Written Assignments**:**
All papers must be typed, double-spaced, spell-checked and proofread. Please follow a standard scholarly citation format used for public health articles for citing references, such as one used for the publications of the APHA, AMA or APA (see their journals' "instructions for authors"). A useful website with information on scholarly writing styles is the OWL website from Purdue University::
<http://owl.english.purdue.edu/owl/resource/560/01/>

Please submit hard and electronic copies of all assignments through Blackboard unless otherwise noted. All assignments must be submitted on the respective due dates.

Grading

Evaluation criteria
Students will be evaluated based on the quality (rather than the quantity) of their contributions to discussion posts and on class discussions to demonstrate understanding of social science and public health concepts and issues. Written assignments will be judged both on the ability to demonstrate understanding and utilize social science and public health theory and methods to contribute to the understanding

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of public health problems, as well as the ability to present ideas in a scholarly manner (appropriate use of citations, writing style, etc.).

The relative weight of each course component is as follows:

Assessment	Weight
Class participation and discussion posts	25%
Class presentations and group work	10%
Reflection paper	15%
Term paper	50%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

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Course Policies

Attendance and class participation
Students are expected to attend class regularly; you must be present to participate in class so excessive absences will result in a lower grade for class participation. You are responsible for material that you missed if you are absent; it is your responsibility to obtain class notes from another student, not the instructor.

Late/incomplete submission of assignments
Late submission of work may result in a lower grade; initial discussion posts much be posted by 9 PM the night before class to receive credit.

Make-ups, rewrites, and extra credit
Students will submit an initial draft of the term paper by Nov. 25th; students will be able to rewrite the term paper after receiving comments from the professor and members of the class. Students who receive a grade below B may re-write their reflection paper. There are no opportunities for extra credit assignments.

Enrollment in Blackboard
Blackboard will be used on a routine basis as a learning tool and to facilitate communication with both the instructor and classmates. Assigned readings will be posted on blackboard; some additional readings will also be posted. Please use an e-mail address that you check often for Blackboard.

Expectations of students
Please turn off cell phones and do not check e-mail, messages or other electronic media during class except for emergency situations. Computer use during class is only acceptable if it is directly linked to the current class discussion (e.g., finding data or a citation to contribute to a class discussion).

Expectations for the instructor
Students can expect the instructor to give clear descriptions of expectations for assignments; please ask questions if you are unsure of what to do! Student can also expect the instructor to try to return material promptly. Efforts will be made to return written work within one week and answer e-mails within two days.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

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Course Schedule

The following schedule lists expected dates for topics and readings; however, it is subject to change throughout the semester. Additional reading will likely be posted and the dates of sessions may change. Not all readings are required.

Please check the Blackboard site during the week before class to see if there are changes in topic as well as required and recommended readings. Changes will also be sent to the e-mail associated with your Blackboard site. Please check those sources regularly. Major changes will be noted on a revised syllabus, posted on Blackboard (check date in header).

Schedule of classes and assignments

1. 8/27 Introduction to the course
2. 9/3 Introduction to the Use of Social Theory in Public Health

   9/10 NO THURSDAY CLASSES
3. 9/17 Gender – Biological and Social Perspectives
   Guest speaker: Dr. Spring Cooper

   Term Paper Topic Due
4. 9/24 Race and Ethnicity
5. 10/1 Class and Intersectionality
6. 10/8 Health Promotion: Individual Behavioral Focus

   Reflection Paper Due
7. 10/15 Health Promotion: Group and Policy Focus

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8.	10/22	Bioethics, Social Justice and Human Rights Perspectives: "Guest speaker": Betty Wolder Levin, PhD **Term Paper Proposal Due**
9.	10/29	Political Science Perspectives Guest Speaker: Jane Levitt, PhD
10.	11/5	Sociological Perspectives Guest Speaker: Barbara Katz Rothman, PhD
11.	11/12	Anthropological Perspectives Guest Speaker: Anahi Viladrich, PhD
12.	11/19	Preliminary Workshopping of term papers
	11/25	**First Draft of Term Paper Due on Blackboard**
	11/26	NO CLASS – THANKSGIVING
13.	12/3	**Student Presentations/Workshopping of Term Papers**
14.	12/10	**Student Presentations/Workshopping of Term Papers**
15.	12/17	Last Class – Final Thoughts and Celebration **Final Draft of Term Paper Due**

Readings

INTRODUCTION TO THE USE OF SOCIAL THEORY IN PUBLIC HEALTH

Edberg, M. Social/behavioral theory and it roots, In Edberg M. *Essentials of Health Behavior: Social and Behavioral Theory in Public Health.* Sudbury, MA: Jones and Bartlett; 2007, Chapter 3, 24-34. (If new version is available, I will post that.)

National Cancer Institute. *Theory at a Glance: A Guide for Health Promotion Practice* (2nd edition). Bethesda: National Institutes of Health, 2005. Available at: http://www.cancer.gov/PDF/481f5d53-63df-41bc-bfaf-5aa48ee1da4d/TAAG3.pdf

Krieger N. Theories for social epideiology for the 21st century: an ecosocial perspective. *International Journal of Epidemiology* 2001; 30:668-667.

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Bradbury-Jones, C, Taylor J, Herbert O. How theory is used and articulated in qualitative research: Development of a new typology. *Social Science & Medicine* 120; 2014: 135-141.

Look at these and read at least one

Potvin L, Gendron S, Bilodeau A, Chabot P. Integrating social theory into public health practice. *American Journal of Public Health.* 2005;95(4):591-595.

Garoon JP, Duggan, PS. 2008. Discourses of disease, discourses of disadvantage: A critical analysis. *Social Science and Medicine*, 2008; 67:1133-1142.

Zierler S, Krieger N. Reframing women's risk: Social inequalities and HIV infection. *Ann Rev Public Health* 1997;18:401-36.

GENDER – BIOLOGICAL AND SOIAL PERSPECTIVES

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National Public. Radio. Paige's Story. Invisibilia. Broadcast February 05, 2015 11:48 PM E Available at: http://www.npr.org/player/v2/mediaPlayer.html?action=1&t=1&islist=false&id=384104070&m=384134300 Accessed Sept. 2, 2015.

Optional:

Springer KW, Stellman JM, Jordan-Young RM. Beyond a catalogue of differences: A theoretical frame and good practice guidelines for researching sex/gender in human health. *Social Science & Medicine* 74 (2012) 1817-1824.

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RACE AND ETHNICITY – HEALTH DISPARITIES AND OTHER ISSUES

National Public Radio A Physician Asks: Is Being Black Bad For Your Health? Code Switch: Frontiers in Race, Culture and Ethnicity. 2015.. Available at: http://www.npr.org/sections/codeswitch/2015/09/09/438823854/a-physician-asks-is-being-black-bad-for-your-health Accessed on Sept. 10, 2015.

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Sen M., Wasow O. Race as a 'Bundle of Sticks': Designs that estimate effects of seemingly immutable characteristics, *Annual Review of Political Science*, Forthcoming 2016;19. Copy at http://j.mp/17OEdTX

Green TL, Darity WA. Under the skin: Using theories from biology and the social sciences to explore the mechanism behind the Black-White health gap. *American Journal of Public Health:* 2010;100(S1):S36-40.

Optional

Diez Roux AV. Conceptual approaches to the study of health disparities. *Annual Review of Public Health 2012; 33,* 41-58.

Dressler WW, Oths KS, Gravlee CC. Race and ethnicity in public health: Models to explain health disparities. *Annual Review of Anthropology*. 2005;34::231-252.

Ford CL, Airhihenbuwa CO. The public health critical race methodology: Praxis for antiracism research. *Social Science and Medicine* 2010;71:1390-1398.

Adler NE, Rehkopf DH. U.S. disparities in health: Descriptions, causes, and mechanisms. *Annual Review of Public Health.* 2008; 29:235–52.

Macintosh P. White privilege: Unpacking the invisible knapsack. Accessed Sept. 15, 2015.(1988): Available at: http://www.nymbp.org/reference/WhitePrivilege.pdf.

INTERSECTIONALITY AND CLASS

Crenshaw K. Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*. 1991:43(6):1241-1299.

Schulz AJ, Mullings L, eds. *Gender, Race, Class, and Health: Intersectional Approaches*. San Francisco, CA: Jossey-Bass, 2006. Selected chapters.

Hankivsky O. Women's health, men's health, and gender and health: Implications of intersectionality. *Social Science & Medicine*, 2012; 74:1712-1720.

Smith KE, Schrecker T (eds). Special Issue: Theorising health inequalities. *Social Theory and Health, 2015;13(3-4).*

MODELS OF HEALTH BEHAVIOR AND BEHAVIOR CHANGE

Edberg M. *Essentials of Health Behavior: Social and Behavioral Theory in Public Health*, 2nd ed. Sudbury, MA: Jones and Bartlett, 2015. Chapters 4–7.

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Glanz K. Bishop K. The role of behavioral science theory in development and implementation of health interventions. *Annual Review of Public Health, 2010; 31:399-418.*

Glanz K. Rimer BK, Viswanath K. . (2015). Health Behavior: Theory, Research and Practice. San Francisco, CA: Jossey-Bass. 2015. (selected chapters including 2, 4 and 5).

Glanz K, Bishop K. The role of behavioral science theory in development and implementation of health interventions. *Annual Review of Public Health.* 2010; 31:399-418.

Wallerstein N, Duran B. Community-based participatory research contributions to intervention research: The intersection of science and practice to improve health equity. *American Journal of Public Health*. 2010;100(S1):S40-46.

BIOETHICS, SOCIAL JUSTICE AND HUMAN RIGHTS

Thomas JC (2009). Public health ethics. Chap. 7 in Scutchfield FW. Keck CW. *Principles of Public Health Practice*: Clifton Park, NY : Delmar Cengage Learning.

Public Health Leadership Society. Principles of the Ethical Practice of Public Health, 2002. Retrieved March 15, 2009 from:http://www.apha.org/NR/rdonlyres/1CED3CEA-287E-4185-9CBD-BD405FC60856/0/ethicsbrochure.pdf

Look at this collection of modules

Jennings B, Kahn J, Mastronianni A, Parker L .*Ethics and Public Health: Model Curriculum.* 2003. Downloaded Aug. 15, 2013 from <https://repository.library.georgetown.edu/bitstream/handle/ 10822/556779/se0583.pdf?sequence=1>

Read at least one of the following

Gruskin S, Mills EJ, Tarantola D. History, principles, and practice of health and human rights. *The Lancet*, 2007; 370(9585): 449-455.

Levin BW and Schiller NG. Social class and medical decision making: A neglected topic in bioethics. *Cambridge Quarterly of Healthcare Ethics*, 1998; 7:41-56.

POLITICAL SCIENCE PERSPECTIVES ON PUBLIC HEALTH

Bellah R, Madsen R, Sullivan MW, Swidler A. Tipton SM. Introduction to the updated edition: The House Divided. *In: Habits of the Heart: Individualism and Commitment in American Life.* Berkeley: University of California Press; 1985, 199

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Gostin, LO, Powers M. What does social justice require for the public's health. Public Health ethics and policy imperatives; social justice demands more than fair distribution of resources in extreme public health emergencies. *Health Affairs,* 2006;25(4): 1053-1060.

Bellah, Richard, et.al. Introduction in *Habits of the Heart: Individualism and Commitment in American Life*. Berkeley, CA:University of California Press, 1985, 1996.

Gostin L. Public Health in the Constitutional Design. Chapter 2 in *Public Health Law: Power, Duty and Restraint.* Berkeley, CA: University of California Press. 2008.

Oliver, "The Politics of Public Health Policy*", Annual Review of Public Health* 2006;27(1):195-233.

Bodenheimer T. The political divide in health care: A liberal perspective. *Health Affairs.* 2005;24(6):1426-1435.

Lantz PM, Richare L, Lichtenstein RL, Pollack HA. Health policy approaches to population health: the limits of medicalization. Lack of access to health care is not the fundamental cause of health vulnerability or social disparities in health. *Health Affairs.* 2007;26(5):1253-1257.

Raphael D. Public policies and the problematic USA population health profile. *Health Policy.* 2007; 84:101-111.

Smedley BD. Moving beyond access: Achieving equity in state health care reform. *Health Affairs*. 2008;27(2):447-455.

SOCIOLOGICAL PERSPECTIVES

Please look at Dr. Barbara Katz Rothman's website <www.BarbaraKatzRothman.com> and read some of the material that interests you as well as the article listed below.

Rothman, BK. Midwifery skills: On expertise and craft. *Essentially MIDIRS*, 2013;4(2):17-23. Accessed: October 17, 2013 from <https://docs.google.com/file/d/0B5cvFH0n3yAudGdjZU5sZlVSZ00/edit>

ANTHROPOLOGICAL PERSPECTIVES

Viladrich A**.** Medical tourism in tango paradise: The internet branding of cosmetic surgery in Argentina. *Social Science and Medicine* 2014. 45:116-131.

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Viladrich A. Beyond welfare reform: Reframing undocumented immigrants' entitlement to health care in the United States, a critical review. *Social Science and Medicine*. 2012; 74(6):822-829.

Viladrich A. Botanicas in America's backyard: Uncovering the world of Latino healers' herb healing practices in New York City. *Human Organization* 2006; 65(4):407-419.

Special Dates

Sept. 2nd: Last day to register for a fall course
Sept. 16th Last day to add or drop a course without a "W" on transcript
Nov. 9th Last day for an unevaluated withdrawal "W" from a course

Last Updated 11/8/16

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 814 - Food Politics and Policy
3 Credits
Fall 2015

Time and location	Thursdays 6:05 PM – 7:50 PM and online Silberman 216 and online August 27, 2015 – December 23, 2015
Instructor	Nevin Cohen, Ph.D. Associate Professor, CUNY School of Public Health 55 West 125th Street, room 811 New York, NY 10027 212-646-8340 (T) 917-721-8037 (M) nevin.cohen@sph.cuny.edu (preferred contact)
Office hours	Wednesdays 3:00 to 6:00 or by appointment
Course website	https://canvas.instructure.com/courses/957342
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This is a policy course that examines the effects of the food industry and government on diet-related disease, and on health promotion and disease prevention. Most readings have a strong political content. Central themes include: government action versus individual liberty, the contradictions of government support and opposition to certain policies, the role of litigation, and the importance of institutions (e.g., bureaucracy, Congress, the media).
Course prerequisites	30 completed credits + advisor + instructor permission
Course format	This is a hybrid course that meets in person 5 times during the semester; the remainder of the time the course is conducted online asynchronously through Canvas.
Required reading and resources	All readings listed in the course schedule will be available in PDF format on the course website. You may wish to have your own copy of the following texts, but that is optional: Neff, Roni, ed. *Introduction to the US Food System: Public Health, Environment, and Equity*. John Wiley & Sons, 2014. Wilde, Parke. *Food policy in the United States: An introduction*. Routledge, 2013.
Suggested reading and resources	A list of additional readings and resources will be posted to the course website.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
Identify, develop, evaluate and recommend policy and programmatic interventions to improve population health at individual, community, government and country levels based on empirical evidence of social, political, cultural, biological, economic, historical, behavioral, environmental, and global factors in health and disease.	- Conduct research on food policy and health - Critically discuss the food policy literature - Analyze food policies and write policy briefs offering evidence-based recommendations	-Discussion forum -Reading reflections -Policy briefs
Assess the mechanisms and pathways by which factors influence individual and population health.	-Analyze food policies through social and behavioral frameworks -Identify opportunities for policy interventions to influence nutrition and diet-related chronic diseases	-Discussion forum -Policy briefs
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues.	-Understand the effects of federal, state, and local policies on the food system, including the availability of healthy food -Assess the effects of policies on dietary choices, food practices, and health outcomes	-Discussion forum -Reading reflections -Policy briefs

Course Assessments

Discussion Fora: We will engage in two online discussions each week, beginning the second week of class. One will involve debating a current policy controversy addressed in the week's readings. The second will involve identifying and discussing policy innovations to address the week's topic. You will be expected to contribute information, insights, evidence-based argumentation, and reflect and respond to the ideas expressed by others. I will evaluate your contributions based on how well you integrate the readings and other published material into your comments, the logic of your arguments, how adequately you back up statements with evidence, and writing quality.

In-class Discussions: Since we meet in person only five times during the semester it is essential for you to attend these classes. Our in-class discussions will follow the same format as our online discussions, but because the conversations are in real time you must be prepared in real time to address the readings scheduled for that week. You will be evaluated on the quality of your engagement with colleagues.

Policy Briefs: You will prepare two 5-page policy briefs addressing a current food policy issue that affects the urban food environment. These can be evaluations of proposed policies, recommendations for new policies, or an analysis that sheds new light on existing policies and programs. These will be evaluated based on the quality of the evidence used to support your argument(s), the logic of the arguments, the analysis you provide, and the quality of the writing (including grammar, proper citations, etc.)

Grading

Evaluation criteria

Students who perform exceptionally in all aspects of the course will receive an "A." A grade of "B" will reflect adequate work. Any grade below a "B" will indicate that you should be performing better. All assignments must meet professional standards of analysis, presentation, and timeliness. Accurate spelling and grammar, and clear and concise writing, are critical. Assignments *will not be accepted after they are due* unless you have a compelling reason for being late (e.g., medical or family emergencies) and I agree to an alternative due date.

Evaluation criteria for written assignments:

A	The assignment is well-written, accurate, original, relevant, and teaches us something new. It adds substantial learning presence to the course and stimulates additional thought about the issue under discussion.
B	The assignment lacks at least one of the required qualities, but is generally above average in quality. It makes significant contribution to our understanding of the issue being discussed.
C	The assignment lacks two or more of the required qualities listed above. Comments are based on unsubstantiated personal opinion.
D	The assignment presents little or no new information.
F	The assignment adds no value to the discussion and lacks many of the required qualities.

The relative weight of each course component is:

	Weight
Discussion Forum – Policy Debate	20%
Discussion Forum – Policy Innovation	20%
In-class discussions	10%
Policy Brief #1	25%
Policy Brief #2	25%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

You are required to attend every class that meets in person and to participate in every online discussion session. This is particularly important as we meet only once per week. As noted above, I expect active participation in both in-person and online discussions.

Late/incomplete submission of assignments

Late or incomplete assignments will not be accepted unless you are ill or have a family emergency. If you know you will not be able to meet a deadline contact me as soon as possible to discuss an alternate deadline.

Make-ups, rewrites, and extra credit

There are no make-ups for the online discussions. You will have an opportunity to re-write the two policy briefs based on my comments, and I will count only the final grade. There are no extra credit assignments.

Expectations of students

One of the biggest obstacles to successful learning is not allocating sufficient time to coursework. I realize that many of you are juggling multiple responsibilities, but I expect you to devote the effort required to read assigned material and learn the course content and to put effort into the online discussions and the policy briefs. I also expect you to be the consummate professionals that you are – showing respect and treating each other collegially in both in-person and online interactions. In your discussions with me, please be open and communicative – please tell me if the course is not meeting your expectations early on so that I can make adjustments. Whatever you do, please let me know if you are having trouble with any aspect of the course. Other expectations include the following:

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and the academic calendar.
- Know how to use library resources and citation tools.
- Come to class and to the Canvas site fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date unless due to a medical or family emergency.
- No credit for assignments suspected of plagiarism. (and see the Academic Integrity section below for the additional consequences of plagiarism)
- Regularly check the course website and official university email for course correspondence. The readings and schedule are likely to change, and it is your responsibility to keep track of the schedule.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted on the discussion board.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

My goal is to make this course a valuable learning experience that is intellectually interesting and challenging and relevant to your professional and academic work. You can expect me to be prepared each week, to make myself as accessible as possible, to return your work promptly (usually within one week) with comments and suggestions, and to treat each of you with respect and collegiality. I have high expectations and strict standards, but I also try to be very reasonable if you express concerns or problems to me as they arise (and not at the end of the term). Specifically, I will try to:

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours Monday through Friday.
- Communicate about grades and progress in the course through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Last Updated 11/8/16

Course Schedule

This schedule is likely to change as the semester progresses. Please check the course website for updates, and ask if you are unsure about scheduled topics/readings or assignments. Also refer to the current academic calendar for important university-wide dates.

Session	Date	Topic	Readings/Resources	Assessment
I. Introduction to Food Politics and Policy				
1	8/27/15 In Person	Course Overview: The problems with our food system are well-known: food insecurity, ubiquity of unhealthy food, occupational hazards in the food industry, environmental damage, etc. This course explores the reasons why the food system has evolved the way it has, and the potential for public policy – at both the national and local levels -- to re-shape it to improve health, social justice and ecological well-being. In this first class we will introduce ourselves, review our expectations for the course, go over logistics, including the features of the online learning platform, and then discuss what we mean by a food *system*, and how looking at food as a system helps us to understand its multidimensionality and interconnectedness, which will lead to better policymaking.	Neff, Chapter 1 – Food systems -This introductory chapter of Neff's edited volume briefly discusses systems thinking and the elements of the food system. It also discusses the concept of "wicked problems," a framework very helpful in thinking about many different public health problems. Shannon KL, Kim BF, McKenzie SE, Lawrence RS. Food System Policy, Public Health, and Human Rights in the United States. *Annu Rev Public Health*. 2015;36(1):151-173. -This review article explains how policies structure the food system, and the consequences for health, a topic that we'll address in more depth throughout the semester.	-In-class discussions
2	9/3/15 In Person	Drivers of the food system - economics, policies, lobbyists, marketing: In this session we'll examine the different forces that shape food policies and thus the food system.	Neff, Chapters 7, 8, 10 -These chapters provide an overview of basic economic concepts that are important for understanding food policy; food policy development; and the role of marketing in both food economics and policy – as well as individual behavior. Wilde, Chapter 1 - This chapter reviews basic civics as it applies to food and also discusses the	-Discussion fora

			role of interest groups in shaping food policy Nestle, Chapter 4 -Nestle explains in more detail the role of industry lobbyists in shaping food policies. Moreland, Chapter 2 - This chapter by Professor Spark provides an overview of federal food policy and the structure of the food industry	
3	9/17/15 Online	Urban food policy: Many food advocates have argued that local governments may be better able to intervene in the food system through local policies and innovative programs. This class reviews why there has been a turn to the local and what local governments can do to affect a global socio-technical system like food.	- Morgan K. Nourishing the city: The rise of the urban food question in the Global North. Urban Stud. 2014. Kevin Morgan explains why food has become an urban issue and how cities have begun to address the consequences of the dominant food system. - Cohen N. Urban food systems strategies. Elgar Companion To Sustain Cities Strateg Methods Outlook . 2014:57-85. In this chapter I outline a number of ways in which cities in the US have begun to re-shape the food system through policies. - Libman K, Freudenberg N, Sanders D, Puoane T, Tsolekile L. The role of urban food policy in preventing diet-related non-communicable diseases in Cape Town and New York. Public Health. 2015;129(4):327-335. Kim Libman and colleagues discuss urban policies specifically addressing diet-related diseases. - Freudenberg N, Atkinson S. Getting food policy on the Mayoral table: a comparison of two election cycles in New York and London. *Public Health*. 2015;129(4):295-302. The question of the salience of food policy at the local level is critical. This article discusses how food gets on the political agenda. -Reeve B, Ashe M, Farias R, Gostin L. State and Municipal Innovations in Obesity Policy: Why Localities Remain a Necessary Laboratory for Innovation. *Am J Public Health*. 2015;105(3):442-450. One argument for focusing on urban policies is that cities are more nimble	-Discussion fora

			scales in which to develop, test, and improve food policies, as this article discusses.	
II. Reducing Food Insecurity				
4	9/24/15 Online	Federal food assistance programs: In the next several sessions we tackle the complex, interrelated issues of food insecurity, malnourishment, and poverty, and the various policies aimed at improving access to healthy food and improving nutrition and health.	- Neff, chapters 5 & 6 These chapters discuss ways to measure food insecurity and community food security, and various policies to make people and communities more food secure. - Pringle, chapter 6 This chapter provides a brief overview of the history of food stamps/SNAP and WIC. Read it before the Aussenberg report. - Aussenberg, RA & Colello, KJ. Domestic Food Assistance: Summary of Programs. Congressional Research Service. 2/4/15. This report summarizes the federal food assistance programs - Mercier S. Review of U. S. Nutrition Assistance Policy : Programs and Issues. 2012;(June) The Mercier report also reviews federal food assistance policies and programs, providing more detail and evidence of their effects. You can skim this report and refer back to it as a reference. - Fricke HE, Hughes a. G, Schober DJ, et al. An Examination of Organizational and Statewide Needs to Increase Supplemental Nutrition Assistance Program (SNAP) Participation. *J Hunger Environ Nutr*. 2015;10(2):271-283. - Dimitri C, Oberholtzer L, Nischan M. Reducing the Geographic and Financial Barriers to Food Access: Perceived Benefits of Farmers' Markets and Monetary Incentives. *J Hunger Environ Nutr*. 2013;8(4):429-444. These final two articles discuss local policy responses to the SNAP program – increasing participation in the program and increasing the use of SNAP for fresh fruits and vegetables sold through farmers markets.	-Discussion fora
5	10/1/15 In Person	School food and nutrition programs for children: School food is critical because it provides a large portion of the daily calories of many children, and the school food program is a	- Poppendieck, J. 2010. Free For All: Fixing School Food in America. Berkeley: UC Press. Chapters 2&3, pgs 46-110. Professor Poppendieck's chapters discuss the genesis and evolution of the school food program	-Discussion fora

		huge public food procurement program that can potentially be used to support regional food producers, change production methods, and improve public health.	- Wilde, Chapter 11 Wilde's chapter also discusses the Women Infants and Children (WIC) program. - Aussenberg, A. School Meals Programs and other USDA Child Nutrition Programs: A Primer. 2014. Congressional Research Service. Skim this and use it as a reference. Dinour LM. Conflict and Compromise in Public Health Policy: Analysis of Changes Made to Five Competitive Food Legislative Proposals Prior to Adoption. *Heal Educ Behav*. 2015;42(1 Suppl):76S - 86S. This article discusses the policy processes involved in addressing so-called competitive foods – vending machine snacks and other food sold during the school day. It's useful in understanding the kinds of political forces that move policy initiatives forward and inhibit them.	
6	10/8/15 Online	Improving the built food environment Policy Brief 1 Due	- Neff, Chapters 13, 14, and 17 These chapters explain how the food processing and distribution industries evolved to the concentrated, centralized system that we have today, and how this system affects local food environments. - Stanton R a. Food Retailers and Obesity. *Curr Obes Rep*. 2015;4:54-59. doi:10.1007/s13679-014-0137-4. The Stanton article explains how the economics and design of the modern supermarket contributes to obesity. - Lehmann et al. State-Level Interventions: Pennsylvania's Fresh Food Financing Initiative. In Morland Ch. 9 This chapter discusses an increasingly common policy approach to improve food access in low-income communities: financing and other incentives to get supermarket chains to open. - Libman K. Has New York City fallen into the local trap? *Public Health*. 2015;129(4):310-317. Libman's article questions whether a focus on local food environments detracts from a potentially more important focus on citywide interventions that would improve the food environment more broadly. - Elbel B, Moran A, Dixon LB, et al. Assessment of a government-subsidized	-Discussion fora -Policy Brief

			supermarket in a high-need area on household food availability and children's dietary intakes. *Public Health Nutr*. 2015:1-10. Elbel's recent study in the South Bronx calls into question the effectiveness of supermarket incentive programs in low-income communities. -Leib EM. All (Food) Politics is Local : Increasing Food Access through Local Government Action. *Harvard Law Policy Rev*. 2013;7:321. Leib's article summarizes a wide range of local policy interventions to improve food access. -Sacks R, Yi SS, Nonas C. Increasing Access to Fruits and Vegetables: Perspectives From the New York City Experience. *Am J Public Health*. 2015:e1-e9. This article reviews numerous NYC policies to increase access to fresh fruits and vegetables.	
III. Improving Nutrition and Food Quality				
7	10/15/15 Online	Obesity: One of the most politically salient food system issues over the past decade has been obesity and resulting NCDs. Many policies already examined in the course are designed to reduce obesity, but in this class we'll dive more deeply into how obesity has been defined, its role in shaping policy, and specific policy efforts to address it.	-Sisnowski J, Handsley E, Street JM. Regulatory approaches to obesity prevention: A systematic overview of current laws addressing diet-related risk factors in the European Union and the United States. *Health Policy (New York)*. 2015;119(6):720-731. This article discusses who is targeted for policy interventions and what categories of policies are used in the EU and US to reduce obesity. -Bowen DJ, Barrington WE, Beresford S a. a. Identifying the Effects of Environmental and Policy Change Interventions on Healthy Eating. *Annu Rev Public Health*. 2015;36(1):289-306. doi:10.1146/annurev-publhealth-032013-182516. -Kersh R, Elbel B. PUBLIC POLICY & OBESITY: OVERVIEW AND UPDATE. *Wake For J Law Policy*. 2015;5:105-123. Kersh and Elbel discuss different types of policies that operate through different behavioral mechanisms at different scales to address obesity. -Berg, Chapter 5 Berg's chapter focuses on anti-obesity policies and politics during the Bloomberg administration in NYC.	-Discussion fora

8	10/22/15 Online	Dietary guidelines and nutritional standards	-Wilde Chapters 8 & 9 These chapters discuss the evolution of federal dietary guidelines and the regulation (or non-regulation) of nutritional labeling and nutritional claims. - Nestle Chapters 1-3 This section from Nestle's book explores the politics of dietary advice in the US. -Lederer A, Curtis CJ, Silver LD, Angell SY. Toward a healthier city: nutrition standards for New York City government. *Am J Prev Med*. 2014;46(4):423-428. -Tsui EK, Wurwarg J, Poppendieck J, Deutsch J, Freudenberg N. Institutional food as a lever for improving health in cities: the case of New York City. *Public Health*. 2015;129(4):303-309. These two articles discuss how NYC has used nutritional standards for the food it serves or controls to improve public health.	-Discussion fora
9	10/29/15 In Person	Food and beverage marketing and calorie labeling:	-Neff, Chapter 10 This chapter provides an overview of food and beverage marketing -Cheyne A, Mejia P, Nixon L, Dorfman L. Food and Beverage Marketing to Youth. *Curr Obes Rep*. 2014;3:440-450. This article specifically addresses food marketing to youth, particularly in communities of color. -Gregory, Christian A., Ilya Rahkovsky, and Tobenna D. Anekwe. *Consumers' Use of Nutrition Information When Eating Out,* EIB-127, U.S. Department of Agriculture, Economic Research Service, June 2014. -Rendell SL, Swencionis C. Point-of-Purchase Calorie Labeling Has Little Influence on Calories Ordered Regardless of Body Mass Index. *Curr Obes Rep*. 2014;3:368-375. The USDA report and the subsequent article discuss one type of informational regulation - the use of calorie labeling - to encourage consumers to reduce their calorie consumption.	-Discussion fora
10	11/5/15 Online	Food Safety: Food illnesses are a significant public health problem. This session reviews the food safety regulatory system and recent changes to make it more effective.	CRS – Primer and guidance for 114th congress	-Discussion fora

IV. Supporting Healthy Food Systems				
11	11/12/15 Online	Sustainable and Resilient Diets: The public health field has recently begun to focus on the relationship between our diets and global sustainability. The nexus between food and climate change, the water consumption of food production, and food waste have become particularly salient issues. This session discusses the notion of a sustainable diet, and how food policies might foster ecological sustainability.	-Neff Chapter 3 This chapter provides an overview of the relationship between food systems and the environment. -Scientific Report of the 2015 Dietary Guidelines Advisory Committee Part D. Chapter 5: Food Sustainability and Safety This year, for the first time, the US Dietary Guidelines were informed by an analysis of sustainability, as this chapter in the scientific report supporting the dietary guidelines discusses. -Berry EM, Dernini S, Burlingame B, Meybeck a, Conforti P. Food security and sustainability: can one exist without the other? *Public Heal Nutr*. 2015;(5):1-10. -Drewnowski A. Healthy diets for a healthy planet. *Am J Clin Nutr*. 2014;99(353410):1284-1285. -Lang T, Barling D. Nutrition and sustainability: an emerging food policy discourse. *Proc Nutr Soc*. 2013;72(1):1-12. These articles discuss the importance and value of integrating sustainability into our dietary policies and into the field of nutrition.	-Discussion fora
12	11/19/15 Online	Organic, local, healthy: Consumers tend to conflate these concepts, and in this class we will tease them out and learn whether, how and to what extent organic production methods or localized food systems contribute to (or detract from) environmental or occupational health, sound nutrition, and food security.	- Obach, Brian K. Organic Struggle: The Movement for Sustainable Agriculture in the United States. MIT Press, 2015. Chapters 3, 4, 5, 8 Obach's book discusses the history of the organic food movement and the creation of federal organic standards, an important context for discussing the role of organic food in health and sustainability. -Werkheiser I, Noll S. From Food Justice to a Tool of the Status Quo: Three Sub-movements Within Local Food. *J Agric Environ Ethics*. 2013. - Cleveland D a., Carruth A, Mazaroli DN. Operationalizing local food: goals, actions, and indicators for alternative food systems. *Agric Human Values*. 2014;32(2):281-297. - Born B, Purcell M. Avoiding the Local Trap: Scale and Food Systems in Planning Research. *J Plan Educ Res*. 2006;26(2):195-207. -Sonnino R. Escaping the Local Trap: Insights on Re-localization from School	-Discussion fora

			Food Reform. *J Environ Policy Plan*. 2010;12(1):23-40. These articles provide different perspectives on local food: the politics of local; the goals of local food systems; the trap we fall into when we embrace local; and the potential benefits of localizing food purchases.	
13	12/3/15 In Person	Guest Lecture TBA Policy Brief 2 Due	!	-Discussion fora -Policy Brief
14	12/10/15	Labor in the Food System: Food workers, from farm laborers to fast food restaurant staff to grocery deliverymen, face occupational hazards, low pay, exploitation, and limited potential for advancement. This final seminar session addresses the relationship between food labor and the current food system, the health risks to food workers, and opportunities to organize food laborers for better conditions.	- Myers JS, Sbicca J. Bridging good food and good jobs: From secession to confrontation within alternative food movement politics. *Geoforum*. This articles looks at the potential for alternative food movements to address labor issues. - Minkler M, Salvatore AL, Chang C, et al. Wage theft as a neglected public health problem: an overview and case study from San Francisco's Chinatown District. *Am J Public Health*. 2014;104(6):1010-1020. This article frame wage theft (and poverty wages) as a public health problem for food workers. -Bradie, Marnie. An Appetite for Justice: The Restaurant Opportunities Center of New York. In Milkman, R and Ott, E. New Labor in New York: Precarious Workers and the Future of the Labor Movement. This chapter describes ROC-NY, a new form of labor organization that has been organizing food workers for better wages and working conditions.	-Discussion fora
15	12/17/15	Course wrap-up		

Last Updated September 2, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 816: Evaluation of Public Health Programs and Policies
3 Credits (2 hours)
Fall 2015

Time and location	Tuesday, 4:15-6:15pm Graduate Center, Room 7314
Instructor	Nicholas A. Grosskopf, EdD, MCHES Associate Professor, York College and The Graduate Center Telephone: 718.262.5117 (Office @ York) 718.262.2053 (*Urban*Health Lab @ York) Email: ngrosskopf@gc.cuny.edu (the best way to reach me)
Office hours	On the York College Campus: • Monday, 12:30-2:30pm (HP-208) • Tuesday, by appointment • Wednesday, 4:30-5:30pm (Office Hours held in the *Urban*Health Lab [AC-3E07A]) • Thursday, by appointment Other times by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Prepares students to design evaluations of public health programs and policies; uses systems approach to identify key constituencies and tasks in evaluation; students design an evaluation of an existing program or policy.
Course prerequisites	While no current prerequisites exist, many students find it helpful to have taken a course in program planning/intervention development (e.g., PUBH 810).
Course format	This course uses a systems approach to research and evaluation. Thus major evaluation questions are: 1) How are program or policy goals defined; 2) By and for whom, and 3) What resources and feedback mechanisms are necessary to guarantee understanding, attainment of desired goals and further inquiry. This course emphasizes the validity of inference (that is, drawing reasonable conclusions) from data and the social consequences of making correct and incorrect inferences in research. The course prepares students to plan evaluation studies by providing a grounding in research design. Finally, the same standards are applied to the course as would be to any program to be evaluated—thus, the class will spend some time defining who the "client or consumer" for this

	course is, and ensuring "client or consumer" satisfaction. This is a "hands on," "how to" course that combines overviews of issues and techniques with exposure to excellent examples and practice. The course format uses an integrative approach. Class sessions will consist of lectures, small group seminars, case study activities, small group activities, guest speakers, etc.
Required reading and resources	Required Text: Rossi, P.H., Lipsey, M.W. & Freeman, H.E. (2004). *Evaluation: A systematic approach* (7th Edition). Thousand Oaks, CA: Sage.
Suggested reading and resources	**Recommended Reading**: ***Approaches to Evaluation and Evaluation Design*** Cook, T.D. & Campbell, D.T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Boston: Houghton Mifflin. Herman, J.L., Morris, L.L., & Fitz-Gibbon, C.T. (1987). *Evaluator's handbook*. Newbury Park, CA: Sage. Shadish, W.R., Cook, T.D., & Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Boston: Houghton Mifflin. Weiss, C.H. (1998). *Evaluation: methods for studying programs and policies* (2nd Edition). Upper Saddle River, NJ: Prentice Hall. ***Sampling*** Kish, L. (2000). Sampling. *Encyclopedia of psychology, Vol. 7* (pp. 139-142). Washington, DC: American Psychological Association. Kish, L. (1965). *Survey sampling*. Oxford England: Wiley. ***Measurement*** Robinson, J., Shaver, P., & Wrightsman, L. (1991). *Measures of personality and social psychological attitudes*. San Diego, CA US: Academic Press. ***Analytic Plans and Interpretation of Data*** Excerpts from: Fuguitt, D., & Wilcox, S. (1999). *Cost-benefit analysis for public sector decision makers*. Westport, Conn.: Econolit. SUNY Downstate's Pyramid of Evidence. http://library.downstate.edu/EBM2/2100.htm.

Other Resources:

Bryman, A., & Burgess, R. G. (1994). *Analyzing qualitative data*. London: Routledge.
Fitz-Gibbon, C. T., & Morris, L. L. (1987). *How to analyze data*. Newbury Park, CA: Sage.
Fitz-Gibbon, C. T., & Morris, L. L. (1987). *How to design a program evaluation*. Newbury Park, CA: Sage.
Henderson, M. E., Morris, L. L., & Fitz-Gibbon, C. T. (1987). *How to measure attitudes*. Newbury Park, CA: Sage.
King, J. A., Morris, L. L., & Fitz-Gibbon, C. T. (1987). *How to assess program implementation*. Newbury Park, CA: Sage.
Mohr, L. B. (1992). *Impact analysis for program evaluation*. Newbury Park, CA: Sage.
Morris, L. L., Fitz-Gibbon, C. T., & Lindheim. (1987). *How to measure performance and use tests*. Newbury Park, CA: Sage.
Patton, M. Q. (1987). *How to use qualitative methods in evaluation*. Newbury Park, CA: Sage.
Stecher, B. M., & Davis, W. A. (1987). *How to focus an evaluation*. Newbury Park, CA: Sage.
Udinsky, B.F., Osterline, S. J., & Lynch, S. W. (1981). *Evaluation resource handbook: Gathering, analyzing, reporting data*. San Diego: EdITS Publishers.

*A number of the above publications emanate from the Center for the Study of Evaluation at UCLA. University of Arizona also has a strong evaluation department.

Recommended Journals (Core Journals in Evaluation):

Evaluation and Program Planning
American Journal of Evaluation
Advances in Program Evaluation
Canadian Journal of Program Evaluation
Educational Evaluation and Policy Analysis
Evaluation Review
Evaluation and the Health Professions
American Journal of Public Health
Evaluation in Education and Human Services
Evaluation Journal of Australasia
Journal of Personnel Evaluation in Education
Evaluation Exchange
Journal of Multidisciplinary Evaluation
MandE (Monitoring and Evaluation) News
New Directions for Evaluation
Studies in Educational Evaluation

	Practical Assessment, Research and Evaluation (PARE) Journal of Empirical Research on Human Research Ethics **Recommended Websites**: American Evaluation Association (AEA): www.eval.org CDC Evaluation Working Group: www.cdc.gov/eval Heckathorn's Respondent-Driven Sampling (RDS) Resources: www.respondentdrivensampling.org The Community Toolbox: http://ctb.ku.edu/en American Statistical Association: www.amstat.org American Education Research Association (AERA): www.aera.net CUNY's approved Human Research Protection Program Training (CITI): www.cititraning.org HHS Office for Human Research Protections (OHRP): www.hhs.gov/ohrp Western Michigan University's Evaluation Center: http://www.wmich.edu/evaluation

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Draw on social science and behavioral theories to analyze the impact of class, race, ethnicity, gender, disability and sexual orientation on the health of individuals and communities	• Describe methods for engaging key constituencies in planning, implementing and presenting findings of evaluation studies	• Response Paper #1 • Critical Discussion Leader
2. Assess community needs, assets and capacity to promote health	• Design and implement systematic evaluations of various types of public health interventions including programs and policies	• Evaluation Plan • Evaluation Outcomes
3. Apply quantitative and qualitative or, when appropriate, mixed methods to community health research and evaluation	• Design and implement systematic evaluations of various types of public health interventions including programs and policies	• Weekly Participation • Integrated Evaluation Report • Critical Discussion Leader • Response Paper #2
4. Investigate through multidisciplinary methods the potential implications and impact of policies and politics in health, education, justice, housing, welfare, child and family services and other sectors on individual and community health	• Identify common methodological, organizational and logistic obstacles to effective evaluation and describe strategies for overcoming these obstacles • Develop strategies for finding resources needed for evaluation of public health programs and policies •	• Weekly Participation • Response Paper #1 • Integrated Evaluation Report
5. Develop and teach educational curricula on community health using theories and methods from the social sciences and public health disciplines	• Design and implement systematic evaluations of various types of public health interventions	• Response Paper #3

	including programs and policies	

Course Assessments

Participation & Professionalism: Your participation in class activities and discussions is expected throughout the semester. Class sessions will consist mainly of interactive discussions, team activities, guest speakers and the occasional lecture. Your instructor has the perspective that all classes are essentially intercultural encounters, among people in the class, between the reader and the author, and that we are all learning how to learn from one another.

Participation & Professionalism is worth **10%**.

Critical Discussion (Seminar) Leader: Each student will be required to lead a minimum of two critical discussions on supplemental articles/papers during at least two class sessions (30-45 minutes each). Seminar Leaders should post 3-5 critical discussion questions to our Blackboard Discussion Board Forum at least 3 days before the scheduled class sessions for peer review. Students may work in teams at the discretion of the instructor.

The Critical Discussion (Seminar) Leader Assignment (total) is worth **20%**.

Response Papers: Over the course of the semester we will be reading about and discussing different aspects of the evaluation and research process. Students will be required to develop several short papers (2-4 pages) in response to common questions, problems and dilemmas encountered in the field. These areas will include: 1) Ethics in Evaluation (including CITI Certificate); 2) Differing Perspectives on the Role of Evaluation; and 3) Analyzing and Critiquing Evaluation Reports.

The Response Papers (total) are worth **15%**.

Evaluation Plan, Outcomes & Integrated Report: Following the steps of the Herman et al. handbook and CDC recommendations/guidelines, each student will execute a professional level evaluation plan and description of outcomes (2 parts) using an existing health program or policy rooted in one of the focus areas of the NYC "Take Care" 2016 Preliminary Plan (http://www.nyc.gov/html/doh/html/about/tcny.shtml). *It is strongly recommended that students choose a program/policy with which they are not closely involved*. The evaluation plan will be written prospectively (such as a grant proposal) while the description of outcomes will be written retrospectively (such as a published article). At the conclusion of the course, students will be required to submit one integrated evaluation report, which combines elements of both documents and would be appropriate for dissemination to stakeholders (more below).

Students will demonstrate a "systems" and systematic approach by explicating program/policy theory, uncovering program questions, identifying stakeholders for the problem solution and, therefore, for the evaluation; focus on the problem that has the highest health implications and is amenable to change (most important and most changeable); select design, sampling, data collection, and measurement techniques

likely to lead to an interpretable and meaningful result; incorporate likely competing hypotheses in the design and measurement plan; create an analytic plan for the data; draw conclusions and make recommendations likely to improve the program or policy and the health of those it serves; include a logic model for the program/policy and evaluation; and have a recommendation for sustainability of effects if effects are found.

Each component of the plan and description of outcomes will be constructed and submitted for instructor feedback sequentially over the course of the semester. At the end of the semester each student will submit a completed evaluation report (culmination of all written components, including conclusions and recommendations), similar to what may be submitted by a professional evaluation consultant to a host agency/organization (15-20 pages). Students will also give a brief (10-15 minute) oral presentation of their completed plan (tailoring the dissemination to a specific group of stakeholders). The page lengths listed next to each component are recommendations. **Refer to each assignment's rubric for a detailed description of criteria (the criteria listed below are just a summary).**

The Evaluation Plan, Outcomes & Integrated Report (total) is worth **55%**.

Evaluation Plan Components (written prospectively) ***(20%)***:

1. Background (3-4 pages) **(5%)**
    a. Description of the Public Health Problem
    b. Identification of the Host/Sponsoring Agency or Organization
    c. Description & Rationale of the Program/Policy
    d. Program/Policy Logic Model & Timeline
2. Description of the Planned Evaluation (4-5 pages) **(15%)**
    a. Purpose(s) of the Evaluation
    b. Proposed Engagement of Stakeholders
    c. Proposed Evaluation Design
    d. Proposed Data Analysis Plan
    e. Proposed Evaluation Budget

*Evaluation Outcome Components (written retrospectively) (****15%****)*:

1. Identification and Description of Key Results or Findings (hypothetical (2-3 pages) **(5%)**
2. Discussion of Key Results/Findings, Conclusions & Recommendations (5-7 pages) **(10%)**

*Integrated Evaluation Report Components (written retrospectively) (15-20 pages total, excluding appendices) (****20%****):*

I. Abstract/Executive Summary
II. Background Information about the Program/Policy
III. Description of the Evaluation

IV. Evaluation Results/Findings
V. Discussion of Results/Findings
VI. Conclusions & Recommendations
VII. Appendices
    a. Program/Policy Staffing
    b. Program/Policy Timeline
    c. Evaluation Measures (instrumentation, protocols, etc.)
    d. Evaluation Matrix/Flowchart (evaluation questions, program/policy objectives, measures, data collection techniques, data utilization, etc.)
    e. Program/Policy Activities/Initiatives/Materials
    f. Evaluation Budget
    g. Program Logic Model

Grading

Evaluation criteria

Most assignments will be evaluated using holistic grading rubrics that will be posted to our Blackboard course site. Students are encouraged to use the criteria on the rubrics in helping construct their assignments (e.g., headings/sections, sub-sections, etc.).

The relative weight of each course component is as follows:

Assessment	Weight
Participation & Professionalism	10%
Critical Discussion Leader	20%
Evaluation Plan Component #1: Background	5%
Evaluation Plan Component #1: Description	15%
Evaluation Outcomes Component #1: Results/Findings	5%
Evaluation Outcomes Component #2: Discussion, Conclusions & Recommendations	10%
Response Paper #1	5%
Response Paper #2	5%
Response Paper #3	5%
Integrated Evaluation Report	20%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78

C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Students are expected to attend class regularly and participate. Because this is a "hands on" course, class participation is a very important part of the learning process in this course. Although not explicitly graded, you will be evaluated on the QUALITY of your contributions and insights. Quality comments possess one or more of the following properties:

- Offers a different and unique, but relevant, perspective;
- Contributes to moving the discussion and analysis forward;
- Builds on other comments;
- Transcends the "I feel" syndrome. That is, it includes some evidence, argumentation, or recognition of inherent tradeoffs. In other words, the comment demonstrates some reflective thinking.

If a student expects to miss a class (or be late), the instructor should be notified as soon as possible.

Late/incomplete submission of assignments

Late assignments may not be eligible for full credit at the discretion of the instructor.

Make-ups, rewrites, and extra credit
Students may elect to submit a rewritten assignment at the discretion of the instructor. No extra credit will be given in this course.

Expectations of students

Because this is a graduate level course, students are expected to contribute to class discussions, activities, assignments, etc. as public health professionals. A few expectations include:

- Arriving to class on time
- Reading assigned course material
- Submitting course assignments on time via Blackboard
- Being attentive and engaged in class discussions and activities
- Seeking help when appropriate
- Using AMA Style for all submitted course assignments

Expectations for the instructor

As the instructor and facilitator of the course, you can expect the following from me:

- To start and end class on time
- To reply to e-mails within 24 hours on weekdays and 48 hours on weekends
- To facilitate class discussions, activities, etc. that are reflective of advanced public health research and practice
- To assign course assessments that adequately cover the material and meets the learning objectives of the course while adhering to the time expectations for a 3-credit graduate course
- To serve as a colleague and mentor for DPH/SPH program questions, concerns, etc.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity
CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

Our course schedule is subject to change throughout the semester. The "Last Updated" date in the header of the syllabus is meant to reference the current version of the syllabus. Any updated syllabi will be uploaded to Blackboard.

Please refer to the official Graduate Center academic calendar for important dates. It can be found here: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Registrar/Fall-2015-Academic-CalendarRev.pdf?ext=.pdf

Last Updated September 2, 2015

Session & Date	Topics/Activities	Required & Recommended Reading(s)	Due/Present
Session 1 September 1st	1) Introduction to the Course, Policies & Expectations 2) Systems Thinking & Public Health 3) Program/Policy Evaluation vs. Research 4) Standards of Evaluation: Utility, Feasibility, Propriety & Accuracy 5) Identifying a Public Health Program/Policy to Evaluate 6) Identifying Stakeholders (Clients or Consumers of Evaluation)	1) Rossi, et al., Chapter 1 2) CDC. (1999). Framework for Evaluation in Public Health. *MMWR, 48*(RR11), 1-40. 3) Roux, A. V. D. (2011). Complex systems thinking and current impasses in health disparities research. *American Journal of Public Health*, *101*(9), 1627-1634. 4) Leischow, S. J., & Milstein, B. (2006). Systems thinking and modeling for public health practice. *American Journal of Public Health*, *96*(3), 403-404.	
Session 2 September 8th	1) Formative vs. Summative Evaluation (Evaluation Approach): Purposes, Benefits, Expectations 2) Determining the Program/Policy's Development/Phase (Generalized Planning Model) 3) Program/Policy Goals & SMART Objectives 4) Envisioning the Evaluation Plan 5) Engaging Stakeholders in the Evaluation Process & CBPR 6) Efficacy vs. Effectiveness; Evidence-Based vs. Evidence-Informed	1) Rossi et al., Chapter 2 2) Herman et al., Introduction & Chapter 1 3) Pettman, T. L., Armstrong, R., Doyle, J., Burford, B., Anderson, L. M., Hillgrove, T., & Waters, E. (2012). Strengthening evaluation to capture the breadth of public health practice: ideal vs. real. *Journal of Public Health*, *34*(1), 151-155. 4) Gilliam, A., Davis, D., Barrington, T., Lacson, R., Uhl, G., & Phoenix, U. (2002). The value of engaging stakeholders in planning and implementing evaluations. *AIDS Education and Prevention*, *14*(3 Supplement), 5-17. 5) March of Dimes. (2005). SMART Objectives Worksheet. http://www.marchofdimes.org/chapterassets/files/SMART_objectives.pdf 6) Nevo, I., & Slonim-Nevo, V. (2011). The myth of evidence-based practice: Towards evidence-informed practice. *British Journal of Social Work*, bcq149. 7) Kirkhart, K. E. (2010). Eyes on the prize: Multicultural validity and evaluation theory. *American Journal of Evaluation*, *31*(3), 400-413.	
September 15th	**NO CLASSES SCHEDULED**	**NO CLASSES SCHEDULED**	**NO CLASSES SCHEDULED**

September 22nd	**NO CLASSES SCHEDULED**	**NO CLASSES SCHEDULED**	**NO CLASSES SCHEDULED**
Session 3 September 25th **NOTE: CLASS IS ON A FRIDAY**	1) Describing the Program/Policy: Logic & Conceptual Models 2) Focusing the Evaluation & Developing Evaluation Questions/Evaluation Framework 3) Ethics in Evaluation 4) Funding Meaningful Evaluations	1) Rossi et al., Chapters 3-5 2) Teti, M., Murray, C., Johnson, L., & Binson, D. (2012). Photovoice as a community-based participatory research method among women living with HIV/AIDS: Ethical opportunities and challenges. *Journal of Empirical Research on Human Research Ethics*, *7*(4), 34-43. 3) Gondolf, E. W. (2000). Human subject issues in batterer program evaluation. *Journal of Aggression, Maltreatment & Trauma*, *4*(1), 273-297.	1) Program/Policy Evaluation "Good Fit" Checklist (no credit)
Session 4 September 29th	1) More on Formative vs. Summative Evaluation: Process & Outcome M&E 2) Evaluation Focus: Strengths, Weaknesses & Matching the Design to Program/Policy Theory, Goals & Objectives 3) Critical Discussion Leader(s): Madeline	1) Rossi et al., Chapters 6 & 7 2) Herman et al., Chapter 2 3) Moore, G., Audrey, S., Barker, M., Bond, L., Bonell, C., Cooper, C., & Baird, J. (2014). Process evaluation in complex public health intervention studies: the need for guidance. *Journal of Epidemiology and Community Health*, *68*(2), 101-102. 4) Neiger, B. L., Thackeray, R., Burton, S. H., Giraud-Carrier, C. G., & Fagen, M. C. (2013). Evaluating social media's capacity to develop engaged audiences in health promotion settings use of Twitter metrics as a case study. *Health Promotion Practice*, *14*(2), 157-162. 5) National Cancer Institute, N.I.H./U.S.D.H.H. (2005). Theory at a glance: a guide for health promotion practice. 6) Branscum, P., Sharma, M., Wang, L. L., Wilson, B., & Rojas-Guyler, L. (2013). A process evaluation of a social cognitive theory–based childhood obesity prevention intervention: The comics for health program. *Health Promotion Practice*, *14*(2), 189-198. 7) May, P. A., Serna, P., Hurt, L., & DeBruyn, L. M. (2005). Outcome evaluation of a public health approach to suicide prevention in an American Indian	1) Response Paper #1

		tribal nation. *American Journal of Public Health*, *95*(7), 1238.	
Session 5 **October 6th**	1) Evaluation Design & Assessing Impact: RCTs, Quasi-Experimental, Observational/Non-Experimental & Other Possible Designs 2) Qualitative, Quantitative, Mixed & Multi-Methods in Evaluation Design: Concepts, Constructs, Variables & Operationalization 3) Critical Discussion Leader(s): 4) Peer Feedback:	1) Rossi et al., Chapters 8 & 9 2) Herman et al., Chapters 3 & 4 3) Cousens, S., Hargreaves, J., Bonell, C., Armstrong, B., Thomas, J., Kirkwood, B. R., & Hayes, R. (2009). Alternatives to randomisation in the evaluation of public-health interventions: statistical analysis and causal inference. *Journal of Epidemiology and Community Health*, *65*(7), 576-581. 4) Bonell, C. P., Hargreaves, J., Cousens, S., Ross, D., Hayes, R., Petticrew, M., & Kirkwood, B. R. (2011). Alternatives to randomisation in the evaluation of public health interventions: design challenges and solutions. *Journal of Epidemiology and Community Health*, *65*(7), 582-587. 5) Moore, L., & Moore, G. F. (2011). Public health evaluation: which designs work, for whom and under what circumstances?. *Journal of Epidemiology and Community Health*, *65*(7), 596-597. 6) Robinson, B. B. E., Uhl, G., Miner, M., Bockting, W. O., Scheltema, K. E., Rosser, B. S., & Westover, B. (2002). Evaluation of a sexual health approach to prevent HIV among low income, urban, primarily African American women: results of a randomized controlled trial. *AIDS Education and Prevention*, *14*(3 Supplement), 81-96. 7) Bonell, C., Fletcher, A., Morton, M., Lorenc, T., & Moore, L. (2012). Realist randomised controlled trials: a new approach to evaluating complex public health interventions. *Social Science & Medicine*, *75*(12), 2299-2306.	1) Evaluation Plan Component #1 (Background)
Session 6 **October 13th**	1) Recruitment & Sampling: Developing & Maintaining Sampling Frames 2) Guest Speaker: Sabina Hirshfield, PhD, Senior Research Scientist,	1) Kuhns, L. M., Kwon, S., Ryan, D. T., Garofalo, R., Phillips II, G., & Mustanski, B. S. (2014). Evaluation of respondent-driven sampling in a study of urban young men who have sex with men. *Journal of Urban*	

	Public Health Solutions 3) Critical Discussion Leader(s): 4) Peer Feedback:	*Health*, 1-17. 2) Ulfsdotter, M., Enebrink, P., & Lindberg, L. (2014). Effectiveness of a universal health-promoting parenting program: a randomized waitlist-controlled trial of All Children in Focus. *BMC Public Health*, *14*(1), 1083. 3) Namageyo-Funa, A., Rimando, M., Brace, A. M., Christiana, R. W., Fowles, T. L., Davis, T. L., & Sealy, D. A. (2014). Recruitment in qualitative public health research: Lessons learned during dissertation sample recruitment. *The Qualitative Report*, *19*(4), 1-17. 4) Neiger, B. L., Thackeray, R., Van Wagenen, S. A., Hanson, C. L., West, J. H., Barnes, M. D., & Fagen, M. C. (2012). Use of social media in health promotion purposes, key performance indicators, and evaluation metrics. *Health promotion practice*, *13*(2), 159-164.	
Session 7 **October 20th**	1) Measurement in Evaluation: Validity, Reliability, Development & Characteristics of Strong Measures 2) Data Collection: More on Qualitative/Quantitative/Mixed/Multi-Methods 3) Critical Discussion Leader(s): 4) Peer Feedback:	1) Wilkerson, J. M., Iantaffi, A., Grey, J. A., Bockting, W. O., & Rosser, B. S. (2014). Recommendations for Internet-based qualitative health research with hard-to-reach populations. *Qualitative Health Research*, *24*(4), 561-574. 2) Lubans, D. R., Hesketh, K., Cliff, D. P., Barnett, L. M., Salmon, J., Dollman, J., & Hardy, L. L. (2011). A systematic review of the validity and reliability of sedentary behaviour measures used with children and adolescents. *Obesity Reviews*, *12*(10), 781-799. 3) Messick, S. (1975). The standard problem: Meaning and values in measurement and evaluation. *American Psychologist*, *30*(10), 955. 4) Paul, M. J., & Dredze, M. (2011, July). You are what you Tweet: Analyzing Twitter for public health. In *ICWSM* (pp. 265-272). 5) Greene, J. A., Choudhry, N. K., Kilabuk, E., & Shrank, W. H. (2011). Online social networking by patients with diabetes: a qualitative evaluation of communication with Facebook. *Journal of General*	

		Internal Medicine, *26*(3), 287-292.	
Session 8 October 27th	1) Data Analysis Plan: Does the Analysis Fit the Evaluation Design & Data? 2) Detecting Program/Policy Effect & Practical Significance; Data Limitations 3) Connecting Data Analysis Plan to Program/Policy Goals & Objectives 4) Connection to Dissertation Research Proposals/Plans 5) Effect Size Conversion (Excel File Tool) 6) Critical Discussion Leader(s): 7) Peer Feedback:	1) Rossi et al., Chapter 10 2) Klassen, A. C., Creswell, J., Plano Clark, V. L., Smith, K. C., & Meissner, H. I. (2012). Best practices in mixed methods for quality of life research. *Quality of Life Research*, *21*(3), 377-380. 3) Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior*, *27*(5), 591-615.	
Session 9 November 3rd	1) Methods for Analyzing Qualitative & Quantitative Data: Descriptive & Inferential 2) Introduction/Review of Software Specific to Different Types of Analysis 3) Writing-Up Qualitative/Quantitative Results: Best Practices & Recommendations 4) Statistical Test Cheat Sheet 5) Critical Discussion Leader(s): 6) Peer Feedback:	1) International Agency for Research on Cancer. 3.2: General Mediators and Moderators of Tobacco Use Behavior. http://www.iarc.fr/en/publications/pdfs-online/prev/handbook12/ 2) Malterud, K. (2012). Systematic text condensation: a strategy for qualitative analysis. *Scandinavian Journal of Public Health*, *40*(8), 795-805. 3) Palinkas, L. A., Aarons, G. A., Horwitz, S., Chamberlain, P., Hurlburt, M., & Landsverk, J. (2011). Mixed method designs in implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, *38*(1), 44-53.	1) Evaluation Plan Component #2 (Description of the Evaluation)
Session 10 November 10th **NOTE: Class will not meet face-to-face. Discussion will occur on Blackboard**	1) Budgeting for Evaluations 2) Measuring Efficiency	1) Rossi et al., Chapter 11 2) Habicht, J. P., Victora, C. G., & Vaughan, J. P. (1999). Evaluation designs for adequacy, plausibility and probability of public health programme performance and impact. *International Journal of Epidemiology*, *28*(1), 10-18.	1) Response Paper #2

Session 11 November 17th	1) Evaluating Advocacy & Policy: What's Different? 2) Guest Speaker: Mary McFarlane, PhD, Centers of Disease Control & Prevention, Division of STD Prevention 3) Critical Discussion Leader(s): 4) Peer Feedback:	1) Wallerstein, N. B., Yen, I. H., & Syme, S. L. (2011). Integration of social epidemiology and community-engaged interventions to improve health equity. *American Journal of Public Health*, *101*(5), 822. 2) Brownson, R. C., Seiler, R., & Eyler, A. A. (2010, July). Measuring the Impact of Public Health Policy. *Preventing Chronic Disease*, *7*(4), A77. 3) Friedman, A. L., Brookmeyer, K. A., Kachur, R. E., Ford, J., Hogben, M., Habel, M. A., & McFarlane, M. (2014). An assessment of the GYT: Get Yourself Tested Campaign: An integrated approach to sexually transmitted disease prevention communication. *Sexually Transmitted Diseases*, *41*(3), 151-157. 4) Dorfman, L., Wallack, L., & Woodruff, K. (2005). More than a message: Framing public health advocacy to change corporate practices. *Health Education & Behavior*, *32*(3), 320-336. 5) Harvard Evaluation Exchange. (2007, Spring). *The Evaluation Exchange*, 22-23. 6) Organization Research Services. (2007). *A Guide to Measuring Advocacy & Policy*. Baltimore: ORS.	1) Evaluation Outcomes Component #1 (Results/Findings)
Session 12 November 24th	1) Meta-Evaluation in Public Health 2) The Evaluation Report: Utility, Feasibility, Propriety & Accuracy Revisited 3) Critical Discussion Leader(s): 4) Peer Feedback:	1) Rossi et al., Chapter 12 2) Herman et al., Appendix A 3) Stufflebeam, D. L. (2001). The metaevaluation imperative. *American Journal of Evaluation*, *22*(2), 183-209. 4) Sherry, A. C., Fulford, C. P., & Zhang, S. (1998). Assessing distance learners' satisfaction with instruction: A quantitative and a qualitative measure. *American Journal of Distance Education*, *12*(3), 4-28. 5) The Joint Committee. (1994). Program Evaluation Standards, Thousand Oaks, CA: Sage Publications. 6) Stufflebeam, D.L. (1999). Program Evaluations	1) Evaluation Outcome Component #2 (Discussion, Conclusions & Recommendations)

		Metaevaluation Checklist.	
Session 13 **December 1st**	1) Disseminating Evaluation Findings: Varying Stakeholders, Modes & Channels 2) Authorship in Publication 3) Critical Discussion Leader(s): Madeline 4) Peer Feedback:	1) Mueller, N. B., Burke, R. C., Luke, D. A., & Harris, J. K. (2008). Getting the word out: multiple methods for disseminating evaluation findings. *Journal of Public Health Management and Practice*, *14*(2), 170-176. 2) Brownson, R. C., Jacobs, J. A., Tabak, R. G., Hoehner, C. M., & Stamatakis, K. A. (2013). Designing for dissemination among public health researchers: findings from a national survey in the United States. *American Journal of Public Health*, *103*(9), 1693-1699. 3) Lawrenz, F., Gullickson, A., & Toal, S. (2007). Dissemination handmaiden to evaluation use. *American Journal of Evaluation*, *28*(3), 275-289.	1) Response Paper #3
Session 14 **December 8th**	1) Translating Evaluation Findings into Practice & Policy 2) Guest Speaker: John Encandela, PhD, Assistant Professor of Psychiatry, Yale University 3) Critical Discussion Leader(s): 4) Peer Feedback:	1) Kelly, C. M., LaRose, J., & Scharff, D. P. (2014). A method for building evaluation competency among community-based organizations. *Health Promotion Practice*, *15*(3), 431-437. 2) Adams, J., & Dickinson, P. (2010). Evaluation training to build capability in the community and public health workforce. *American Journal of Evaluation*. 3) Rychetnik, L., Bauman, A., Laws, R., King, L., Rissel, C., Nutbeam, D., ... & Caterson, I. (2012). Translating research for evidence-based public health: Key concepts and future directions. *Journal of Epidemiology and Community Health*, *66*(12), 1187-1192. 4) Rychetnik, L., Frommer, M., Hawe, P., & Shiell, A. (2002). Criteria for evaluating evidence on public health interventions. *Journal of Epidemiology and Community Health*, *56*(2), 119-127.	
December 15th	1) Student Reports/Presentations		1) Integrated Evaluation Report

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 820 Epidemiologic Methods I: Research Design and Interface
Cross Listed with EPI750 (see syllabus for that course)
3 Credits
Fall 2015

Time and location	Tuesdays 6:30-8:30pm at The Graduate Center (365 5th Avenue) room 6418
Instructor	**Name** Elizabeth Kelvin, PhD, MPH **Title** Assistant Professor **Email** ekelvin@hunter.cuny.edu **Phone** 212-396-7751 **Office** 2180 Third Avenue (119th Street), room 543 Email is the preferred methods of communication
Office hours	Wednesdays 5:00pm – 6:30pm and by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course provides an intermediate-level understanding of the design and conduct of epidemiologic studies, including causal inference, measurement, major study designs, threats to validity, and their application to public health issues. The class includes lectures on research methods, hands-on data analysis exercises, discussions about determining causation through epidemiological research.
Course prerequisites	PH 75100, PH 75300 or equivalent introductory epidemiology and biostatistics courses
Course format	Each class will begin with a lecture. Most classes will then have either a computer-based exercise or a class discussion of the reading assignments following the lecture.
Required reading and resources	• Aschengrau A & Seage GR. Essentials of Epidemiology in Public Health, 3rd edition, Jones and Bartlett publishers, 2014. • Additional assigned readings listed below (pages 11-16) are available blackboard.
Suggested reading and resources	• Susser E, Schwartz S, Morabia A, & Bromet EJ. Psychiatric Epidemiology, 1st edition, Oxford University Press, 2006. • SPSS is suggested but not required. If you decide to purchase a license, be sure that it allows you to open large datasets (which will be necessary in some classes), write syntax, and run various forms of regression including Cox proportional hazards models. Student packages may not provide all the features needed for this class. The software is available for student use outside of class at the Hunter and Graduate Center computer labs and to GC students via

	the intranet. Note that GC students may not have access to the Hunter computer labs.

DPH Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify, develop, evaluate and recommend policy and programmatic interventions to improve population health at individual, community, government and country levels based on empirical evidence of social, political, cultural, biological, economic, historical, behavioral, environmental, and global factors in health and disease.	• Be able to recognize study design, study population, main research objectives, analytic methods used, main findings and implications of epidemiologic articles • Discuss strengths and weaknesses of epidemiologic articles in terms of research question, design, data collection, analysis and interpretation • Discuss policy implications of epidemiological research	• Written assignment • Class computer labs • Computer assignments • Class exams • Class discussion
Design and conduct etiological, intervention, policy, implementation science and other empirical studies that contribute to new knowledge about population health	• Choose and apply appropriate study designs to answer different research questions, taking scientific merits, feasibility, cost, and logistics in account • Construct analytic plans appropriate to datasets and research questions provided • Apply descriptive statistics to characterize the distribution of health conditions • Set up regression models (linear, logistic, Cox) that are suitable for the data and research question.	• Written assignment • Class computer labs • Computer assignments • Class exams • Class discussion

	• Apply and interpret regression model parameters and draw conclusions about hypotheses • Calculate an odds ratio, risk ratio and rate ratio by hand and using statistical software	
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues.	• Discuss the strengths and limitations of systematic literature reviews and meta-analysis	• Class exams • Class discussion
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	• Present analytic results in table and text format.	• Class computer labs • Computer assignments • Class exams

Course Assessments
Your understanding of the course material will be evaluated through class discussion and computer lab participation, 3 computer assignments, one written assignment and two exams.

Grading
The course grade will be calculated based on (1) class participation, (2) a written assignment, (3) three graded computer assignments (4) a midterm exam and (5) a final exam.

1. Class Participation: Students are expected to prepare for the class in advance by doing the reading and thinking about the discussion topic before class. Attendance and active participation in the discussions are expected and will be calculated as part of the course grade. Students may miss two classes with no impact on their participation grade.

2. Written Assignment: Students are asked to write a position paper discussing assessment of causation in epidemiology. The purpose of the position paper is to help students organize their thoughts on a topic of importance in epidemiology and develop an informed argument to support their ideas. Each paper should begin with a clear statement of the student's position, or thesis, followed by a structured argument supporting that thesis, describing and discussing the limitations of the counter-arguments. The paper should be no more than 5 pages long, double spaced, 12-point font with 1 inch margins. The paper will be assigned a numeric grade based on how well the student supports his/her thesis using the class readings. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

Students may discuss their papers with each other but must turn in their own, independently conceptualized and written assignment and are asked to ***not*** share their draft papers with others. Sources, including readings assigned for this class, must be appropriately cited and referenced (please use AMA citation format or that used by *Epidemiology*). Citation software is available for free from the university (http://library.gc.cuny.edu/sp/subjects/Citation%20Guides) and it is expected (i.e. required) that students will use citation software.

PAPER TOPIC: Is it possible to prove causation in epidemiology? Your paper should include a discussion about what we mean by a cause in epidemiology (definition), how we conceptualize causes and try to identify them in epidemiology, with specific reference to the thinking behind the RCT, cohort and case control study designs, and the limitations of epidemiology in identifying causes? – Due December 2

Grading Rubric for Written Assignment	
Criterion	% of assignment grade
Position stated clearly upfront	20%
Evidence provided to support thesis and well organized into a structured argument	30%
Conclusion supported by the evidence	20%
Writing clear, organized and grammatically correct	20%
Citations correctly identified	10%
GRADE	100%

3. Computer Assignments: Students will be asked to submit three computer assignments (see schedule below). If time permits, students may begin exercises during class and then complete and format the document to include appropriate interpretation, tables, and syntax on their own. The final document should include the SPSS tables (only the pertinent tables) and text to answer each question in the main document and the comprehensive syntax used for all analyses in an appendix pasted at the end of the word document. Students may discuss their assignments with each other but must turn in their own, independently analyzed and written assignment. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

4. Midterm Exam: Students will have a take home midterm exam to complete in 1 week, consisting of short answer questions about topics covered during class lectures and in readings. Students must work independently and not discuss the exam with

classmates. The exam should be typed double spaced with 12-point font and 1 inch margins and should be e-mailed to the instructor by 8:30pm on the due date. Late midterms will lose 10 points out of 100 for each day they are late (including weekends and holidays).

5. Final Exam: The final exam will be a take-home computer assignment involving statistical analysis in SPSS of an analytic question, and students are expected to analyze the provided data, interpret findings in the context of the literature, and draw conclusions. The exam must be completed independently and students may not discuss the exam with classmates. Students will be given the questions 1 week before the exam is due. The final exam should be typed double spaced with 12-point font and 1 inch margins and should be turned in at the beginning of class or e-mailed before the class begins. Late finals will lose 10 points out of 100 for each day they are late (including weekends and holidays).

The relative weight of each course component is as follows:

Assessment	Weight
Class participation	5%
Written assignment	20%
3 Computer assignments	25%
Midterm exam	25%
Final exam	20%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Students are expected to prepare for the class in advance by doing the reading and thinking about the discussion topic before class. Attendance and active participation in the discussions are expected and will be calculated as part of the course grade. Students may miss two classes with no impact on their participation grade.

Late/incomplete submission of assignments
See assignment specific rules under the Grading section above.

Make-ups, rewrites, and extra credit
Make-ups, rewrites, and extra credit assignments are not allowed.

Expectations of students
- You must sign up for Blackboard so that you can obtain course readings, updates and lecture notes and other handouts. For instructions on registering for a portal account in order to access Blackboard, go to: https://portal.cuny.edu/portal/site/cuny/index.jsp?epi-content=LOGIN.
- For this course we will be using the blackboard site for PUBH820, so the EPI750 students should make sure they can access that course.
- Please forward your CUNY e-mail to your most frequently checked e-mail address. Check your e-mail regularly so that you can receive emergency communications and periodic updates about the class.
- You are expected to complete readings and written assignments prior to class.

- SPSS version 22 or 23 will be used during most classes and is used for some assignments. The CUNY license covers only on-campus use. The software is available for student use in the CUNY School of Public Health at Hunter College and the Graduate Center computer labs outside of class hours. For Graduate Center students, the software is also available in computer labs and via the intranet.
- Students might want to bring a thumb-drive to class when computer exercises are planned to save their work. Alternately they can e-mail the documents created in class to themselves for archiving.
- If you do not have SPSS on your home computer, you will need to export the SPSS syntax and output to PDF or paste it into a word document in order to access it on your home computer. If you use a MAC, PDFing the documents may make it easier to open them on your computer.
- Student assignments should be turned-in on paper at the beginning of class. However, if a student will not be able to attend a class, assignments can be e-mailed to the instructor before the class begins (e.g. before 6:30pm the day of the class) to receive credit. The instructor will reply when a document is received, so if a reply is not received by the student within a few hours he/she should contact the instructor to be sure that the assignment was sent correctly. Students should save their sent email as a record demonstrating that they turned the assignment in on time in case the email is not received by the instructor.

Expectations for the instructor

- Power Point lecture slides will be available for download on Blackboard prior to class.
- The instructor is available during office hours and by appointment to assist students with assignments, course material, and exam preparation. The preferred method of communication with the instructor is e-mail. Please schedule appointments in advance.
- Emails will be answered within 3 business days. If a student has not heard back within that time period, s/he may want to send the email again. Emails will not be answered after business hours, during weekends or holidays.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on

Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

- Please note that the schedule is subject to change throughout the semester. The "Last Updated" Date in the header of the syllabus is meant to reference the current version of the syllabus and therefore should be updated if a change in schedule is made.
- Students should access the current academic calendar for important dates (for example: holidays, course drop, course withdrawal):
  - For the Graduate Center please see: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Registrar/Fall-2015-Academic-CalendarRev.pdf?ext=.pdf
  - For Hunter College please see: http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%205-27-15.pdf

EPI750 & PH820 Course Schedule			
Date of class	**Lecturer**	**Topic**	**Assignments**
September 1, 2015	Kelvin	1. Introduction, basic study design & statistics review	
September 8, 2015	Kelvin	2. Review common measures of effect & Data Analysis*	
September 25, 2015 (Friday)	Kelvin	3. Causal inference in epidemiology	
September 29, 2015	Kelvin	4. Causal inference in epidemiology	*Computer assignment 1: measures of effect exercise due
October 6, 2015	Kelvin	5. Longitudinal studies (cohort & clinical trials) 1	
October 13, 2015	Kelvin	6. Longitudinal studies (cohort & clinical trials) 2*	
October 20, 2015	Kelvin	7. Case control studies 1	*Computer assignment 2 on longitudinal studies due

October 27, 2015	Kelvin	8. Case control studies 2*	
November 3, 2015	Kelvin	9. Ecological studies & meta analyses	*Computer assignment 3 on case control studies due
November 10, 2015	Kelvin	10. Internal validity: bias and confounding*	
November 17, 2015		11. NO CLASS MEETING	Take home midterm exam due
November 24, 2015	Kelvin	12. External validity & effect measure modification/interaction*	
December 1, 2015	Kelvin	13. Measurement of exposure & mediation	Writing assignment due
December 8, 2015	Kelvin	14. Validity and reliability of variables	
December 15. 2015	Kelvin	15. Infectious diseases & independence	Take home final exam due

* Indicates that the SPSS exercise from this class is to be turned-in for grading on the specified date

READING ASSIGNMENTS: (Readings should be completed before the lecture)

CLASS 1 (September 1, 2015): Introduction, basic study design & statistics review

Discussion topic: Why are epidemiologic findings so easily misinterpreted? Is public skepticism warranted? To what extent is it our responsibility to make sure our science findings are properly communicated within public domains?

Assigned Readings: None

CLASS 2 (September 8, 2015): Review common measures of effect & Data analysis

Discussion Topic: What are some of the measures of effect or association that are commonly used in Epidemiology? Are there questions of interest better answered by certain measures of effect than by others?

Assignment: Computer assignment 1 - measures of effect exercise & data analysis. **Due October 6, 2015.**

Assigned Readings:

1) Aschengrau text Ch. 2 & 3.
2) Northridge ME. Annotation: public health methods—Attributable risk as a link between causality and public health action. *American Journal of Public Health* 1995; 85:1202-1204.
3) Morabia A. The Essential Tension Between Absolute and Relative Causality *American Journal of Public Health* 2001; 91(3): 335-336
4) Davies HT, Crombie IK, Tavakoli M. When can odds ratios mislead? British Medical Journal 1998; 316: 989-991.

Recommended readings:

1) Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA* 1998; 280: 1690-1691.
2) Schwartz LM, Woloshin S, Dvorin EL, Welch HG. Ratio measures in leading medical journals: structured review of accessibility of underlying absolute risks. BMJ 2006; 333(7581):1248.
3) Stevens J, Cai J, Juhaeri, Thun MJ, Williamson DF, Wood JL. Consequences of the use of different measures of effect to determine the impact of age on the association between obesity and mortality. Am J Epidemiology 1999; 150(4): 399-407.
4) LeardMann CA, Powell TM, Smith TC, Bell MR, Smith B, Boyko EJ, Hooper TI, Gackstetter GD, Ghamsary M, Hoge CW. Risk factors associated with suicide in current and former US Military personnel. JAMA 2013; 310(5): 496-506.

CLASSES 3 & 4 (September 25 & September 29, 2015): Causal inference in epidemiology

Discussion topic: One of the primary purposes of epidemiology is to identify causes of health outcomes. What is a “cause”? How do we identify causes in epidemiology? What are some of the limitations of current epidemiological methods in identifying causes?

Assigned Readings:

1) Aschengrau text Ch.15.
2) Susser text pp. 33-52.

3) Greenland S, Pearl J, Robins, JM. Causal Diagrams for Epidemiologic Research. (1999) Epidemiology; 10(1): 37-48.
4) M Parascandola, D L Weed. (2001) Causation in epidemiology. *J Epidemiol Community Health* 2001;**55**:905–912.
5) Kaufman JS and Poole C. Looking back on "Causal thinking in the health sciences". Annual Review of Public Health 2000; 21: 101-119.
6) Hill AB. The environment and disease: Association or Causation? *Proceedings of the Royal Society of Medicine* 1965; 295-300.
7) Kreiger N. Epidemiology and the Web of Causation: Has anyone seen the spider? *Social Science and Medicine* 1994; 39:887-903.
8) McMichael AJ. Prisoners of the proximate: Loosening the constraints on epidemiology in an age of change. *American Journal of Epidemiology* 1999; 149:887-897.

Recommended readings

1) Taubes G. Epidemiology faces its limits. *Science* 1995; 269(5221):164-169.
2) Susser M, Susser E. Choosing a future for epidemiology: I. eras and paradigms. *American Journal of Public Health* 1996; 86 (5):668-673.
3) Susser M, Susser E. Choosing a future for epidemiology: II. From black box to Chinese boxes and eco-epidemiology. *American Journal of Public Health* 1996; 86 (5):674-677.
4) Feinstein AR. Scientific standards in epidemiologic studies of the menace of daily life. Science 1998; 242: 1257-1263.
5) Schwartz S, Susser E. What can epidemiology accomplish? *International Journal of Epidemiology* 2006; 35(3):587-590.
6) J Pearl. Introduction to Causal Inference – partial article. Int J Biostats 2010; 6: 1-11.

CLASSES 5 & 6 (October 6 & 13, 2015): Longitudinal studies (cohort & clinical trials)

Discussion Topic: What are the strengths and weaknesses of the various longitudinal study designs in assessing causality in general and relative to each other? Where do "natural experiments" fall in the hierarchy of longitudinal study designs?

Assignment: Computer assignment 2 - longitudinal studies. **Due October 27, 2015.**

Assigned Readings:

1) Aschengrau text Ch. 6, 7 & 8
2) Susser text pp. 129-137.
3) Hernan MA. A definition of the causal effect for epidemiologic research. J Epidemiol and Community Health 2004; 58: 265-271.

4) Benson K. Hartz AJ. A comparison of observational studies and randomized, controlled trials. *New England Journal of Medicine 2000*; 342(25):1878-1886.
5) Writing group for the Women's Health Initiative Investigators. Risk and benefits of estrogen plus progestin in healthy postmenopausal women. *JAMA 2002*; 288:321-333.
6) Pedersen AT, Ottesen B. Issues to debate on the Women's Health Initiative (WHI) study. Epidemiology or randomized clinical trials--time out for hormone replacement therapy studies? *Human Reproduction 2003*; 18(11):2241-2244.
7) Berkman LF. Seeing the forest and the trees – from observation to experiments in social epidemiology. Epidemiologic reviews 2004; 26(2): 2-6.
8) Lipsitch M, Tchetgen E, Cohen T. Negative controls: a tool for detecting confounding and bias in observational studies. Epidemiology 2000: 21(3): 383-8.

Recommended readings:

1) Susser E, Hoek HW, Brown A. Neurodevelopmental disorders after prenatal famine: The story of the Dutch Famine Study. *American Journal of Epidemiology 1998*; 147:213-216.
2) Cummins S, Petticrew M, Higgins C, Findlay A. Sparks L. Large scale food retailing as an intervention for diet and health: quasi-experimental evaluation of a natural experiment. *Journal of Epidemiology and Community Health 2005*; 59(12):1035-1040.
3)

CLASSES 7 & 8 (October 20 & 27, 2015): Case control studies

Assignment: Computer assignment 3 - case control studies. **Due November 10, 2015.**

Assigned Readings:

1) Aschengrau text Ch. 9.
2) Susser text pp. 212-225.
3) Morabia A. Case control studies in clinical research: Mechanisms and prevention of selection bias. *Preventive Medicine 1997*; 26:674-677.
4) Bloom MS, Schisterman EF, Hediger ML. Selecting controls is not selecting "normals": design and analysis issues for studying etiology of polycystic ovary syndrome. Fertility & Sterility 2006; 86: 1-12.
5) Susser ES, Schaefer CA, Brown AS, Begg MD, Wyatt RJ. The design of the prenatal determinants of schizophrenia study. *Schizophrenia Bulletin 2000*; 26:257-273.
6) Brown AS, Begg MD, Gravenstein S, Schaefer CA, Wyatt RJ, Bresnahan M, Babulas VP, Susser ES. Serologic evidence of prenatal influenza in the etiology of schizophrenia. *Archives of General Psychiatry 2004*; 61(8):774-780.

CLASS 9 (November 3, 2015): Ecological studies & meta analyses

Discussion Topic: What are the main criticisms of ecologic and meta-analyses study designs, and do you think that these criticisms are warranted? Are these two study designs really worse than the other types of observational studies (cross sectional, cohort, case control, etc.) commonly used in epidemiology? Are they always just a poor substitute for other observational study designs?

Assigned Readings:

1) Aschengrau text Ch. 6
2) Rose, G. Sick individuals and sick populations. Int J Epidemiology 2001; 30: 427-432.
3) Pearce N. The ecological fallacy strikes back. *J Epidemiol Community Health* 2000;**54**:326–327.
4) Schwartz, S. The fallacy of the ecological fallacy: the potential misuse of a concept and the consequences. American Journal of Public Health 1994; 84(5): 819-824.
5) Rosenthal R and DiMatteo MR. META-ANALYSIS: Recent Developments in Quantitative Methods for Literature Reviews. Annu. Rev. Psychol. 2001. 52:59–82.

Recommended readings

1) Shapiro, S. Meta-analysis/Shmeta-analysis. Am Journal of Epidemiology 1994; 140(9):771-778.
2) Petitti, DB. Of babies and bathwater. American Journal of Epidemiology 1994; 140(9): 779-782.
3) Greenland, S. Can meta analysis be salvaged? Am Journal of Epidemiology 1994; 140(9): 783-787.

CLASS 10 (November 10, 2015): Internal validity: bias and confounding

Discussion Topic: A study has internal validity when the measure of effect found in that study is the true, correct measure of effect. What are the major factors that threaten internal validity in epidemiology? How can these factors be addressed to improve internal validity when analyzing your data? What are some of the things you need to consider when trying to maximize internal validity during data analysis?

Assigned Readings:

1) Aschengrau text Ch. 10, 11 & 12.
2) Susser text pp. 138-150.

3) Copeland KT, Checkoway H, McMichael AJ & Holbrook RH. Bias due to misclassification in the estimation of relative risk. American Journal of Epidemiology 1977, 105(5): 488-495.
4) Christenfeld JS, Sloan RP, Carroll D & Greenland S. Risk factors, confounding, and the illusion of statistical control. Psychosometric Medicine 2004, 66: 868-875.
5) Brenner H & Blettner M. Controlling for continuous confounders in epidemiologic research. Epidemiology 1997, 8(4): 429-434.

CLASS 11 (November 17, 2015) NO CLASS MEETING

Assignment: **Take Home Midterm Due**

CLASS 12 (November 25, 2015): External validity & effect measure modification

Assignment: Computer assignment 4 - effect modification.

Discussion Topic: What is effect measure modification? What role does the specific measure of effect used (risk difference, risk ratio, odds ratio, etc.) play in assessing and interpreting effect modification in epidemiologic data? What are the implications of effect modification for epidemiology and public health?

Assigned readings:

1) Aschengrau text Ch. 13
2) Susser text pp. 319-328.
3) Morabia A., Ten Have T, & Landis JR. (1997) Interaction fallacy. J Clin Epidemiology. 50: 809-812.
4) Morabia A. (2007) Epidemiologic interactions, complexity, and the lonesome death of Max von Pettenkofer. American Journal of Epidemiology. 166(11): 1233-1238.

Recommended readings:

1) Oppenheimer GM & Susser E. (2007) Invited commentary: the context and challenge of von Pettenkofer's contributions to epidemiology. American Journal of Epidemiology. 166(11): 1239-1241.
2) Morabia A. (2007) Morabia responds to "context and challenge of von Pettenkofer's contribution to epidemiology. American Journal of Epidemiology. 166(11): 1242-1243.

CLASS 13 (December 1, 2015): Measurement of exposure & mediation

Discussion Topic: What does the term "mediation" refer to? How does this concept fit into Rothman's conceptual scheme of causation with its INUS causes, if at all? What are some of the issues around identifying mediation in epidemiology as discussed by Terry & Rundle?

Writing Assignment (paper): Is it possible to prove causation in epidemiology? Your paper should include a discussion about what we mean by a cause in epidemiology, how we try to identify causes in epidemiology, with specific reference to the thinking behind the RCT, cohort and case control study designs, and the limitations of epidemiology in identifying causes? – **Due December 2, 2014.**

Assigned Readings:

1) Aschengrau text Ch. 15.
2) Rothman KJ. (1995) Causes. American Journal of Epidemiology, 141(2): 90-95.
3) Hafeman DM, Schwartz S. (2008) Opening the Black Box: a motivation for the assessment of mediation. International Journal of Epidemiology, 38:838–845.
4) Terry MB, Neugut AI, Schwartz S, Susser E. (2000) Risk factors for a causal intermediate and an endpoint: reconciling differences. American Journal of Epidemiology, 151(4): 339-345.

CLASS 14 (December 8, 2015): Validity and reliability of variables

Discussion Topic: What do we mean by validity and reliability as it refers to the measurement of a variable (exposure, outcome, confounder, mediator, or effect modifier)? Why are these two concepts important in assessing causality in epidemiology? What methods can we use to evaluate whether a measurement is valid and reliable and what are some of the weaknesses of these methods?

Assigned Readings:

1) Wu AW, Dave NB, Dierner-West M, Sorensen S, Huang I-C, Rivecki DA. (2004)Measuring validity of self-reported symptoms among people with HIV. AIDS Care, 16(7): 876-881.
2) Kleinman RE, Murphy M, Wieneke KM, Desmond MS, Schiff A, Gapinski JA. (2007) Use of a single-question screening tool to detect hunger in families attending a neighborhood health center. Ambulatory Pediatrics, 7(4): 278-284.

Class 15 (December 15, 2015): Infectious diseases & independence

Discussion Topic: Halloran discusses how infectious diseases are "dependent happenings." What does she mean by this and why is this important in investigating potential causes and protective factors for infectious diseases? According to Halloran, how do infectious diseases differ from non-infectious diseases with regard to dependency of events? Do you agree with her that non-infectious diseases are independent?

Assignment: Take home final exam due

Assigned Readings:

1) Halloran ME. Overview of Vaccine Field Studies: Types of Effects and Designs. *Journal of Biopharmaceutical Statistics*, 2006; 16: 415–427.

Recommended readings

1) Halloran ME Struchiner CJ &. Study designs for dependent happenings. *Epidemiology 1991*; 2(5): 331-338.

2) Halloran ME & Struchiner CJ. Causal inference in infectious diseases. *Epidemiology 1995*; 6(2): 142-151.

NOTE: Additional readings may be assigned throughout the semester.

Last Updated August 27, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 821: Epidemiologic Methods II: Study Design and Analysis
3 Credits
Fall 2015

Time and location	Silberman Building, Room 329, Tuesdays 6:05-7:50 PM (except during computer lab sessions, room C08)
Instructor	Assistant Professor, Heidi Jones, PhD MPH Email: hjon@hunter.cuny.edu Phone: 212-396-7750 *Email is the preferred method of communication.*
Office hours	Silberman Building, Room 526 Wednesdays from 4:00-6:00 PM (except during monthly epidemiology seminar) or by appointment
Course website	https://bbhosted.cuny.edu/webapps/blackboard/execute/announcement?method=search&context=course&course_id=_1153017_1&handle=cp_announcements&mode=cpview
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Through lectures and problem-solving workshops, this course broadens the approach to epidemiologic methods, incorporating principles from Methods I into the design and conduct of studies and analysis of epidemiologic data. It consists of lectures and problem-solving workshops.
Course prerequisites	PUBH 820 or equivalent or permission of track coordinator
Course format	While the format for each session will vary, generally we will use the following format: • student questions / review (10 minutes) • lecture (45 minutes) • group work (discussion of articles /in-class exercises - 30 minutes) review of key take home messages (15 minutes)
Required reading and resources	Szklo M, Nieto FJ. *Epidemiology: Beyond the Basics*. 3rd ed. Burlington, MA: Jones and Bartlett Learning, LLC; 2014.*(on reserve at Silberman library)* Additional assigned articles will be available on Bb.
Suggested reading and resources	Rothman KJ, Greenland S, Lash TL. *Modern Epidemiology.* 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008. *(on reserve)* Elliott RJ, Morrell CH. *Learning SAS in the Computer Lab*. 3rd ed. Pacific Grove, CA: Duxbury Press; 2009. *(on reserve)*

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Operationalize studies of the complex interactions between multiple determinants of population health in a variety of settings, exploiting the differences between settings as a source of insight	• Use directed acyclic graphs to identify confounders and colliders • Identify whether specific research questions require representative samples • Assess public health studies against recognized guidelines • Define a cause, explain the strengths and weaknesses of thinking about causality in terms of Rothman's pies, exchangeability or directed acyclic graphs • Explain the difference between a causal factor and a risk factor • Draw directed acyclic graphs showing how loss to follow-up, missing data and misclassification may result in colliding. • Draw the directed acyclic graph for a control exposure and give an example • Compare the causal inferences which can be made from an RCT, an instrumental variable analysis, a cohort study, a case-control study and a cross-sectional study • List all the considerations that affect generalizability of an RCT • Describe key applications of instrumental variable analysis, and key factors which might affect its internal validity	• Homeworks 1-4 • In-class Midterm • Worksheets • Take home final

	• Explain the difference between risk stratification and causal analysis in terms of application and approach	
Design and implement research projects that • Quantify health and the burden of disease in populations • Perform surveys and risk factor analyses • Apply causal inference to study design, study implementation and data analysis; • Identify vulnerable populations and their attributes; apply rigorous methods to examine and monitor health disparities. • Identify effective interventions to improve population health equitably • Evaluate the effectiveness of interventions designed to improve population health • Give appropriate attention to the potential for bias, as well as exposure and outcome measurement issues.	• Define a cause, explain the strengths and weaknesses of thinking about causality in terms of Rothman's pies, exchangeability or directed acyclic graphs • Explain the difference between a causal factor and a risk factor • Draw directed acyclic graphs showing how loss to follow-up, missing data and misclassification may result in colliding. • Draw the directed acyclic graph for a control exposure and give an example • Compare the causal inferences which can be made from an RCT, an instrumental variable analysis, a cohort study, a case-control study and a cross-sectional study • List all the considerations that affect generalizability of an RCT • Describe key applications of instrumental variable analysis, and key factors which might affect its internal validity • Explain the difference between risk stratification and causal analysis in terms of application and approach • Classify biases into structural types and explain how each type of bias may affect an RCT, an instrumental variable analysis, a cohort study, a case-control study and a cross-sectional study	• Homeworks 1-4 • In-class Midterm • Worksheets • Critique • Take home final

Conceptual Framework

The overarching conceptual framework for this course centers on the counterfactual definition of a cause, specifically how this definition is incorporated into observational study design, analysis and interpretation of results, and ultimately our ability to make causal inference.

Course Assessments

Your understanding of the course material will be evaluated through four homework assignments using SAS statistical software (based on in-class laboratory exercises), an in-class midterm, a take home final exam, nine worksheets based on the readings and class participation

Homework: There will be 4 homework assignments based on the in-class SAS exercises for which you will need to analyze data and interpret findings in SAS, and that comprise 30% of your grade.

Exams: There will be an in-class, closed book midterm with short answer questions and hand calculations. There will also be a cumulative take home exam, which will include short answer questions, reviewing a published article, and analyzing and interpreting data in SAS.

Worksheets: There will be 9 worksheets with practice calculations and/or short answer responses to the readings. These worksheets will help to focus your reading of the material and prepare you for class discussions. They will be graded as credit/no credit for completion, and comprise 5% of your grades.

Critique: You will be assigned an article for which you will need to write a 2-3 page critique, highlighting the strengths and limitations of the study design, data analysis and conclusions.

Attendance and class participation: The reading assignments will help you master course materials and actively participate in class; 5% of your grade will be based on your class participation and attendance.

Grading

Evaluation criteria

Homework assignments and exams will be graded based on the extent to which the answers are correct. The worksheets will be graded as credit/no credit. I will use the following rubric for class participation:

Class participation grading rubric (5% of your grade, perfect score=20)*

	Strong work (4-5)	Needs development (2-3)	Unsatisfactory (0-1)
Active listening (5 points)	Actively and respectfully listens to peers and instructors	Sometimes displays lack of interest in comments of others, occasionally 'tunes out'	Projects lack of interest or disrespect for others, checks email, instant messages / text messages, non-course internet material during class time
Preparation (5 points)	Arrives fully prepared with all assignments and reading completed, arrives to class with questions	Sometimes arrives unprepared or with only superficial preparation	Exhibits little evidence of having read or thought about assigned material
Quality of contributions to class discussions (5 points)	Comments and questions frequently help move seminar discussion forward	Comments and questions sometimes advance the discussion, but sometimes do little to move it forward	Comments do not advance the conversation or are actively harmful to it, or student does not participate in class discussions
Attendance (5 points)	Arrives to class on time, does not have unexcused absences	Usually arrives to class on time, informs instructor about unavoidable absences	Arrives consistently late, does not inform instructor about absences

* adapted from: http://www46.homepage.villanova.edu/john.immerwahr/TP101/EvDay/discussion%20rubric.pdf. Accessed on July 21, 2010

The relative weight of each course component is as follows:

Assessment	Weight
Homework assignments (average score)	25%
Midterm (in-class)	25%
Final exam (take home)	30%
Article critique	10%
Worksheets	5%
Class participation	5%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Class will begin promptly to maximize our time together. Please arrive to class on time, and be prepared to contribute to class discussion. The lectures will be video-taped and made available on Blackboard for excused absences. Please note that group discussions and laboratory exercises will not be taped. Participation and in-class attendance are worth 5% of your grade.

Late/incomplete submission of assignments

Homework assignments are due electronically at 6 PM, prior to the beginning of class. The final exam is due at midnight. **Late assignments will receive 4 points (out of**

100) deducted for every day late and NO assignments will be accepted more than 3 days late (i.e. later than 6 PM on Friday).

Make-ups, rewrites, and extra credit
There will be not be a make-up exam for the in-class midterm. Depending on how the class performs on the midterm, there may be an opportunity for extra credit for this exam; there will not be any other opportunities for extra credit or rewrites.

Expectations of students
Attend lectures & labs, read textbook and articles prior to class, participate during class discussions, seek help/ask questions early and often, provide the instructor with constructive feedback on course material and content, and, hopefully, have fun with the material.

Expectations for the instructor
I will respond to emails within 24-48 hours, excluding weekends. I will tailor the class to your needs and interests depending on the feedback I receive. Generally, I will return graded homework assignments within two weeks (will return them within one week, when possible).

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity
CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

"Green" policies
In an attempt to save paper, homework assignments and the take home final exam will be submitted electronically and will be returned electronically, with comments in track changes. Suggestions for other adjustments to the course to reduce environmental impact are always welcome. Be sure to check your Hunter or Graduate Center email address regularly for class announcements and assignments.

Use of Blackboard

You must sign up for Blackboard to receive course readings, updates and obtain lecture notes and other handouts. For instructions on registering for Blackboard, go to: http://bb.hunter.cuny.edu. Please make sure that you have access to Blackboard through Hunter.

Acknowledgements

This syllabus builds upon courses given by Drs. Sharon Schwartz and Mary Beth Terry, professors in epidemiology at the Mailman School of Public Health at Columbia, and Dr. Luisa Borrell at the CUNY School of Public Health at Lehman College. Additionally, I would like to acknowledge Dr. Mary Schooling at the CUNY School of Public Health at Hunter College, who also teaches this course and has made improvements and adjustments in previous semesters.

Course Schedule

Please note, while the overall content of this course will be covered as outlined, the syllabus may change based on the need to adapt to student interests, feedback and expertise. Always check the Blackboard site for the most up-to-date information on course readings and assignments.

Theme		Date	Topic	Readings and Assignments
Main association between exposure and outcome and causal inference	1	09/01/15	Causation and causal inference	• Rothman, Greenland & Lash, Chapter 2, Causation and causal inference • Broadbent A. Causation and models of disease in epidemiology. *Stud Hist Philos Biol Biomed Sci*. 2009;40:302-11.
	2	09/08/15	RCT and cohort designs; age, period cohort analyses	• Szklo & Nieto, Chapter 1 • Schultz et al. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomized trials. *BMJ*. 2010;340:c332. • Keyes KK et al. What is a cohort effect? Comparison of three statistical methods for modeling cohort effects in obesity prevalence in the United States, 1971-2006. *Soc Sci Med.* 2010;70:1100-8. • **Worksheet 1 due at 6 PM**
		09/15/15 & 09/22/15	No class scheduled	
	3	09/29/15	**Lab 1:** Introduction to SAS, measures of frequency, association and non-parametric survival analysis	• Szklo & Nieto, Chapter 2 & 3 • **Worksheet 2 due at 6 PM** • ***Note: Class will be in Room C08***
	4	10/06/15	Case control studies and sampling design and methods	• Abelson, *Statistics as Principled Argument.* Hillsdale, NJ: Lawrence Erlbaum Associates; 1995, Chapter 1, Making claims with statistics. • Walker. Reporting the results of epidemiologic studies. *Am J Public Health*. 1986:76:556-8. • Outlaw et al. Using motivational interviewing in HIV field outreach with young African American men who have sex with men: A randomized clinical trial. *Am J Public Health*. 2010:100:S146-51 • **Worksheet 3 due at 6 PM**
	5	10/13/15	**Lab 2:** Sample size and power in SAS	• Kelsey, Whittemore, Evans & Thompson. *Methods in Observational Epidemiology*. New York, NY: Oxford University Press, 1996, Chapter 12, Methods of sampling and estimation of sample size.

Theme		Date	Topic	Readings and Assignments
				• Braitman. Confidence intervals extract clinically useful information from data. *Ann Intern Med*. 1988:108:296-8 • Rothman. Significance questing. *Ann Intern Med.* 1986:445-7. • Nuzzo.Statistical errors.*Nature.2014:506:150-2* • **Homework 1 due at 6 PM** • ***Note: Class will be in Room C08***
Threats to internal validity / alternative explanations	6	10/20/15	Selection and information bias	• Szklo & Nieto Chapter 4, • Gradus et al. Acute stress reaction and completed suicide. *Int J Epidemiol* 2010:doi.10.1093/ije/dyq112:1-7 • **Worksheet 4 due at 6 PM**
	7	10/27/15	Confounding	• Szklo & Nieto Chapter 5, • Greenland & Robins. Identifiability, exchangeability, and epidemiological confounding. *Int J Epidemiol* 1986;15:413-9. • Maldonado & Greenland. Estimating causal effects. *Int J Epidemiol* 2002;31-422-29. • **Homework 2 due at 6 PM** • **Worksheet 5: Bring to class 5 sample midterm questions on index cards (with answers on the back)**
	8	11/03/15	MIDTERM	
Strengthening causal inference and hypotheses / causal partners and causal mechanisms	9	11/10/15	Effect measure modification & mediation	• Szklo & Nieto Chapter 6 & App. C, • Hafeman & Schwartz. Opening the black box: a motivation for the assessment of mediation. *Int J Epidemiol.* 2009;38:838-45. • Knol et al. When one depends on the other: reporting of interaction in case-control and cohort studies. *Epidemiology*. 2009:20:161-66 • Suzuki, Yamamoto & Tsuda. Identification of operating medication and mechanism in the sufficient-component cause framework. *Eur J Epidemiol* 2011:26:347-57. • Van der Weele. Subtleties of explanatory language: what is meant by “mediation”? *Eur J Epidemiol.* 2011;26:343-6. <u>Optional:</u> • Kaufman. Interaction reaction. *Epidemiology*. 2009:20:159-60

Theme		Date	Topic	Readings and Assignments
				• **Worksheet 6 due at 6 PM** • **Critique due at 6 PM**
	10	11/17/15	**Lab 3**: Data analysis for confounding, mediation and effect measure modification	• Ahlbom A, Alfredsson L. Interaction: a word with two meanings creates confusion. *Eur J Epidemiol*. 2005;20:563-4 • Andersson T et al. Calculating measures of biological interaction. *Eur J Epidemiol.* 2005;20:575-9. • Karp. Getting started with proc logistic. *SUGI* Paper 26. <u>Optional:</u> • Szklo & Nieto chapter 7 • **Worksheet 7 due at 6 PM** • ***Note: Class will be in Room C08***
	11	11/24/15	**Lab 4:** Cox proportional hazards model, adjusted SEs using SUDAAN	• Szklo & Nieto Chapter 7 • Smith et al. Survival analysis using cox proportional hazards modeling for single and multiple event time data. *SUGI* Paper 28 <u>Optional:</u> • Clark et al. Survival analysis Part 1: basic concepts and first analyses. *Brit J Cancer* 2003;89:232-8. • Bradburn et al. Survial analysis Part 2: multivariate data analysis – an introduction to concepts and methods *Brit J Cancer* 2003;89:431-6 • ***Note: Class will be in Room C08***
	12	12/01/15	Directed Acyclic Graphs (lab) **Worksheet 8 in class**	• Hernán et al. Causal knowledge as a prerequisite for confounding evaluation: an application to birth defects epidemiology. *Am J Epidemiol*. 2002;155:177-84. • Shrier et al. Reducing bias through directed acyclic graphs. *BMC Med Res Meth.* 2008;doi:10.1186/1471-2288-8-70. • Yang et al. Serum folate and cancer mortality among US adults: findings from the NHANES. *Cancer Epidemiol Biomarkers Prev* 2009;18:1439-47. • **Homework 3 due at 6 PM** • ***Note: Class will be in Room C08***
	13	12/08/15	Instrumental variables	• Rassen et al. Instrumental variables I: instrumental variables exploit natural variation

Theme		Date	Topic	Readings and Assignments
				in nonexperimental data to estimate causal relationships. J *Clin Epidemiol*. 2009:62:1226-32 • Glymour et al Does childhood schooling affect old age memory or mental status? Using state schooling laws as natural experiments. *J Epidemiol Community Health.* 2008;62:532-7. • Wong et al. Estimating influenza vaccine effectiveness in community-dwelling elderly patients using the instrumental variable analysis method. *Arch Intern Med*. 2012;172:484-91 • Voight et al. Plasma HDL cholesterol and risk of myocardial infarction: a mendelian randomization study. *Lancet*. 2012:380:572-80. <u>Optional:</u> • Rassen et al. Instrumental variables II: instrumental variable application-in 25 variations, the physician preference generally was strong and reduced covariate imbalance. *J Clin Epidemiol* 2009:62:1233-41. • **Worksheet 9 due at 6 PM** • **Homework 4 due on 5/11 at 11:59 PM**
	14	12/15/15	Final review	Come prepared to ask questions
	15	12/22/15	No class	Take home FINAL DUE at midnight

For additional information on the academic calendar, please see:
http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Registrar/Fall-2015-Academic-CalendarRev.pdf?ext=.pdf

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 823: Epidemiologic Methods IV: Seminar in Applications of Epidemiologic Methods

3 Credits
Fall 2015

Time and location	6:30 – 8:30 pm, GC, Room 3317
Instructor	C Mary Schooling, PhD Email: mschooli@hunter.cuny.edu Phone: mschooli@hunter.cuny.edu
Office hours	Tuesday, 4-6pm Room 545, 2180 Third Avenue, New York or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This seminar is intended to help students integrate the concepts and methods of epidemiologic research with specific inquiry directed at understanding and improving the health of urban populations. This seminar requires students to develop proposals for epidemiologic research, identify strategies for data analysis that incorporate the lessons learned in Epidemiology Methods courses, and to examine the application of those strategies to existing research. This course helps to "bring together" the epidemiology theory and methods that have been discussed throughout the rest of curriculum to the particular exigencies of public health research.
Course prerequisites	PUBH 82200
Course format	Lectures and seminar
Required reading and resources	Modern Epidemiology, Rothman, Lash & Greenland, Lippincott Williams & Wilkins J Pearl, Causality, Models, Reasoning, and Inference Cambridge University Press
Suggested reading and resources	Please see course schedule for week by week readings

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Design and implement research projects that: a. Quantify health and the burden of disease in populations b. Perform surveys and risk factor analyses c. Apply causal inference to study design, study implementation and data analysis; d. Identify vulnerable populations and their attributes; apply rigorous methods to examine and monitor health disparities. e. Identify effective interventions to improve population health equitably f. Evaluate the effectiveness of interventions designed to improve population health g. Give appropriate attention to the potential for bias, as well as exposure and outcome measurement issues.	1. Describe the strengths, weaknesses and inconsistencies of the prevailing methodological paradigm in epidemiology. a. Explain the role of risk factors in DAGs 2. Discuss the role of science in epidemiology 3. Distinguish between methods aimed at description, risk stratification and causal inference 4. Explain the value of representativeness for each question 5. Identify possible reasons for conflicting results across published quantitative studies. 6. Compare and contrast research findings, and make public health decisions based on available evidence, even if it is incomplete. 7. Determine what further work is needed to adequately answer research question and make public health/health decisions. 8. Explain the difference between operationalizing a research question in existing data and designing a study to answer a particular research question 9. Interpret a meta-analysis, explain the relevance to interpretation of a single study 10. Compare and contrasts the use of experimental vs. observational study designs 11. Summarize and present data to peers 12. Place instrumental variable studies and natural experiments, including discontinuities, within the pyramid of evidence. Describe how to conduct and interpret such studies. 13. Recap on the biases to which traditional observational studies are open and explain the different ways of addressing them, such as propensity scores and inverse probability weighting 14. Interpret a marginal structural model 15. Explain the use of g-estimation	1. Reaction paper 1, 2 2. Reaction paper 2 3. Session 3 discussion, reaction paper 4 and practical 1 4. Reaction paper 3 5. Paper 1 6. Paper 2 7. Research proposal 8. Research proposal 9. Reaction paper 7 10. Reaction paper 5 11. Presentation 1 and 2 12. Session 12 and Practical 2 13. Reaction paper 6 14. Reaction paper 8 15. Reaction paper 9

Course Assessments

This course will be assessed based on reaction papers (9), papers (2), practicals (2), a proposal and participation. The reaction paper should synthesize and critically evaluate key theoretical, methodological and/or substantive contributions of the readings, along with a few questions for clarification and discussion. This may consist of identifying questions that the readings provoke; critiquing problematic assumptions, logic, and measurement; discussing theoretical and empirical advances; and considering ideas for future directions. The papers should give a thorough exposition of the topic with particular attention to the interpretation of any findings and the implications for public health. The proposal should be in NIH format. Please reference all statements of fact. Please format as single-spaced, typed, 12-point Times Roman font with 1-inch margins. Expected length is 1-2 pages for reaction papers and 5-10 pages for papers and the proposal. Each presentation should last about 10 minutes.

Grading

In general papers and presentation will be evaluated according to their demonstration of a) grasp of the topic, b) identification of the key points, c) synthesis of the material, and d) explanation of the implications for practice. Participation will be evaluated according to contribution to the discussion. Practicals will be evaluated against a standard answer.

Grading rubrics for the assessments

GRADING RUBRICS	(A+ to A-)	(B+ to B-)	(C+ to C)	(F)
Reaction papers, papers, presentations	Provides a comprehensive synthesis of the topic with appropriate examples and discussion of their implications for practice	Identifies the implications of the key points in the topic, provides some examples and relevance to practise	Describes the main concepts in the topic	Inability to identify and describe the main concepts

The relative weight of each course component is as follows:

Assessment	Weight
Reaction papers 9	27%
Practicals 2	15%
Presentation 2	10%
Papers 2	18%
Participation	5%
Proposal	20%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation
All members of the class are expected to actively participate in class activities and discussions, and to complete assigned reading prior to class. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible.

Late/incomplete submission of assignments
All assignments must be submitted to me via blackboard by 4PM on the day of the class. It is expected that your writing will be of graduate-level quality, presented in a readable and consistent manner: 1.5-spaced, typewritten, with one-inch margins all around and proofread. Assignments handed in after the due date without prior permission may not be accepted. If you anticipate the need to turn in work late, please contact me to negotiate a mutually acceptable submission plan in advance of the assignment's due date. Please do not ask for an extension on the due date of the assignment.

Make-ups, rewrites, and extra credit
Rewrites are permitted for reaction papers.

Expectations of students
Students are required to attend each class, as participation in the discussion is essential to understanding the existing evidence on the topic and drawing judgments. In the case of illness, students should email me the day of class. In the case of unavoidable absence (e.g. work related conference), students should email me one week prior to the class. Students should prepare adequately for class, and participate appropriately. Appropriate participation includes:

- Active listening
- Building on what others say
- Staying focused on the topic of the session
- Clarifying the assumptions underlying opinions/statements
- Using the readings and epidemiologic ideas to develop arguments
- Constructively challenging the ideas of others, rather than accepting statements that are inadequately supported
- Allowing others to request explanation when needed
- Coming prepared, rather than relying on the group to explain difficult topics

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Expectations for the instructor

Students can expect the instructor to provide access to the week-by-week readings (on blackboard), to provide substantial background information at each session (apart from practicals) as powerpoints available shortly after each session, and to facilitate discussion. Students can expect reaction papers to be graded within 1 week and other assignments to be graded within 2 weeks.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Last Updated July 23, 2015

Course Schedule

This schedule & assignments are subject to change throughout the semester. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. Opportunities for group work will be scheduled during some sessions.

Session	Date	Topic	Readings	Assignment Due
1	**28 Aug**	Current paradigms in epidemiology – the dispute	1. Chapter 1, Modern Epidemiology, Rothman, Lash & Greenland 2. Chapter 1, Causality, Pearl 3. https://epiresearch.org/about-us/archives/video-archives-2/the-scientific-approach-to-causal-inference/ 4. Int J Epidemiol. 1975 Sep;4(3):159-68. Popper's philosophy for epidemiologists. Buck C. 5. Am J Epidemiol. 2012 Dec 15;176(12):1071-7. Stories from the evolution of guidelines for causal inference in epidemiologic associations: 1953-1965. Blackburn H, Labarthe D.	Reaction paper 1 Identify the major differences between the approach of Pearl compared with that of Rothman and Rubin
2	**1 Sept**	Current paradigms in epidemiology – the implications	1. Chapter 1, Modern Epidemiology, Rothman, Lash & Greenland 2. Chapter 1, Causality, Pearl **3.** Phillips CV, Goodman KJ. Causal criteria and counterfactuals; nothing more (or less) than scientific common sense. Emerg Themes Epidemiol. 2006 May 26;3:5. 4. Pearl J, On the consistency rule in causal inference: axiom, definition, assumption, or theorem? .Epidemiology. 2010 Nov;21(6):872-5. 5. Cole SR, Frangakis CE. The consistency statement in causal inference: a definition or an assumption? Epidemiology. 2009 Jan;20(1):3-5.	Reaction paper 2 Describe the implications of the differences between these approaches
3	**8 Sept**	Data generating models and DAGs	1. Chapter 1, Causality, Pearl 2. Series on representativeness in August 2013 IJE and responses in Jan 2014	Reaction paper 3 1. Give an example of a data generating model and explain how to test it 2. Explain how risk factors relate to DAGs 3. Explain when representativeness is required for testing a model
4	**29 Sept**	Model generation The problem of induction, does big data help?	1. Andrew Gelman, Guido Imbens, Why ask Why? Forward Causal Inference and Reverse Causal Questions, NBER Working Paper No. 19614, Issued in November 2013 The problem of induction, does big data help? 2. Jordan B.Genes and non-mendelian diseases: dealing with complexity. Perspect Biol Med. 2014 Winter;57(1):118-31.	Reaction paper 4. 1. What is the difference between causes of effects and effects of causes 2. How does big data help us address these questions
5	**6 Oct**	Model generation EWAS and GWAS	1. Patel CJ, Rehkopf DH, Leppert JT, Bortz WM, Cullen MR, Chertow GM, Ioannidis JP Systematic evaluation of environmental and behavioural factors associated with all-cause mortality in the United States National Health and Nutrition Examination Survey. Int J Epidemiol. 2013 Dec;42(6):1795-810	Reaction paper 5 What can we learn from EWAS and GWAS?

			2. Patel CJ, Cullen MR, Ioannidis JP, Butte AJ. Int J Epidemiol. 2012 Jun;41(3):828-43. Systematic evaluation of environmental factors: persistent pollutants and nutrients correlated with serum lipid levels. 3. Int J Epidemiol. 2012 Jun;41(3):843-6.Commentary: a step towards more comprehensive analyses of life course effects of mixtures of environmental factors. Porta M, Gasull M, Pumarega J. 4. Pendergrass SA, Verma A, Okula A, Hall MA, Crawford DC, Ritchie MD. Phenome-Wide Association Studies: Embracing Complexity for Discovery. Hum Hered. 2015;79(3-4):111-23.	
6	**13 Oct**	EWAS practical		Prepare data for use in practical
7	**20 Oct**	BMI and mortality	1. Association of all-cause mortality with overweight and obesity using standard body mass index categories: a systematic review and meta-analysis. Flegal KM, Kit BK, Orpana H, Graubard BI.JAMA. 2013 Jan 2;309(1):71-82 2. Obesity, physical activity, and mortality in a prospective chinese elderly cohort. Schooling CM, Lam TH, Li ZB, Ho SY, Chan WM, Ho KS, Tham MK, Cowling BJ, Leung GM. Arch Intern Med. 2006 Jul 24;166(14):1498-504. 3. Flegal KM et al.Reverse causation and illness-related weight loss in observational studies of body weight and mortality. Am J Epidemiology 2011;173(1):1-9. 4. Cooper RS. Which factors confound or modify the relationship between body weight and mortality? Int J Obesity 2008; 32:S47-S51. 5. Zajacova A et al. Overweight adults have the lowest mortality: do they have the best health? Am J Epidemiology 2011;173:430-437. 6. Alley DE et al. Changes in weight at the end of life: characterizing weight loss by time to death in a cohort study of older men. Am J Epidemiology 2010;172:558-565. 7. BMJ. 2009 Dec 22;339:b5043. The association between BMI and mortality using offspring BMI as an indicator of own BMI: large intergenerational mortality study. Davey Smith G, Sterne JA, Fraser A, Tynelius P, Lawlor DA, Rasmussen F. **8.** Flanders WD, Eldridge RC, McClellan W. Epidemiology. 2014 Sep;25(5):762-4. A nearly unavoidable mechanism for collider bias with index-event studies.	Practical results 1 (EWAS) Paper 1: BMI and mortality
8	**27 Oct**	Causal inference from observational evidence	1. Tatsioni A, Bonitsis NG, Ioannidis JP. Persistence of contradicted claims in the literature ***JAMA***. 2007 Dec 5;298(21):2517-26.. 2. Benson K., Hartz A.J. A comparison of observational studies and randomized, controlled trials. ***N Engl J Med*** 2000; **342**:1878-1886. 3. Concato J., Shah N., Horwitz R.I. Randomized, controlled trials, observational studies, and the hierarchy of research designs. ***N Engl J Med*** 2000; **342**:1887-1892. 4. Prasad V., Jorgenson J., Ioannidis J.P., Cifu A. Observational studies often make clinical practice recommendations: an empirical evaluation of authors' attitudes***. J Clin Epidemiol*** 2013; **66**:361-366. 5. Pearl J. Invited commentary: understanding bias amplification. Am J Epidemiol. 2011 Dec 1;174(11):1223-7; 6. Austin PC, Stuart EA. Moving towards best practice when using inverse probability of treatment weighting (IPTW) using the propensity score to estimate causal treatment effects in observational studies. Stat Med. 2015 Aug 3.	Presentation 1 Present an example where observational evidence was refuted by experimental evidence. Explain specifically how the discrepancy between these different sources of evidence arose (do not use HRT as an example)

9	**3 nov**	Instrumental variable analysis	1. Swanson SA, Hernán MA. Commentary: how to report instrumental variable analyses (suggestions welcome). Epidemiology. 2013 May;24(3):370-4. 2. VanderWeele TJ1, Tchetgen Tchetgen EJ, Cornelis M, Kraft P.Methodological challenges in mendelian randomization. Epidemiology. 2014 May;25(3):427-35.	Reaction paper 6: How does IV analysis compare with conventional regression?
10	**10 Nov**	MR practical	1. Burgess S, Scott RA, Timpson NJ, Davey Smith G, Thompson SG; EPIC- InterAct Consortium.Using published data in Mendelian randomization: a blueprint for efficient identification of causal risk factors. Eur J Epidemiol. 2015 Jul;30(7):543-52. 2. Ahmad OS et al. A Mendelian randomization study of the effect of type-2 diabetes on coronary heart disease. Nat Commun. 2015 May 28;6:7060.	Prepare data for use in practical
11	**17 Nov**	Interpreting the observational evidence, natural experiments and discontinuities	1. Callaghan RC, Sanches M, Gatley JM Impacts of the minimum legal drinking age legislation on in-patient morbidity in Canada, 1997-2007: a regression-discontinuity approach. Addiction. 2013 Sep;108(9):1590-600 2. Albouy V, Lequien L.. Does compulsory education lower mortality? J Health Econ. 2009 Jan;28(1):155-68 3. Aidan G O'Keeffe, Sara Geneletti, Gianluca Baio, Linda D Sharples, Irwin Nazareth, and Irene Petersen, Regression discontinuity designs: an approach to the evaluation of treatment efficacy in primary care using observational data, BMJ sept 2014	Practical results (MR)
12	**24 Nov**	Meta-analysis and the pyramid of evidence	1. Umscheid CA Clin Infect Dis. 2013 Sep;57(5):725-34. A Primer on Performing Systematic Reviews and Meta-analyses.. 2. Tugwell P, Judd MG, Fries JF, Singh G, Wells GA: Powering our way to the elusive side effect: a composite outcome 'basket' of predefined designated endpoints in each organ system should be included in all controlled trials. J Clin Epidemiol 2005, 58:785–790. 3. Gøtzsche PC1, Ioannidis JP Content area experts as authors: helpful or harmful for systematic reviews and meta-analyses?. BMJ. 2012 Nov 1;345:e7031. 4. Ioannidis JP, Chang CQ, Lam TK, Schully SD, Khoury MJ. The geometric increase in meta-analyses from China in the genomic era. PLoS One. 2013 Jun 12;8(6):e65602. 5. Doshi P1, Dickersin K, Healy D, Vedula SS, Jefferson T. Restoring invisible and abandoned trials: a call for people to publish the findings. BMJ. 2013 Jun 13;346:f2865	Reaction paper 7 Paper 2: Describe a healthy diet
13	**1 Dec**	Marginal structural models	1. Suarez D1, Borràs R, Basagaña X..Differences between marginal structural models and conventional models in their exposure effect estimates: a systematic review. Epidemiology. 2011 Jul;22(4):586-8 2. Neophytou AM, Costello S, Brown DM, Picciotto S, Noth EM, Hammond SK, Cullen MR, Eisen EA. Marginal Structural Models in Occupational Epidemiology: Application in a Study of Ischemic Heart Disease Incidence and PM2.5 in the US Aluminum Industry. Am J Epidemiol. 2014 Sep 15;180(6):608-15 3. Chen PL, Cole SR, Morrison CS. Epidemiology. 2011 Nov;22(6):877-8. Hormonal contraception and HIV risk: evaluating marginal-structural-model assumptions.	Reaction paper 8: Describe the strengths and weaknesses of MSM
14	**8 Dec**	G estimation	1. Keil AP, Richardson DB, Troester MA., Healthy worker survivor bias in the Colorado Plateau uranium miners cohort., Am J Epidemiol. 2015 May 15;181(10):762-70. 2. Joffe MM. Structural nested models, g-estimation, and the healthy worker effect: the promise (mostly unrealized) and the pitfalls. Epidemiology. 2012 Mar;23(2):220-2. 3. Chevrier J, Picciotto S, Eisen EA. A comparison of standard methods with g-estimation of accelerated failure-time models to address the healthy-worker survivor effect: application in a cohort of autoworkers exposed to metalworking fluids. Epidemiology. 2012 Mar;23(2):212-9.	Reaction paper 9: Describe the strengths and weaknesses of g-estimation
15	**15 Dec**	Proposal		Presentation 2

		presentation		Present research proposal Research proposal

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CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 825: Applied Biostatistics II
3 Credits
Fall 2015

Time and location	Silberman room C-06
Instructor	Levi Waldron, B.Sc., M.Sc., Ph.D. Best way to contact: levi.waldron@hunter.cuny.edu
Office hours	By appointment (www.calendly.com/lwaldron to schedule an appointment.)
Course website	https://bbhosted.cuny.edu/webapps/blackboard/execute/launcher?type=Course&id=_1185885_1&url=
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course is designed to expand on the biostatistical methods covered in Applied Biostatistics I to deepen the analytic repertoire of students with respect to regression modeling through the introduction of loglinear and generalized linear models including Poisson and Negative Binomial regressions as well as introduce techniques for analysis of longitudinal data including random and mixed effect models, and survival analysis.
Course prerequisites	PUBH 82400
Course format	Hybrid: all classes available in person or online.
Required reading and resources	none
Suggested reading and resources	Vittinghoff E, Glidden DV, Shiboski SC, McCulloch CE. Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models (Statistics for Biology and Health). Springer; 2005.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Determine the influence of social, cultural, historical, behavioral and biological factors in population health.	• Describe the assumptions necessary for statistical inference in generalized linear models, especially for regression models and models of count data • Describe the assumptions necessary for statistical inference in a repeated measures setting, both for traditional methods as well as random and mixed effects models • Recognize inherent limitations in both the data under study as well as the statistical method used to analyze the data	• Assignments 1-4
3. Design and implement research projects that a. Quantify health and the burden of disease in populations b. Perform surveys and risk factor analyses c. Apply causal inference to study design, study implementation and data analysis; d. Identify vulnerable populations and their attributes; apply rigorous methods to examine and monitor health disparities. e. Identify effective interventions to improve population health	• Explain censoring and recognize when it is appropriate to utilize Survival Analysis methods • Recognize connection and difference between Poisson and Negative Binomial regressions • Apply random and mixed effects models to account for within and between subject correlations. • Identify potential for over-fitting, develop and assess regression models in such situations appropriately. • Apply and interpret Poisson and Negative Binomial regression models, Cox	• Assignments 1-4 • Oral presentation of one assignment

equitably f. Evaluate the effectiveness of interventions designed to improve population health g. Give appropriate attention to the potential for bias, as well as exposure and outcome measurement issues.	Proportional Hazard models, Linear Mixed Effects models, and Penalized Regression • Assess model fit and modifying the models as well as finding alternatives when appropriate • Interpret computer output from Poisson and Negative Binomial regression models, Proportional Hazard models and Linear Mixed Effects models • Orally present your findings clearly and effectively • Incorporate feedback into improved data analysis report after in class “peer review” • Produce concise, readable, and cohesive data analysis reports • Create appropriate tables and figures that adequately convey the key points of statistical analysis	

Course Assessments

Your understanding of the course material will be evaluated through a total of four (4) data analysis reports. Each student will be expected to present draft results in class and actively participate in the constructive critique/review of the work of his/her peers. You will have the chance to revise and resubmit each report after the first round of critique/review. This will give you the chance to deepen your analysis and bolster your mastery of the statistical methods.

Grading

Evaluation criteria

Rubrics provided with each assignment. Participation is based on handing in a rough draft of each assignment on time, effort put into presentation, and feedback provided through discussion forums and during presentations.

The relative weight of each course component is as follows:

Assessment	Weight
Assignment 1	20%
Assignment 2	20%
Assignment 3	20%
Assignment 4	20%
Participation	20%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty

generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Participation will be assessed based on your project presentation, and ongoing participation in class and / or online discussion. You are required to be in class on the first day and on the one when you are presenting.

Late/incomplete submission of assignments

All projects will have a specific due date and will be returned to students within 7 days. Late homeworks will be penalized by deducting 10% from the earned grade per day, with no credit after 5 days unless prior arrangements for extenuating circumstances are made.

Make-ups, rewrites, and extra credit

Make-up assignments will be provided only under exceptional circumstances. In this case, the final grade will be the average of grades for the original and make-up assignments.

Expectations of students

Students are expected to attend every class either online or in person, and to attend in person on the day they are presenting. It is encouraged for students to help each other in figuring out how to do assignments, and to share pieces of code, however the work you hand in must be primarily your own, and any borrowed code must be attributed to its author. Students are expected to participate in class discussions or online discussions, whether attending online or in person.

Expectations for the instructor

The instructor will be available for help through the online discussion forum, and by appointment (www.calendly.com/lwaldron to book an appointment). Appointments may be in person in room 538 of the Silberman building, by phone, or by Skype/Hangout. Students can expect an welcoming and respectful learning environment.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

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Course Schedule

The following schedule is subject to change (last updated: August 31, 2015).

For key dates regarding withdrawals etc, see:
http://www.cuny.edu/academics/calendars/fall-2015.html

Session	Date	Topic	Suggested reading
1	9/2 in-class attendance mandatory	**Introduction** • Review of syllabus • Review of linear and logistic regression • Introduction to R (time permitting)	4.1 - 4.6 5.1 – 5.3
2	9/9	**Generalized linear model (GLM)** • Analysis of variance and deviance table • Residual analysis • Multicollinearity	4.7 5.4 – 5.6
3	9/16	**Report 1: First Submission + Presentations and Critique**	
4	9/30	**Loglinear Models** • Analysis of multi-way contingency tables • Poisson regression for count data • Loglinear models as special case GLM **Report 1: Final Resubmission**	8.1-8.3
5	10/7	**Loglinear Models** • Negative Binomial regression for count data • Residual analysis and model diagnostics	4.2
6	**10/14**	**Report 2: First Submission + Presentations and Critique**	
7	10/21	**Basic Methods for Survival Analysis** • Life tables • Kaplan-Meier curves • Log-rank test **Report 2: Final Resubmission**	3.5, 6.1
8	10/28	**Cox Proportional Hazards Model** • Model specification • Residual Analysis	6.2, 6.4
9	11/4	**Extending the Cox Regression Model** • Stratification • Time-varying covariates • C-statistic for evaluating survival models	6.3
10	11/11	**Report 3: First Submission + Presentations and Critique**	
11	11/18	**Longitudinal Data** • Basic methods for longitudinal data • Covariance structures	7.1-7.5

		• Linear Mixed Effects Models • Variance components • Random intercept models **Report 3: Final Resubmission**	
12	11/25	**Multilevel/Hierarchical Modeling** • Random effects models • Extensions	handouts
13	12/2	**Advanced model assessment** • Cross-validation • ROC plots • Alternative measures of goodness of fit	handouts
14	12/9	**Report 4: First Submission + Presentations and Critique**	
15	12/23	**Regression with many variables** • Exploratory methods • Bias-variance tradeoff • Over-fitting • Penalized likelihood regression **Report 4: Final Resubmission**	handouts

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 830: Emerging Issues in Environmental and Occupational Health
3 Credits
Fall 2015

Time and location	Class meets from 4:15-6:15 pm, Room 4433, CUNY Graduate Center, 365 5th Avenue, New York, NY
Instructor	Prof Jean Grassman, MS, PhD, CPH grassman@brooklyn.cuny.edu 718-951-5000 x2752; 646-594-0476
Office hours	Wednesdays 3:30-4 pm; 6:30-7 pm or by appointment
Course website	**Fall 2015 Emerging issues in EOH PUBH 83000 28948 (Graduate Center)** Log into Blackboard at https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course examines the impact of macro-level trends – such as corporate globalization, immigration patterns, and technological development – on the urban physical environment. It focuses on the relationship between the urban infrastructure (e.g., housing, transportation, sewage and waste disposal) and environmental media (e.g., air quality, water quality and land use). This course also examines the impact of macro-level trends on occupational health and safety conditions, focusing on such issues as outsourcing of manufacturing jobs to developing nations, the rise in the service and informal economies, immigrant labor, de-unionization, the new working class and the loss of the safety net. It examines the effectiveness of current policies in addressing these problems. Through focused readings and in-depth examination of case studies, students develop the tools for analyzing how macro-social trends affect the urban physical environment, workplaces and health. Teams of students then analyze an environmental and occupational issue, illustrate how it affects urban communities, and develop solutions to reduce Environmental and Occupational Health burdens.
Course prerequisites	N/A
Course format	The course holds weekly face to face meetings. The first three sessions will be face to face lecture/discussions. Subsequent sessions will consist of an hour of lectures given by either by guest speakers or student presentations (weeks 4, 10, and 15) followed by

	a one hour analysis discussion.
Required reading and resources	Weekly readings are available on Blackboard
Suggested reading and resources	Howard Frumkin *Environmental Health: From Global to Local. 2nd Edition.* Jossey-Bass; (February 8, 2010) ISBN-10: 0470404876; ISBN-13: 978-0470404874. Barry S. Levy, David H. Wegman, Sherry L. Baron, Rosemary K. Sokas. *Occupational and Environmental Health: Recognizing and Preventing Disease and Injury. 6th Edition.* Oxford. ISBN-10: 01295397886 ISBN-13: 978-019539788

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Assess and analyze the influence of infrastructure (e.g., transportation, water supply and waste disposal systems and the built environment), global influences (e.g. climate change, energy use), and macro-social trends (e.g., affecting labor practices, immigration, and regulatory oversight) in creating or mitigating environmental and occupational health hazards.	Identify and assess physical, organizational, and global sources of emerging EOH problems. Identify technical and political strategies which are needed to address these emerging hazards.	• AM5, AM7, AM8 • AM5, AM8
2. Identify and quantify the toxicological, physical, behavioral and susceptibility factors contributing to environmentally and occupationally-related illness and how these factors interact within the environment.	Identify and assess the manner in which emerging environmental and occupational problems affect health	• AM5, AM7, AM8
3. Explain the impact of occupational and environmental hazards in a manner appropriate to the target audience including students and professionals and	Communicate orally to a variety of audiences. Communicate in writing to a variety of audiences Gain competence in understanding the range of concerns encompassed by EOH	• AM5; AM8 • AM6; AM9 • AM1-9
7. Demonstrate the leadership and teamwork skills appropriate for working with students, health professionals and regulators in developing strategies for controlling occupational and environmental hazards	Develop leadership, collaborative, and teamwork skills.	• AM7

Course Assessments
All written assignments of the course should be submitted via Blackboard. Presentations will take place during the scheduled class hours.

AM1. & AM2. Preliminary speaker topic summary
Beginning in October, we will be covering about 10 emerging issue topics presented by EOH specialists. You will select two of them as subjects of brief written summaries (1-2 pages) on the state of knowledge on the topic. Additional guidelines will be distributed in September.

- The summaries will be due on the day of the presentation (October- December)
- Each of the 2 assignments is worth 5%

AM3. & AM4.Post presentation speaker summary
The post presentation topic summary covers the main points presented by the speaker and identifies gaps and strengths in their presentation. These summaries will form the basis of discussion in the "recap" taking place the week after the presentation. Additional guidelines will be distributed in September. The post presentation topic summary will be due by class time the week after the presentation (or when the class next meets).

- The summaries will be due one week after the day of the presentation (October-December)
- Each of the 2 assignments is worth 5%

AM5. Emerging issue brief in your area of expertise
An emerging issue that is not sufficiently recognized or understood as an environmental health problem in your area of expertise will form the basis for a written scientific brief. A brief is a "concise statement or summary" that can be used to quickly familiarize others with the essential elements of a problem. In this instance, the others are your classmates.

The text of your brief should be at least two but no more than three double-spaced pages plus an additional page for references. The brief should identify the emerging issue, state how it relates to your area of EOH expertise, justify why it can be considered an important emerging issue, summarize what is known and not known about its' potential impact on human health, suggest how it might be evaluated to determine whether there is a need for further action. Suggest one key source of information on the topic.The brief you submit will be posted in the Week 4 folder on Blackboard.

- Submit your topic and 1-2 key references by September 23
- Submit written brief by October 7
- Worth 10%

AM6. Emerging issue class presentation on topic in your area of expertise
You'll prepare a 15 minute presentation on your selected emerging issue that parallels the structure of the brief. The structure of your allotted 15 minutes should include a 10

minute talk and 5 minutes of structured questions. The time limit of 15 minutes for the presentation will be strictly enforced.

You should support your talk with images/text from either Powerpoint or Prezi. Understand that the projected images/text should highlight and expand the impact of your presentation and not simply substitute for notes. The presentation will be graded for the accuracy of content, organization, and effectiveness in conveying the topic. The presentation will be posted in the Week 4 folder on Blackboard.

- Class presentation on September 30
- Worth 10%

AM7. Group presentation on an emerging EOH issue
Students will divide into three groups and asked to mutually select an emerging issue. The chosen issue should clearly fall within one of the following areas: Toxicology, Occupational Health, Environmental health, Global OEH. The presentation should include the following: clearly describe the emerging issue, how it was identified, who it affects, why it is important, and address possible responses. Each team member should participate in delivering the presentation to the class. Presentations should not exceed 15 minutes.

- Submit topic by October 21
- Class presentation on November 4
- Worth 20%

AM8. Emerging issues term paper outside area of expertise
You will be writing a 10-15 page paper on an under-recognized (*aka* new, overlooked or underappreciated) aspect of an emerging environmental or occupational health issue. You should choose a topic that is outside your area of expertise. In addition, it should include one of the following features:

- recent occurrence;
- more widespread distribution than previously recognized;
- health effects that are different or more severe than previously recognized;
- previously unrecognized vulnerable populations.

Examples of emerging issues will be provided but keep in mind you'll need to support the under-recognized aspect of your chosen topic. As an example, childhood exposure to lead is acknowledged to have an adverse on children's cognition and would not be considered an appropriate basis for your paper. In contrast, the relationship between body burden of lead and declining cognitive function in aging women would be acceptable as an under-recognized emerging issue. Additional details on the paper will be distributed on Blackboard by Week 5 of the class.

- Topic proposal due with 1-2 key references by November 25 (1 page)
- Draft paper due by December 2 (option for revision)
- Final paper due by December 16
- Worth 25%

AM9. Emerging issue presentation outside area of expertise
For the last class, your presentation on your chosen emerging issue topic will take the form of a TED talk. The presentation should be no longer than 12 minutes. The last slide should pose a question that stimulates discussion and be based on a key uncertainty about the emerging issue. Additional details on the presentation will be distributed on Blackboard by Week 5 of the class.

TED talks on how to do TED talks:
https://unknowntoexpert.com/public-speaking/top-5-tedtalks-give-great-ted-talk/

- Class presentation on December 16
- Worth 15%

Grading

Evaluation criteria

The course grade will be based on the 9 assessments listed below. A written description of each assessment is available on Blackboard. A grading rubric will be provided 2-3 weeks in advance for each type of assessment.

Assessment	Weight:
AM1. & AM2. Preliminary speaker topic summary (n=2; 5% each)	10%
AM3. & AM4. Post presentation speaker summary (n=2; 5% each)	10%
AM5. Emerging issue brief in area of expertise	10%
AM6. Emerging issue class presentation in area of expertise	10%
AM7. Group presentation on an emerging EOH issue	20%
AM8. Emerging issues term paper outside area of expertise	25%
AM9. Emerging issue presentation outside area of expertise	15%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation
Success in the course depends on preparation, participation, and engagement. Students should attend class, do the readings, be prepared to initiate and participate in class discussions, prepare oral presentations, collaborate with other students, and submit assignments by their due date.

Since there are only 15 sessions in the semester, timely and regular attendance is essential. If you anticipate missing a class, please let the instructor know ahead of time so that accommodations may be made.

Unless stated otherwise, required and recommended readings will be posted on Blackboard (except for the recommended Frumkin text). For course discussion purposes, you may also be asked to bring paper copies of your assignments to class.

Late/incomplete submission of assignments
Assignments are due by class time on the day indicated in section on grading policies. Assignments should be submitted electronically to Blackboard

Upon request, written assignments, except for Draft 1 of the final term paper, can be granted an extension of 1 week. Draft 1 of the final term paper needs to be submitted on the scheduled date so that the final version of the term paper can be completed by the end of the semester.

Make-ups, rewrites, and extra credit

A revision option has been built into the assignment for the semester term paper. Note that the opportunity for revision is contingent upon submission of the term paper by the due date; no extension will be given.

The three class presentations need to be delivered to class on the scheduled day. Due to the schedule of the course, there will be no opportunity for make up.

This course does not include extra credit assignments.

Expectations of students

Students are expected to do the readings, assignments, attend class, and participate in class discussions.

Expectations for the instructor

The instructor will be available for consultation in room 3317 during office hours. Instructor will respond to emails within 24 hours. Required readings will be made available at least one week prior to class.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule
The course schedule shown below is subject to change throughout the semester. Note that the header of the syllabus provides the version date. Please check your version date to ensure that we are using the most recent version.

The Graduate Center Academic Calendar can be accessed at http://www.gc.cuny.edu/Public-Programming/Calendar/Academic-Calendar-2015-16
The deadline is dropping courses is September 16.

Conceptually, emerging issues will be broken into four areas:
- Toxicology
- Occupational exposure&health (OE&H)
- Environmental exposure&health (EE&H)
- Global OEH (Global)

Overview of class sessions (subject to revision)

Session	Date	Area	Topic • Speaker(s)	Assignment Due
1	9/2	Introduction	Introduction-What constitutes an emerging issue? • Grassman	
2	9/9	Toxicology	Biological response to toxicants • Grassman	
3	9/16	Toxicology	Determinants and modifiers of exposure • Grassman	
	9/23		No class	AM5 topic/refs
4	9/30	Varied	Emerging issues in area of expertise • PH830 students	AM5, AM6
5	10/7	EE&H	Geogenic Arsenic in Private Well Water: A Global Perspective • Prof Yan Zheng, CUNY SPH; Queens College, Center for the Biology of Natural Systems, Graduate Center	AM1
6	10/14	OE&H/EE&H	OEH and social disparities • Prof. Sherry Baron, CUNY SPH, Queens College, Center for the Biology of Natural Systems	AM1-3
7	10/21	OE&H	Documentation of emerged Issues for chemical hazard risk assessment in occupational and community settings: Particulate Pollution, Silica, Asbestos, and Pesticides • Prof Franklin Mirer, CUNY SPH; Hunter	AM1-4, AM7 topic

			College, Graduate Center	
8	10/28	EE&H/ OE&H	Corporate influence on environmental & occupational health policy Prof Gerald Markowitz, CUNY SPH; John Jay College; Graduate Center	AM1-4,
9	11/4	EE&H/ OE&H	*(Surveillance of workers for chronic illness)* • Prof Steven Markowitz, CUNY SPH; Queens College, Barry Commoner Center for Health and the Environment, Graduate Center	AM1-4, AM7
10	11/11	EE&H	*(Regulatory policy for hydraulic fracturing)* • Prof. Liz Geltman, CUNY SPH; Hunter College, Graduate Center • Emerging Issues Group Presentations	AM1-4
11	11/18	OE&H	TBA • Prof Lew Pepper, Queens College, Barry Commoner Center for Health and the Environment, Graduate Center	AM1-4
		Global	*(Assessment of hazardous waste sites around the globe)* • Prof Jack Caravanos, Hunter College	
12	11/25	EE&H	GIS in environmental health • Prof Andrew Maroko, CUNY SPH; Lehman College, Graduate Center	AM1-4, AM8 proposal
13	12/2	EE&H/OE&H	Social context in exposure assessment • Prof Grace Sembajwe, CUNY SPH; Hunter College, Graduate Center	AM1-4; AM8 draft (optional)
14	12/9	OE&H	Occupational exposure to cooking fume • Prof. Brian Pavilonis, CUNY SPH, Hunter College	AM1-4
15	12/16	Varies	Emerging Issues 2015 (outside your area of expertise) • PH830 student presentations	AM4, AM8 final, AM9

DPH HPM SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

Graduate Center

PUBH 840: Seminar in Health Policy and Management

Fall 2015

3 credits

Catalogue description	The objective of the course is to understand patterns in the organization, financing, and delivery of health care, and their relationship to population-based health outcomes, through an integrated exploration of research from the various disciplines informing the health policy and management fields. With an emphasis on the development of critical thinking skills, students are introduced to multidisciplinary models from the social sciences as conceptual sources for health policy and management research. The course adapts an interdisciplinary approach to the examination of important topics in urban public health management and policy, such as the relationship between health systems and the urban-based health economy, and the interface between managerial functions and health policy analysis in addressing health status and outcomes disparities.
Pre-requisites	N/A
Course meets	Graduate Center Room 3310A, Tues 4:15-6:15pm
Instructors	Betsy Eastwood, Ph.D.; Alexis Pozen, Ph.D.
Email	eastwood@brooklyn.cuny.edu; alexis.pozen@sph.cuny.edu
Phone	718-951-5000 x2755 (Betsy); 646-664-8361 (Alexis)
Office	5129 Ingersoll Hall, Brooklyn College (Betsy); 555 W 57th St, Room 1145 (Alexis)
Office hours	By appointment
Required books	Oberlander, J. *The political life of Medicare.* Chicago: U Chicago Press, 2003 McDonough, J. *Inside National Health Reform.* New York: Milbank, 2011 Starr, P. *Remedy and Reaction: The Peculiar American Struggle for Health Care Reform.* New Haven: Yale, 2011 Engel, J. *Poor People's Medicine: Medicaid and American Charity Care since 1965.* Durham, NC: Duke U Press, 2006. Cutler, DM. *Your Money or your life: strong medicine for America's health care system.* New York: Oxford University Press, 2004.
Recommended books	Starr, P. *The social transformation of American medicine*. New York: Basic Books, 1984
	Other readings will be posted on Blackboard or for Web based readings, via link to the URL. PL111-148, the Patient Protection and Affordable Care Act of 2010, is on Blackboard following the weekly session material.

Assessment

Your understanding of the course material will be evaluated through class participation, in class presentations, and papers

Assignment 1 will be a class presentation regarding a contemporary debate around one of the major titles of the PPACA (PL111-148)

Assignment 2 will be a policy analysis of new structures created by the ACA and their progress to date (e.g., accountable care organizations, insurance exchanges, patient-centered medical homes)

Assignment 3 will be an op-ed piece on the policy topic of your choice. Each of these will be the sources for class discussion and debate

Course policies

Grading

		Dates
20%	Assignment 1	10/14
40%	Assignment 2	11/18
20%	Assignment 3	12/9
20%	Class participation	
100%		

Attendance, class participation, lateness and absences

Students are expected to make arrangements to attend each class on time. Absences must be excused beforehand by one of us. Likewise, this is a seminar, and you should come prepared to participate in an informed and meaningful way.

Late submission of assignments

All students in the School of Public Health are very busy. Both to be equitable and to encourage professionalism in meeting deadlines, points will be deducted for each day that an assignment is late. The only exception is if the student has communicated with us ahead of time and if we have approved an extension. Personal illness and severe family problems are usual given positive consideration as reasons for lateness. The press of work in your job or other courses usually is not. Given the wide range of communication options available, there are few if any situations in which it would be impossible for a student to communicate with us in advance.

Class citizenship & rules of conduct

Please turn your cell phones off prior to class. If you have an emergency which warrants your being available to persons outside the class, such as a family emergency, please let us know at the beginning of class. Then, turn your cell phone to silent mode and leave class if you need to take a call. If you bring a laptop/tablet to class with you, please use it ONLY to take notes.

Email correspondence

We ask that when you write to either of us, you include a full descriptive subject line for your emails, since we have an enormous volume of email correspondence each day. We will return your email, generally within one day.

Institutional policies

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

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Grade appeals

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Competency	Course Learning Objectives	Assessment Method
Assess and analyze the impact of public policy interventions within the various domains of public health, the theoretical motivations for undertaking them, the influence of the political, bureaucratic, and social environmental in which policy decisions are made, the consequences of such decisions.	*Explicate ways politics influence the management of health care organizations and how management of health care organizations affects politics*	Discussion, analysis of a Title in the PPACA
Understand and analyze the policy environment for healthcare organizations.	*Utilize and synthesize current policy analytic data to explain current policy circumstances*	Discussion
For healthcare and public health organizations, discuss how each of the following affect organizational behavior and service delivery: organizational structure, motivation and incentives, individual and group behavior, group decision making, quality measurement and improvement, and organizational relations with their environments. Develop interventions to change at least 3 of the above to improve health care and public health service delivery and health outcomes.	*Locate and critically evaluate historical policies and law and apply them to current reform schemes*	Discussion Paper assignment 2
Understand and appropriately apply analytical strategies used in health policy research, such as costing analysis, cost effectiveness and cost benefit analysis	*Determine factors that have contributed to the political success or failure of previous attempts at health reform*	Discussion Assignment 1 and 2
Develop familiarity with and critically analyze federal, state, and municipal laws/regulations and their historical context as relevant to public health management and policy decisions	*Evaluate using stakeholder analysis how Congress able to pass such a large and controversial piece of legislation as the ACA*	Discussion Assignment 1
Formulate alternative options for resolving problems in health policy or management, evaluate their economic, practical, ethical, legal,	Used disciplinary perspectives in HPM – political science, sociology, economics, and/or history to refine policy analysis	Discussion Assignment 2

administrative, and technical feasibility and recommend preferred options based on and supported by your analysis		

Schedule of Sessions

	Date	Topic	Readings and Assignments
1	9/2	Course overview, student and instructor introductions *What is health services research? How do politics influence the management of health care organizations, and how does the management of health care organizations affect politics?*	Burton L. Introduction to health services research. Available at: http://ocw.jhsph.edu/courses/hsre/PDFs/HSRE_lect1_burton.pdf
2	9/9	Medicare *Why is it important to know the history of the passage of Medicare? What can we learn about broader health policy from Medicare reform efforts?*	Oberlander J. (2003) *The Political Life of Medicare.* (Chs 2-3); MEDPAC 2014 Report to the Congress, Chs 1-2
3	9/16	Medicaid/SCHIP *Why was Medicaid structurally and financially different from Medicare? How can Medicaid reform be meaningfully accomplished?*	Engel J. (2006) *Poor People's Medicine* (Chs 1-7)
4	9/23	Health reform (a political history) *What factors have contributed to the political success or failure of previous attempts at health reform?*	Starr P. (2011) *Remedy and Reaction;* skim Chs 1-2, read Chs 3-7
5	9/30	Health reform (ACA) *How was Congress able to pass such a large and controversial piece of legislation as the ACA?*	McDonough J. (2011) *Inside National Health Reform* (Part II; skip Titles VIII-X)
6	10/7	Disciplinary perspectives in HPM – political science, sociology, economics, history *How do different disciplines inform the questions raised in health services research and health policy research?*	Glied S. Mandates and the affordability of health care. Inquiry 2009; 46(2): 203-214. McGuire, T, Newhouse, JP, and Sinaiko, AD. An economic history of Medicare Part C. *Milbank Quarterly*. 2011 89(2): 289-332. Oberlander J. *The Political Life of Medicare* (Chs 6-7))
7	10/14	Assignment 1 – Student presentations	

8	10/21	Patient-centered medical homes *What capabilities predict success for patient-centered medical homes?*	Burke G. Advancing patient-centered medical homes in New York. United Hospital Fund 2013. Alidina S, Schneider EC, Singer SJ. Structural capabilities in small and medium-sized patient-centered medical homes. American Journal of Managed Care 2014; 20(9), e265-e277.
9	10/28	Health insurance exchanges *How might the governance of health insurance exchanges affect their performance?*	Families USA. Implementing health insurance exchanges: options for governance and oversight. April 2011. Kaiser Family Foundation. State health insurance marketplace governance. Available at: http://kff.org/health-reform/state-indicator/health-insurance-exchange-governance/ (browse) Kaiser Family Foundation. State decisions for creating health insurance marketplaces, 2014. Available at: http://kff.org/health-reform/state-indicator/state-decisions-for-creating-health-insurance-marketplaces/ (browse)
10	11/4	Accountable care organizations *What are the goals of an accountable care organization, and which organizations are best prepared to meet those goals?*	Burke G. Moving toward accountable care in New York. United Hospital Fund 2013. Fisher ES, Shortell SM, Kreindler SA et al. A framework for evaluating the formation, implementation, and performance of accountable care organizations. Health Affairs 2012; 31(11): 2368-2378. Scheffler RM, Shortell SM, Wilensky GR. Accountable care organizations and antitrust. JAMA 2012; 308(4): 338-339.
11	11/11	Provider competition and consolidation *In light of what you know about ACOs, what are the pros and cons of the consolidation of health care organizations? From the organization's perspective, what factors are necessary for a successful merger?*	Capps C, Dranove D. Hospital consolidation and negotiated PPO prices. Health Affairs 2004; 23(2): 175-181. Dafny L. Hospital consolidation – still more to come? The New England Journal of Medicine 2014; 370: 198-199. Case studies of realized and failed mergers:

			Scott G. How a hospital merger fell apart. Crain's. August 19, 2014. Sidorov J. Case study of a failed merger of hospital systems. Managed Care. November 2003. Rau J. In quest to grow, Catholic health system pares religious ties. Kaiser Health News. January23, 2012.
12	11/18	Labor market and health insurance *Does mandating health insurance benefits cause unemployment? For whom?* **Assignment 2 due**	Summers L. Some simple economics of mandated benefits. The American Economic Review 1989; 79(2): 177-183. Colla CH, Dow WH, Dube A. How do employers react to a pay-or-play mandate? Early evidence from San Francisco. Forum for Health Economics and Policy 2011; 14(2), Article 4.
13	11/25	Triple aim *What are the tradeoffs associated with the triple goal of patient experience, good health outcomes, and low costs? Are these good goals for a health care system?*	Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health Affairs 2008; 27(3): 759-769. The Institute of Medicine. Crossing the quality chasm: a new system for the 21st century. Executive summary. Available at: http://www.nap.edu/catalog.php?record_id=10027
14	12/2	Health care spending *Does the U.S. pay too much for health care? Does it get what it pays for*	Cutler DM. Your money or your life: strong medicine for America's health care system. Ch 2-7. New York: Oxford University Press, 2004. Orszag PR, Ellis P. The challenge of rising health care costs – a view from the Congressional Budget Office. The New England Journal of Medicine 2007; 357(18): 1793-1795.
15	12/9	Assignment 3 – op-eds	

Last Updated July 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 851: Topics in Public Health: Chronic Disease
3 Credits
Fall 2015

Time and location	8:00-9:45pm Silberman, C05
Instructor	C Mary Schooling, PhD Email: mschooli@hunter.cuny.edu Phone: mschooli@hunter.cuny.edu
Office hours	Tuesday, 4-6pm Room 545, 2180 Third Avenue, New York or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Chronic disease epidemiology describes and quantifies how different diseases affect population health. This course is designed to provide an overview of the prevalence, incidence and risk factors for major chronic diseases, knowledge about selected chronic diseases, their epidemiology, prevention and control. Readings will address the empirical patterns, prevailing theories and controversies regarding the etiology of chronic diseases, as well as addressing interventions or policies that may be applied to address chronic diseases and improve population health.
Course prerequisites	N/A
Course format	Lectures
Required reading and resources	Please see course schedule for week by week readings
Suggested reading and resources	

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Determine the influence of social, cultural, historical, behavioral and biological factors in population health.	1. Describe the burden of chronic diseases, nationally and globally 2. Describe global policy action on chronic diseases 3. Describe issues with the assessment of chronic disease burden 4. Place chronic diseases within a temporal and geo-ethnic context	1. Reaction paper 1 2. Reaction paper 2 3. Reaction paper 1 4. Reaction papers 3, 4 and 5
Design and implement research projects that: a. Quantify health and the burden of disease in populations b. Perform surveys and risk factor analyses c. Apply causal inference to study design, study implementation and data analysis; d. Identify vulnerable populations and their attributes; apply rigorous methods to examine and monitor health disparities. e. Identify effective interventions to improve population health equitably f. Evaluate the effectiveness of interventions designed to improve population health g. Give appropriate attention to the potential for bias, as well as exposure and outcome measurement issues.	1. Identify risk factors associated with specific chronic diseases 2. Describe the etiology of chronic diseases and identify any gaps 3. Read and critique epidemiologic and other public health literature effectively 4. Draw appropriate inferences from epidemiologic data, using established principles and guidelines 5. Identify primary and secondary prevention strategies for these diseases.	1. Reaction paper 6 2. Reaction paper 7 3. Paper Introduction 4. Paper Discussion 5. Reaction papers 8, 9,10,11,12,13
Operationalize studies of the complex interactions between multiple determinants of population health in a variety of settings, exploiting the differences between settings as a source of insight	I. Summarize the evidence concerning a major modifiable risk factor for a key non-communicable disease, and address gaps in the evidence	1. Paper Results 2. Grant proposal

Course Assessments

This course will be assessed based on reaction papers (13), a paper, a presentation, a grant proposal and participation. The reaction paper should synthesize and critically evaluate key theoretical, methodological and/or substantive contributions of the readings, along with a few questions for clarification and discussion. This may consist of identifying questions that the readings provoke; critiquing problematic assumptions, logic, and measurement; discussing theoretical and empirical advances; and considering ideas for future directions. Please reference all statements of fact. Please format as single-spaced, typed, 12-point Times Roman font with 1-inch margins. Each presentation should last about 10 minutes.

The paper will be a manuscript. Students will work on the sections of the manuscript in steps: (1) topic description (no more than 2 pages), (2) introduction (2 pages) (3) methods (3 pages) (4) results (no more than 5 pages) (5) Discussion (5 pages). Complete paper (no more than 15 pages, excluding references and tables). At each step, students will turn in to the instructor and their fellow students the written document to receive feedback. Students should be considerate in giving feedback to their colleagues, and can do so either orally or by writing comments. The grant proposal will be in the format of an NIH proposal for an R03. Please reference all statements of fact. Each section of the paper and the proposal, as well as the final completed paper, will be assigned a numeric grade by the instructor. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

Grading

Evaluation criteria

Evaluation criteria

In general reaction papers, the paper and the presentation will be evaluated according to their demonstration of a) grasp of the topic, b) identification of the key points, c) synthesis of the material, and d) explanation of the implications for practice. Participation will be evaluated according to contribution to the discussion.

Grading rubrics for the assessments

GRADING RUBRICS	(A+ to A-)	(B+ to B-)	(C+ to C)	(F)
Reaction papers, paper and presentation	Provides a comprehensive and critical synthesis of the topic with appropriate examples and discussion of their implications	Identifies the implications of the key points in the topic, provides some critical apprasial	Describes the main topic	Inability to identify and describe the main topic

The relative weight of each course component is as follows:

Assessment	Weight
Reaction papers 13	39%
Topic description	5%
Introduction	5%
Methods	10%
Results	5%
Discussion	5%
Proposal	15%
Presentation	15%

Participation	6%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation
All members of the class are expected to actively participate in class activities and discussions, and to complete assigned reading prior to class. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible.

Late/incomplete submission of assignments
All assignments must be submitted via blackboard by 4PM on the day of the class. It is expected that your writing will be of graduate-level quality, presented in a readable and consistent manner. Assignments handed in after the due date without prior permission may not be accepted. If you anticipate the need to turn in work late, please contact me to negotiate a mutually acceptable submission plan in advance of the assignment's due date. Please do not ask for an extension on the due date of the assignment.

Make-ups, rewrites, and extra credit
Rewrites are permitted for reaction papers.

Expectations of students

Students are required to attend each class, as participation in the discussion is essential to understanding the existing evidence on the topic and drawing judgments. In the case of illness, students should email me the day of class. In the case of unavoidable absence (e.g. work related conference), students should email me one week prior to the class. Students should prepare adequately for class, and participate appropriately. Appropriate participation includes:

- Active listening
- Building on what others say
- Staying focused on the topic of the session
- Clarifying the assumptions underlying opinions/statements
- Using the readings and epidemiologic ideas to develop arguments
- Constructively challenging the ideas of others, rather than accepting statements that are inadequately supported
- Allowing others to request explanation when needed
- Coming prepared, rather than relying on the group to explain difficult topics

Expectations for the instructor

Students can expect the instructor to provide access to the week-by-week readings (on blackboard), to provide substantial background information at each session as powerpoints available shortly after each session, and to facilitate discussion. Students can expect reaction papers to be graded within 1 week and other assignments to be graded within 2 weeks.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

This schedule & assignments are subject to change throughout the semester. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. Opportunities for group work will be scheduled during some sessions.

Session	Date	Topic	Readings	Assignment Due
1	**27 Aug**	Global burden of disease	1. GBD 2013 Mortality and Causes of Death Collaborators. . Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2015 Jan 10;385(9963):117-71 2. Global Burden of Disease Study 2013 Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013.Lancet. 2015 Jun 7. pii: S0140-6736(15)60692-4. doi: 10.1016/S0140-6736(15)60692-4 3. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. Int J Cancer. 2010 Jun 17. 4. Cowie CC, Rust KF, Byrd-Holt DD, Gregg EW, Ford ES, Geiss LS, Bainbridge KE, Fradkin JE. Prevalence of diabetes and high risk for diabetes using A1C criteria in the U.S. population in 1988-2006. Diabetes Care. 2010 Mar;33(3):562-8 5. Agarwal R, Norton JM, Konty K, Zimmerman R, Glover M, Lekiachvili A, McGruder H, Malarcher A, Casper M, Mensah GA, Thorpe L. Overreporting of deaths from coronary heart disease in New York City hospitals, 2003. Prev Chronic Dis. 2010 May;7(3):A47	Reaction paper 1 Describe the burden of major chronic diseases globally and locally
2	**3 Sept**	Millenium Development goals (MDGs)and the Sustainiable Development Goals (SDGs)	1. https://sustainabledevelopment.un.org/focussdgs.html 2. http://www.un.org/millenniumgoals/ 3. Lomazzi M, Laaser U, Theisling M, Tapia L, Borisch B. Millennium Development Goals: how public health professionals perceive the achievement of MDGs. Glob Health Action. 2014 Sep 22;7:24352. 4. Sachs JD From millennium development goals to sustainable development goals. Lancet. 2012 Jun 9;379(9832):2206-11.	Reaction paper 2 Compare and contrast the MDGs with the SDGs
3	**17 Sept**	Epidemiological transition and chronic diseases	1. Omran AR. The epidemiologic transition. A theory of the Epidemiology of population change. 1971. Bull World Health Organ. 2001;79(2):161-70 2. Gaziano JM. Fifth phase of the epidemiologic transition: the age of obesity and inactivity. JAMA. 2010 Jan 20;303(3):275-6 3. Normile D. A sense of crisis as China confronts ailments of affluence. Science. 2010 Apr 23;328(5977):422-4 4. Yang S, Khang YH, Harper S, Davey Smith G, Leon DA, Lynch J. Understanding the rapid increase in life expectancy in South Korea. Am J Public Health. 2010 May;100(5):896-903	Reaction paper 3 Describe the epidemiological transition and identify countries at different stages Paper – Topic Description
4	**24 Sept**	Secular trends in selected chronic diseases	1. Lawlor DA, Ebrahim S, Davey Smith G. Sex matters: secular and geographical trends in sex differences in coronary heart disease mortality. BMJ. 2001 Sep 8;323(7312):541-5 2. Lawlor DA, Smith GD, Leon DA, Sterne JA, Ebrahim S. Secular trends in mortality by stroke subtype in the 20th century: a retrospective analysis. Lancet. 2002 Dec 7;360(9348):1818-	Reaction paper 4 Describe trends in major chronic diseases

			23 3. Zhao D, Liu J, Wang W, Zeng Z, Cheng J, Liu J, Sun J, Wu Z. Epidemiological transition of stroke in China: twenty-one-year observational study from the Sino-MONICA-Beijing Project. Stroke. 2008 Jun;39(6):1668-74 4. Nikiforov SV, Mamaev VB (1998) The development of sex differences in cardiovascular disease mortality: a historical perspective. Am J Public Health 88: 1348–1353. *5.* Gale EA, Gillespie KM (2001) Diabetes and gender. Diabetologia 44: 3–15 6. Savu A, Potter J, Li S, Yasui Y. Breast cancer and microbial cancer incidence in female populations around the world: a surprising hyperbolic association. Int J Cancer. 2008 Sep 1;123(5):1094-9.	
5	**1 Oct**	Geo-ethnic differences in selected chronic diseases	1. Yang W, Lu J, Weng J et al. Prevalence of diabetes among men and women in China. *N Engl J Med.*2010;362(12):1090-1101. ***2.*** Stirbu I, Kunst AE, Bos V, Mackenbach JP. Differences in avoidable mortality between migrants and the native Dutch in The Netherlands. BMC Public Health 2006; 6:78.): 78. 3. Ahmad N, Bhopal R. Is coronary heart disease rising in India? A systematic review based on ECG defined coronary heart disease. *Heart.* 2005;91(6):719-725. 4. Howe HL, Lake A, Schymura MJ, Edwards BK. Indirect method to estimate specific Hispanic group cancer rates. Cancer Causes Control. 2009 Sep;20(7):1215-26. 5. Jemal A, Center MM, DeSantis C, Ward EM., Global patterns of cancer incidence and mortality rates and trends. Cancer Epidemiol Biomarkers Prev. 2010 Aug;19(8):1893-907 6. Zhang XH, Lu ZL, Liu L. Coronary heart disease in China. Heart. 2008 Sep;94(9):1126-31	Reaction paper 5
6	**8 Oct**	Risk stratification	1. Capewell S, Hayes DK, Ford ES, Critchley JA, Croft JB, Greenlund KJ, Labarthe DR. Life-years gained among US adults from modern treatments and changes in the prevalence of 6 coronary heart disease risk factors between 1980 and 2000. Am J Epidemiol. 2009 Jul 15;170(2):229-36 2. Hajifathalian K et al, A novel risk score to predict cardiovascular disease risk in national populations (Globorisk): a pooled analysis of prospective cohorts and health examination surveys. Lancet Diabetes Endocrinol. 2015 May;3(5):339-55. 3. Ford ES, Will JC, Mercado CI, Loustalot F. Trends in predicted risk for atherosclerotic cardiovascular disease using the pooled cohort risk equations among US adults from 1999 to 2012. JAMA Intern Med. 2015 Feb;175(2):299-302 4. Grill S, Fallah M, Leach RJ, Thompson IM, Hemminki K, Ankerst DP. A simple-to-use method incorporating genomic markers into prostate cancer risk prediction tools facilitated future validation. J Clin Epidemiol. 2015 May;68(5):563-73.	Reaction paper 6 Paper - Introduction
7	**15 Oct**	Etiology	1. Marmot MG, Syme SL, Kagan A, Kato H, Cohen JB, Belsky J. Epidemiologic studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii and California: prevalence of coronary and hypertensive heart disease and associated risk factors. Am J Epidemiol. 1975 Dec;102(6):514-25. 2. Ezzati M, Obermeyer Z, Tzoulaki I, Mayosi BM, Elliott P, Leon DA. Contributions of risk factors and medical care to cardiovascular mortality trends. *Nat Rev Cardiol* 2015 3. Taşan M, Musso G, Hao T, Vidal M, MacRae CA, Roth FP. Selecting causal genes from genome-wide association studies via functionally coherent subnetworks. Nat Methods. 2015 Feb;12(2):154-9.	Reaction Paper 7
8	**22 Oct**	Does Obesity matter?	1. Flegal KM, Graubard BI, Williamson DF, Gail MH. Cause-specific excess deaths associated with underweight, overweight, and obesity. JAMA. 2007 Nov 7;298(17):2028-37. 2. Schooling CM, Lam TH, Li ZB, Ho SY, Chan WM, Ho KS, Tham MK, Cowling BJ, Leung GM. Obesity, physical activity, and mortality in a prospective chinese elderly cohort. Arch Intern	Reaction Paper 8

			Med. 2006 Jul 24;166(14):1498-504 3. Su D. Body mass index and old-age survival: a comparative study between the Union Army Records and the NHANES-I Epidemiological Follow-Up Sample. Am J Hum Biol. 2005 May-Jun;17(3):341-54 4. Davey Smith G, Sterne JA, Fraser A, Tynelius P, Lawlor DA, Rasmussen F. The association between BMI and mortality using offspring BMI as an indicator of own BMI: large intergenerational mortality study. BMJ. 2009 Dec 22;339	
9	**29 oct**	Is moderate alcohol use protective?	1. Doll R, Peto R, Boreham J, Sutherland I. Int J Epidemiol. 2005 Feb;34(1):199-204. Mortality in relation to alcohol consumption: a prospective study among male British doctors. 2. Naimi TS, Brown DW, Brewer RD, Giles WH, Mensah G, Serdula MK, Mokdad AH, Hungerford DW, Lando J, Naimi S, Stroup DF. Cardiovascular risk factors and confounders among nondrinking and moderate-drinking U.S. adults. Am J Prev Med. 2005 May;28(4):369-73 3. Howard AA, Arnsten JH, Gourevitch MN. Effect of alcohol consumption on diabetes mellitus: a systematic review. *Ann Intern Med.* 2004;140:211-219 4. Zilkens RR, Burke V, Watts G, Beilin LJ, Puddey IB. The effect of alcohol intake on insulin sensitivity in men: a randomized controlled trial. *Diabetes Care.* 2003;26:608-612 5. Holmes MV et al, Association between alcohol and cardiovascular disease: Mendelian randomisation analysis based on individual participant data. BMJ. 2014 Jul 10;349:g4164.	Reaction Paper9 Paper - Methods
10	**5 Nov**	What about supplements (vitamins, minerals, hormones)?	1. Lawlor DA. The HRT story: are there any benefits? Int J Epidemiol. 2003 Oct;32(5):897-8 2. Knekt P, Ritz J, Pereira MA, O'Reilly EJ, Augustsson K, Fraser GE, Goldbourt U, Heitmann BL, Hallmans G, Liu S, Pietinen P, Spiegelman D, Stevens J, Virtamo J, Willett WC, Rimm EB, Ascherio A, Antioxidant vitamins and coronary heart disease risk: a pooled analysis of 9 cohorts. Am J Clin Nutr. 2004 Dec;80(6):1508-20. 3. Bjelakovic G, Nikolova D, Gluud C. Antioxidant supplements and mortality. Curr Opin Clin Nutr Metab Care. 2014 Jan;17(1):40-4. 4. Reid IR, Bristow SM, Bolland MJ. Calcium supplements: benefits and risks. J Intern Med. 2015 Jul 14. 5. Khaw KT, Dowsett M, Folkerd E et al. Endogenous testosterone and mortality due to all causes, cardiovascular disease, and cancer in men: European prospective investigation into cancer in Norfolk (EPIC-Norfolk) Prospective Population Study. *Circulation.* 2007;116(23):2694-2701. 6. Basaria S, Coviello AD, Travison TG et al. Adverse Events Associated with Testosterone Administration. *N Engl J Med.* 2010.	Reaction Paper 10 Paper - Results
11	**12 Nov**	What is a healthy diet?	1. KEYS A., Prediction and possible prevention of coronary disease. Am J Public Health Nations Health. 1953 Nov;43(11):1399-1407 2. Boffetta P, et al Fruit and vegetable intake and overall cancer risk in the European Prospective Investigation into Cancer and Nutrition (EPIC). J Natl Cancer Inst. 2010 Apr 21;102(8):529-37. 3. Measurement Error of Dietary Self-Report in Intervention Trials. Natarajan L, Pu M, Fan J, Levine RA, Patterson RE, Thomson CA, Rock CL, Pierce JP. Am J Epidemiol. 2010 Aug 18. 4. Price GM, Paul AA, Cole TJ, Wadsworth ME. Characteristics of the low-energy reporters in a longitudinal national dietary survey. Br J Nutr. 1997 Jun;77(6):833-51. 5. Foster GD, Wyatt HR, Hill JO, Makris AP, Rosenbaum DL, Brill C, Stein RI, Mohammed BS, Miller B, Rader DJ, Zemel B, Wadden TA, Tenhave T, Newcomb CW, Klein S. Weight and metabolic outcomes after 2 years on a low-carbohydrate versus low-fat diet: a randomized	Reaction Paper 11 Paper - Discussion

			trial. Ann Intern Med. 2010 Aug 3;153(3):147-57. 6. Dietary Guidelines for Americans 2015	
12	**19 Nov**	Student presentations -		
13	**3 Dec**	Lay epidemiology	1. Hunt K, Emslie C. Commentary: the prevention paradox in lay epidemiology--Rose revisited. Int J Epidemiol. 2001 Jun;30(3):442-6. 2. Frankel S, Davison C, Smith GD. Br J Gen Pract. 1991 Oct;41(351):428-30. Lay epidemiology and the rationality of responses to health education. 3. Schlomann P, Schmitke J. Lay beliefs about hypertension: an interpretive synthesis of the qualitative research. J Am Acad Nurse Pract. 2007 Jul;19(7):358-67. 4. Tong EK, Glantz SA. Tobacco industry efforts undermining evidence linking secondhand smoke with cardiovascular disease. Circulation. 2007 Oct 16;116(16):1845-54. 5. Brownell KD, Warner KE. The perils of ignoring history: Big Tobacco played dirty and millions died. How similar is Big Food? Milbank Q. 2009 Mar;87(1):259-94 6. Kuper H, Nicholson A, Kivimaki M, Aitsi-Selmi A, Cavalleri G, Deanfield JE, Heuschmann P, Jouven X, Malyutina S, Mayosi BM, Sans S, Thomsen T, Witteman JC, Hingorani AD, Lawlor DA, Hemingway H. Evaluating the causal relevance of diverse risk markers: horizontal systematic review. BMJ. 2009 Nov 5;339:b4265.	Reaction Paper 12
14	**10 Dec**	Prevention strategies	1. TW Hu, Z Mao, J Shi, et al, The role of taxation in tobacco control and its potential economic impact in China, Tob Control 2010 19: 58-64. 2. Hopkins DP et al, Smokefree Policies to Reduce Tobacco Use A Systematic Review 3. Am J Prev Med 2010;38(2S):S275–S289 4. Melanie A Wakefield, Barbara Loken, Robert C Hornik, Use of mass media campaigns to change health behaviour, Lancet 2010; 376: 1261–71 5. West R et al, Behavior change techniques used by the English Stop Smoking Services and their associations with short-term quit outcomes, Nicotine & Tobacco Research, Volume 12, Number 7 (July 2010) 742–747	Reaction Paper 13 Proposal due
15	**17 Dec**	Policy Implications and Conclusions		Final Paper Due

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 890 Advanced Research Seminar I
3 Credits
Fall 2015

Time and location	Monday 4:15PM to 6:15PM, Room 3207
Instructor	Grace Sembajwe, ScD, MS David Bimbi, PhD, MPhil, MA Email gsembajw@hunter.cuny.edu dbimbi@lagcc.cuny.edu Phone: 212-396-7735 (GS) Office Silberman Bldg, Hunter College, CUNY School of Public Health 2180 Third Ave @ 119th St, Rm. 527 (GS)
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Students develop specific research questions pertaining to potential areas of interest for their doctoral dissertations and prepare a proposal that specifies a research question, a public health rationale for the study and an appropriate research design and methods. Students will be expected to complete a literature review and design a study, which may later lead to a dissertation proposal.
Course prerequisites	PUBH 800, PUBH 801
Course format	This course is intended to provide doctoral students in public health with exposure to in-depth, critical examination and consideration of qualitative and quantitative research methods, study designs and analyses in applied contexts. It is conducted in a seminar format, including guest speakers presenting their research with particular emphasis on the methodological approaches utilized. Students consider specific research ideas pertaining to potential areas of interest for their doctoral dissertations. They prepare a proposal that specifies a research question, a public health rationale for the study based on a comprehensive literature review,

	and an appropriate study design/methodology for the potential research. This may subsequently inform development of the dissertation proposal in PUBH891.
Required reading and resources	Firebaugh G. Seven Rules for Social Research. Princeton, NJ: Princeton University Press; 2008 Luker K. Salsa Dancing Into the Social Sciences. Cambridge, MA: Harvard University Press; 2008 Readings from the literature, noted on the syllabus (below) on Blackboard and/or on reserve
Suggested reading and resources	Remler DK, Van Ryzin GG. Research Methods in Practice: Strategies for Description and Causation (2nd ed). Thousand Oaks, CA: Sage Publications; 2014. Texts available in the Library's Reserve Reading Room or online

Last Updated July 23, 2015

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Design and conduct etiological, intervention, policy, implementation science and other empirical studies that contribute to new knowledge about population health	Critically analyze research studies utilizing qualitative, quantitative, and mixed methods.	1, 3, 6, 8, Methods Critiques 13, 14, Research Idea Project
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues.	Define different types of research methods and designs and understand the epistemological basis for their use.	3, 4, 6, 7, 9, 11, Research Idea Project
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	Explain the relative strengths and weaknesses of different methods and designs in order to choose a method best suited to addressing specific research questions.	2, 3, 4, 6, 7, 9, Methods Critiques, Research Idea Project
Demonstrate leadership skills to facilitate the goals of population health research and practice.	Identify specific threats to validity that pertain to different research designs, how a researcher may go about minimizing those threats, and the potential impact on the conclusions drawn from a study with such limitations.	4, 6, 7, Research Idea Project
Design and deliver innovative educational experiences that promote learning about population health in academic and practice-based settings.	Provide an informed, methodological critique of actual public health and social research projects, including soundness of research design (strengths and weaknesses) and implications of conclusions drawn from the analyses. Understand the concepts of reliability and validity and ways in which they are assessed.	4, 6, Methods Critiques 3, 5, 6, 8, 12, 13, 14 Methods Critiques, Research Idea Project

Course Assessments

Students' understanding of the course material will be evaluated through a combination of in-class activities and participation, written assignments, and presentations described below..

Grading

Evaluation criteria

Grading

20%	Methods Critique (due before the class following the presentation): - Written critique of methods-related aspects of **2** guest researcher presentations (Mary Schooling; Christian Grov)
20%	Class Discussion Leaders (~2/class): - Students selected at random each class lead discussion of the readings for that week (strongly suggested that all students come to each class with notes from the readings to assist with the discussion)
	Research Idea Development Project (50% total):
30%	- Written proposal (final draft)
20%	- Class presentation of research idea (10% for *own* presentation and 10% for peer-review forms for *all other* student presentations)
10%	Class Participation: - Pertains to expectation of perfect attendance and active class participation that is indicative of having completed the readings in advance of each class session
100%	

Assignments should be submitted on Blackboard before the start of class on the day that they are due. Final grades are based on the sum of assignment scores as described above. There will be no opportunity to do additional work for extra credit.

Graduate Center Grade Policy
A (plus or minus) - Excellent
B (plus or minus) - Good
C (plus or minus) - Fair (lowest passing mark)
F - Failure
W - Withdrew without academic penalty. This is a student-initiated grade, which may be requested from the 4th through the 10th week of the semester. Under no circumstances can a student withdraw and receive a "W" grade after the 10th week of the semester

without the written permission of the course instructor and the Executive Officer, and the approval of the Vice President for Student Affairs. This grade carries tuition liability.

The relative weight of each course component is as follows:

Assessment	Weight
Methods Critique	20%
Class Discussion Leader	20%
Written Proposal	30%
Class Presentation	20%
Class Participation	10%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Students are expected to attend every class session (including Grand Rounds) and complete the readings prior to each of the class sessions so as to be able to participate fully during the class. The instructors should be notified by email or voicemail if an absence is unavoidable; excessive lateness may be considered equivalent to absence from class. It is the student's responsibility to obtain missed class notes and related information from a colleague. Assignments must be received by the due dates regardless of class attendance.

Late/incomplete submission of assignments

Assignments are due on the date indicated in this syllabus. A full grade will be deducted for each week an assignment is late. In case of emergency, please contact the instructor. Incomplete final grades for this course will NOT be granted unless the request is justified by a legitimate and documented emergency.

Make-ups, rewrites, and extra credit

There will be no opportunity to do additional work for extra credit.

Expectations of students

Class citizenship & rules of conduct
Cellphones and other electronic devices
Use of any electronic devices in class must be limited to accessing the course materials under discussion in that session and taking notes. Under no circumstances should these devices be used for communication with others within or outside of the classroom. Students are expected to be fully engaged with and participating in the class; thus, use of any devices that distract the student(s), instructor(s), and/or guest(s) will be considered intrusive and in violation of expected standards of conduct in the classroom. As such, the student may be asked to discontinue use of the device.

Expectations for the instructor

Email correspondence
The instructors will try to respond to emails within a 24-hour period during the standard Monday through Friday work week. Students should not wait until a Friday to send an email if a response is needed before the following Monday. The instructors may respond over the weekend but it is not guaranteed. Responses that take more than a day during the work week may be due to special circumstances, such as the instructor

is attending an out-of-town conference, the student's query is of a complex nature that requires consultation with others/obtaining additional information, etc.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

Use of Blackboard
All assignments and course documents will be posted on Blackboard (Bb). Bb announcements and/or email will used to communicate new information and/or changes. It is the student's responsibility to check Bb frequently for such announcements.

Course/syllabus changes
This syllabus is a guide for the course and is subject to change, particularly given the advanced-level and seminar nature of the course. Changes will be announced in class and/or will be posted on the course Blackboard site.

Week	Date	Topic	Assigned readings	Graded assessments due
1	8/31	Grand Rounds	http://www.gc.cuny.edu/Page-Elements/Academics-Research-Centers-Initiatives/Doctoral-Programs/Public-Health-%28DPH%29/Program-Events	
2	9/10 (Thursday following Monday schedule)	Course overview and introduction: 'Deep thinking' about the research endeavor	Luker: Ch. 1 and 2 – What's it all about?	A paragraph describing a topic of interest for possible dissertation research
3	9/21	Beyond Specifying Hypotheses	Firebaugh: Ch. 1: The possibility of surprise	
4	9/28	It's Not Just a 'Quant' or 'Qual' Study Guest: David Bimbi	Luker: Ch. 3 and 4: Cannonical social science; What is this a case of? Firebaugh: Ch. 2: Differences that make a difference Guest readings TBD	
5	10/5	Grand Rounds	http://www.gc.cuny.edu/Page-Elements/Academics-Research-Centers-Initiatives/Doctoral-Programs/Public-Health-%28DPH%29/Program-Events	
6	10/19	Components of Study Design: I	Firebaugh: Ch. 3: Build in Reality Checks Luker: Ch. 6: Sampling, Operationalization and	DUE: 2-3 page "research idea" document (statement of problem/issue; research question(s);

		Guest: Mary Schooling	Generalization Recommended: Small M. How many cases do I need? On science and the logic of case selection in field-based research. Ethnography. 2009;10:5-38. Guest readings TBD	description of most appropriate study design/methodology)
7	10/26	Components of Study Design: II	Firebaugh: Ch. 4: Replicate Hoppe A, Heaney CA, Fujishiro K, Gong F, Baron S. Psychosocial work characteristics of personal care and service occupations: A process for developing meaningful measures for a multiethnic workforce. Ethnicity and Health. 2014;3:1-19. Optional: Luker: Ch. 5: Reviewing the literature	
8	11/2	Grand Rounds	http://www.gc.cuny.edu/Page-Elements/Academics-Research-Centers-Initiatives/Doctoral-Programs/Public-Health-%28DPH%29/Program-Events	Due: Critique 1 (Mary Schooling)
9	11/9	Components of Study Design: III	Firebaugh: Ch. 5: Compare like with like Luker: Ch. 7 and 8: The nitty-gritty; Field and other methods	
10	11/16	Components of Study Design: IV Guest: Christian Grov	Luker: Ch. 10: Data reduction and analysis Firebaugh: Ch. 6: Study change Guest readings TBD	
11	11/23	Discussion on methods vis-à-vis research	Firebaugh: Ch. 7: Method as servant, not master	Due: Critique 2 (Christian Grov)
12	11/30	Student		SUBMIT: Peer-review

		research proposal presentations		form for each presenter
13	12/8	Student research proposal presentations		SUBMIT: Peer-review form for each presenter
14	12/14	Grand Rounds	http://www.gc.cuny.edu/Page-Elements/Academics-Research-Centers-Initiatives/Doctoral-Programs/Public-Health-%28DPH%29/Program-Events	
15	12/21			DUE: "Research Idea" Project (final draft)

Institutional Policies

Help with research and writing
Librarians at the CUNY GC Mina Rees Library are available to help students with using research databases and citation software in person or remotely by phone, chat or email. Contact information can be found on the library's research website at: http://library.gc.cuny.edu/research-help/

The GC Wellness Center provides academic consultation services to help keep students on track with their academic work by working on the obstacles to progress and developing strategies to overcome them. More information can be found on the GC Wellness Center's website at: http://www.gc.cuny.edu/Prospective-Current-Students/Student-Life/Health-Wellness/Counseling-Services/Academic-Health

Last day to drop the course with the grade of "W": November 19, 2015
http://www.gc.cuny.edu/Public-Programming/Calendar/Academic-Calendar-2015-16/Detail?id=29019

Grade of Incomplete (INC) and Graduate Center Policies
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergency. Only students averaging a C or above in the course are eligible to request an incomplete course grade. According to Graduate Center policy updated 7/11/2011, to resolve incomplete grades, students must fulfill their obligations within one calendar year after the INC grade is assigned. After one year, an incomplete grade (''INC'') will become a permanent incomplete. Extensions will be granted only in exceptional circumstances upon written application and with the permission of the faculty member, the Executive Officer, and the Vice President for Student Affairs. Permanent incompletes will accrue no credit. Students with more than two incomplete courses will be brought to the attention of their Executive Officer to determine whether or not they are making satisfactory progress. Students will not normally be regarded as

making satisfactory progress toward their degrees if they have more than two “INC”s on their records. Students should be aware that continued registration and most financial aid awards are conditional upon satisfactory progress. Students should also note that credits for which they have an “INC” as of the end of the third week of classes of a given semester are not counted toward advancement to the next level for that semester.

Grade appeals

The doctoral faculty as a whole and, more specifically, the faculty of a doctoral program are responsible for determining the requirements and standards of performance for courses and for qualifying examinations. A course instructor retains considerable discretion in these matters. The instructor is under obligation, however, to ensure that the course syllabus is consonant with the goals of the curriculum of the degree program. The expected level of performance in a given course shall reflect levels of difficulty relevant to the educational objective of the program. In addition, the instructor has an obligation to students to make clear the basis of evaluation (e.g., reading assignments, papers, contributions to seminar discussions, experimental work) at the start of each course so that students are not surprised by unexpected or untimely demands. Grades on examinations or for work in a course are the responsibility of the instructor. Specific information pertaining to the procedures for an official grade appeal through the GC can be found in the GC student handbook at: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf Refer students to the current academic calendar for important dates (for example: holidays, course drop, course withdrawal). Provide a hyperlink to the current academic calendar.

Last Updated Oct 21, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 891 Advanced Research Seminar II
3 Credits
Fall 2015

Time and location	4:15-16:15 GC Room 6114
Instructor	Professor Mimi Fahs, PhD, MPH Email: mfahs@hunter.cuny.edu Phone: 212 396-7758 Office: Silberman Building Room 541 (2180 Third Ave (at 119th Street), NY, NY 10035
Office hours	Wednesdays 4-6 and by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Guides advanced students in the completion of their dissertation proposal and, if needed, Institutional Review Board (IRB) application for dissertation research. Faculty assist students to refine the research design, to fully develop appropriate research methods and analytic strategies and to provide protection for human subjects in their dissertation research. In order to take PUBH 891 Research Seminar II, students need to have defended the Second Exam or with permission of the instructor, have the Second Exam defense scheduled within the first two weeks of the semester. Students must successfully defend the Second Exam to continue the course.
Course prerequisites	All coursework; Successful defense of the Second Exam
Course format	Seminar
Required reading and resources	Macrina, Francis L. *Scientific Integrity*. ASM Press. 2005 Kuhn, Thomas. *The Structure of Scientific Revolutions.* U of Chicago Press. 2012 (4th edition)
Suggested reading and resources	2 Completed Dissertations in the student's subject or methods area

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Assess the mechanisms and pathways by which factors influence individual and population health.	• Describe specific research questions to be answered in the proposal;	• Participation in class discussions based on assignments
Design and conduct etiological, intervention, policy, implementation science and other empirical studies that contribute to new knowledge about population health	• Define Specific Aims	• Oral presentations
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues.	• Engage faculty in a dissertation committee	• Written assignments
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	• Identify data sources and explain methods proposed to answer these questions;	• Final draft dissertation proposal
Implement professional and organizational ethical guidelines in population health research and practice.	• Assess the strengths and weaknesses of these methods;	•
Secure resources to conduct population health research and practice	• Describe obstacles likely to be encountered in a dissertation project and propose strategies to overcome these obstacles;	•
	• Prepare a written draft dissertation proposal and present orally.	•

Course Assessments

Participation in class discussion based on assignments (This includes written assignments throughout the semester)	30%
Complete draft dissertation proposal	70%

Grading

Evaluation criteria

The relative weight of each course component is as follows:

Assessment	Weight
Specific Aims	10%
Conceptual Framework	10%
Analytic Methods	10%
Draft Dissertation Proposal	70%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Attendance and class participation are required. Expect to actively contribute to the discussion and complete and submit all assignments by posted due dates. Missed assignments or lack of discussion participation not only affect the individual student, but they also affect the class as a whole due to the high degree of interaction within the course.

Late/incomplete submission of assignments

Acceptance of late/incomplete assignments due to unavoidable delays in research progress must be pre-approved by the instructor.

Make-ups, rewrites, and extra credit

The nature of this seminar requires numerous rewrites as the student progresses toward a defendable proposal, with full committee engagement.

Expectations of students

- Be familiar with Graduate Center and DPH program requirements including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use GC library resources, including dissertation searches, and citation managers
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

- Develop and maintain contact with dissertation committee sponsor – and individual committee members as advised by sponsor.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours Monday through Friday.
- Grading and feedback on assignments within 1 week of the due date.
- Individual sessions with the instructor to overcome perceived barriers to dissertation proposal progress
- Communication about progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings and Assignments
1	Aug 31	**DPH GRAND ROUNDS**	Dr. Lyndon Haviland "Dangerous Beliefs: Public Health & Preparations for a Revolution"
	Sept 7	**NO CLASS – Labor Day**	
2	**Sept 10** **(Mon Classes Meet Thursday)**	Course Overview- Dissertation proposal components	Moving from Second Exam Committee to Dissertation Committee formation Students brief presentation of their topic (5 minutes).
	Sept 14	**NO CLASS (Rosh Hashana)**	
3	Sept 21	Critical Review of NIH Proposal	Sample NIH Proposal Student review and critiques of specific aims: how did the proposal address these?
4	Sept 28	**NO CLASS**	Visit library and pick two dissertations with similar topic to

			student's topic Begin drafting specific aims
5	Oct 5	**GRAND ROUNDS**	Debrework Zewdie, PhD "Leadership in Public Health: From AIDS to Universal Health Coverage"
	Oct 12	**NO CLASS (Columbus Day)**	
6	Oct 19	Development of Research Questions - Hypotheses - Specific Aims	Summary of strengths and limitations of similar dissertations - organization, clarity of aims, contribution to existing literature, whether the aims/questions were answered, etc. Class discussion
7	Oct 26	Student presentations- Specific Aims	Brief PPT for discussion Student Dissertation Committee Progress Reports ***Draft Specific Aims Due***
8	Nov 2	**GRAND ROUNDS**	TBA
9	Nov 9	Students' overview of research questions, data,	Student presentations – In-class

		methods and possible challenges for proposed study	discussion Student Dissertation Committee Progress Reports (cont.) ***Revised Specific Aims Due***
10	Nov 16	Theory and Conceptual Framework -	Student brief PPT presentations - linking specific aims and methods through a guiding theory and conceptual framework Student Dissertation Committee Progress Reports ***Draft Conceptual Framework Due***
11	Nov 23	Finish Conceptual Framework – Begin Methods Discussion	Data base and variables presentation Analytic methods Dissertation Committee reports (cont.)
12	Nov 30	Methods Discussion – (cont)	***Draft Methods Due***

13	Dec 7	Student Presentations	**Brief overview of each section of the Dissertation Proposal, including Schedule for Completion**
14	Dec 14	**GRAND ROUNDS**	**20 min PPT**
15	Dec 21	Student Presentations	***Full Draft of Dissertation Proposal Due***

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 893: Leadership & Organizational Change Seminar
3 Credits
Fall 2015

Time and location	Mondays 6:30 PM – 8:30 PM GC – 365 5th Avenue room 3207 August 27, 2015 – December 23, 2015
Instructor	Nevin Cohen, Ph.D. Associate Professor, CUNY School of Public Health 55 West 125th Street, room 811 New York, NY 10027 212-646-8340 (T) 917-721-8037 (M) nevin.cohen@sph.cuny.edu (preferred contact)
Office hours	Wednesdays 3:00 to 6:00 or by appointment
Website	https://canvas.instructure.com/courses/957345
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	The Public Health Leadership Seminar introduces students to theories and models of leadership and organizational change and helps students to analyze their roles in fostering leadership in public health. Using a case study approach, students analyze successful and unsuccessful examples of public health leadership and organizational change.
Prerequisites	PUBH 800, PUBH 801
Course format	In-class seminar with guest lectures and some online discussions.
Required reading and resources	The seminar discussions will be based on weekly journal articles and book chapters. See course schedule and website for the complete reading list. All readings will be available on the course website. We will read portions of the following books, which will be available in PDF form on the course website: Werhane, Patricia H., and Mollie Painter-Morland. *Leadership, gender, and organization*. Springer Netherlands, 2011; Kellerman, Barbara. *The end of leadership*. HarperBusiness, 2012 (ISBN: 0062069160); Western, Simon. *Leadership: A critical text*. SAGE, 2013 (ISBN: 1446269906); Uhl-Bien, Mary, and Sonia Ospina. *Advancing relational leadership research: A dialogue among perspectives*. Information Age Publishing. 2012. (ISBN: 1617359211)
Suggested reading and resources	Optional readings are listed on the course website.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify, develop, evaluate and recommend policy and programmatic interventions to improve population health at individual, community, government and country levels based on empirical evidence of social, political, cultural, biological, economic, historical, behavioral, environmental, and global factors in health and disease.	• Critically discuss the leadership literature • Apply leadership theories to the design, implementation and evaluation of public health interventions • Understand the process of organizational change through a leadership framework • Analyze health policies and programs through the lens of organizational leadership	• In-class and online discussions • Reading reflections • Preparation of a public health leadership case study
Assess the mechanisms and pathways by which factors influence individual and population health.	• Assess organizational and community leadership as a factor in individual and population health outcomes	• In-class and online discussions • Reading reflections • Preparation of a public health leadership case study
Demonstrate leadership skills to facilitate the goals of population health research and practice.	• Apply leadership theories to one's own research and practice. • Foster leadership among colleagues, staff and community members	• In-class and online discussions • Reading reflections • Leadership of class discussions • Preparation of a public health leadership case study
Design and deliver innovative educational experiences that promote learning about population health in academic and practice-based settings	• Integrate concepts of leadership into courses, workshops, training sessions and other teaching activities	• In-class and online discussions • Leadership of class discussion
Implement professional and organizational ethical guidelines in population health research and practice	• Understand the ethical dimensions of organizational leadership research and practice, including the assumptions underlying conventional and critical leadership methodologies	• Preparation of a public health leadership case study. • Reading reflections
Secure resources to conduct population health research and practice	• Apply leadership concepts to the design and implementation of public health research and interventions	• In-class and online discussion • Preparation of a public health leadership case study

Course Assessments

Details about the assignments and grading criteria can be found on the course website.

Course participation: This is a seminar-style course, which requires your active participation in class (and in online discussions). In each class session we will discuss the assigned readings and connect them to previous readings in this course, other public health literature, and to your professional and academic experiences. I generally rate participation categorically (high, medium, low, none).
Leadership of class discussion: At the beginning of the semester, students will select particular topics/readings and will be responsible for actively leading the discussion during the session in which those readings are discussed. This is graded pass/fail.
Reading reflections: You will post brief analyses, observations, questions, critiques, and reflections on the week's readings. The goal is to provide another opportunity besides our in-class discussions to share your thoughts about the readings and the underlying concepts covered in the articles and chapters and for me to get a sense of your interpretation of the material we're covering (and to respond to points and queries). What I'm looking for is not a précis of the reading, but rather your own reactions and interpretations. I generally rate participation categorically (high, medium, low, none).
Leadership case study: We will individually (and if desired, collaboratively) prepare a collection of concise, well-researched and written case studies of innovative and alternative forms of public health leadership in New York City. The cases will analyze individuals and groups that might otherwise not be visible in the conventional leadership literature. Examples might include social change organizations working to address environmental health issues, urban farmers promoting nutrition, immigrant organizations seeking to increase access to healthcare, or public agency officials attempting to change organizational culture. The most successful case studies will engage the critical leadership literature and illustrate how leadership emerges among different groups, in response to different public health challenges, and through different mechanisms. I welcome the opportunity to work beyond the end of the semester with students interested in turning their paper into a publishable journal article.

Grading

<u>Evaluation criteria</u>
Students who perform exceptionally in all aspects of the course will receive an "A." A grade of "B" will reflect adequate work. Any grade below a "B" will indicate that you should be performing better. All assignments must meet professional standards of analysis, presentation, and timeliness. Accurate spelling and grammar, and clear and concise writing, are critical. Assignments *will not be accepted after they are due* unless you have a compelling reason for being late (e.g., medical or family emergencies) and I agree to an alternative due date. The relative weight of each course component is as follows:

Assessment	Weight
Course Participation	20%
Leadership of discussion	5%
Reading reflections	15%
Leadership case study	60%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation
You are required to attend every class that meets in person and to participate in every online discussion session. This is particularly important as we meet only once per week. As noted above, I expect active participation in class discussions.

Late/incomplete submission of assignments
Late or incomplete assignments will not be accepted unless you are ill or have a family emergency. If you know you will not be able to meet a deadline contact me as soon as possible to discuss an alternate deadline.

Make-ups, rewrites, and extra credit
The case study will be submitted in segments, as outlined in the course schedule. Each submission will be returned with comments and suggestions, and if these are addressed in the final submission your final grade will reflect your efforts at revising the paper throughout the semester. I do not offer extra credit assignments.

Expectations of students

One of the biggest obstacles to successful learning is not allocating sufficient time to coursework. I realize that D.Ph. students are juggling multiple responsibilities, but I expect you to devote the time and energy required to learn the course material and to do a good job on the course paper. I also expect you to be the consummate professionals that you are – showing respect and treating each other collegially. In your interactions with me, please be open and communicative – please tell me if the course is not meeting your expectations so that I can make adjustments. Whatever you do, please let me know if you are having trouble with the course. Other expectations include the following:

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and the academic calendar.
- Know how to use library resources and citation tools.
- Come to class fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date unless due to a medical or family emergency.
- No credit for assignments suspected of plagiarism. (and see the Academic Integrity section below for the additional consequences of plagiarism)
- Regularly check the course website and official university email for course correspondence. The readings and schedule are likely to change, and it is your responsibility to keep track.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

My goal is to make this course a valuable learning experience that is intellectually interesting and challenging and relevant to your professional and academic work. You can expect me to be prepared each week, to make myself as accessible as possible, to return your work promptly (usually within one week) with comments and suggestions, and to treat each of you with respect and collegiality. I have high expectations and strict standards, but I also try to be very reasonable if you express concerns or problems to me as they arise (and not at the end of the term). Specifically, I will try to:

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours Monday through Friday.
- Communicate about grades and progress in the course through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule
This schedule is likely to change as the semester progresses. Please check the course website for updates, and ask if you are unsure about scheduled topics/readings or assignments. Also refer to the current academic calendar for important university-wide dates.

Session	Date	Topic	Readings/Resources	Assessment
1	8/31/15	**Course Overview:** This course critically assesses the notion of leadership and leadership studies and considers alternative frameworks for analyzing strategies to achieve organizational goals. Kellerman's book discusses changes in politics, culture, the economy and technology that challenge conventional theories of leadership. While Kellerman is a professor at the Kennedy School, her book is written for a general audience and can be read rather quickly. I'd like you to read it *prior* to the first class, if at all possible, so that we have a context within which to discuss the frameworks we plan to use throughout the semester.	Kellerman, B. (2012). The end of leadership. HarperBusiness.	-Course participation -Reading reflections
	9/7/15	Labor Day – No classes		
2	9/10/15 (classes follow Monday Schedule)	**Introduction to Leadership:** One concept critical to the distinction between leadership and management is the "wicked problem," which describes the types of problems that public health practitioners typically deal with. I've assigned Rittel and Webber's classic article in which they coin the term, along with other readings that begin to sort out what leadership means and	- Rittel HWJ, Webber MM. Dilemmas in a General Theory of Planning. Policy Sci. 1973;4(2):155-169. - Western, S. (2013). *Leadership: A critical text*. Sage. Chapter 2. - Beinecke RH. Leadership for Wicked Problems. 2009;14(1):1-17. - Grint K. Wicked problems and clumsy solutions : the role of leadership. 2010:1-16. *Due: Name and brief description of proposed*	-Course participation -Reading reflections

		why it is important to those of us interested in social change.	*leadership case*	
	9/14/15	Rosh Hashanah – No Classes		
3	9/21/15 Note: This class will be conducted online.	**Beyond the Heroic**: Much of the conventional literature on leadership focuses on the traits of people (often individuals) who influence other followers. This not only fails to reflect actual organizational processes but can disempower those not typically thought of as leaders. This week's readings introduce more recent theories of leadership, framing it as a complex interrelationship among individuals, or individuals and organizations, interacting to achieve change. The readings are part of an edited volume on gender and leadership, and as we'll discuss, these critical leadership theories help us to understand how leadership research can better address issues of structural power dynamics.	Werhane Chapters 4-9	-Course participation -Reading reflections
4	9/28/15	**Followership and Leadership:** Although leaders need followers, the leadership literature has only recently focused on the co-creation of these two roles. The article by Uhl-Bien reviews the literature on followership and discusses two theoretical frameworks for understanding how followers (and thus leaders) are constituted:	-Uhl-Bien M, Riggio RE, Lowe KB, Carsten MK. Followership theory: A review and research agenda. Leadership Q. 2014;25(1):83-104. *Due: Case study outline and draft summary of organization*	-Course participation -Reading reflections -Leadership case study

		one based on the interactions among leaders and followers, and an one that suggests leaders and followers construct their roles based on the organizational contexts in which they exist.		
5	10/5/15	**Distributed and Resistance Leadership:** The followership literature still gives short shrift to those entitites that contribute to the goals of an organization. A distributed leadership approach analyzes the networks of influence that move organizations in particular directions. The Zoller, Fairhurst article discusses how leadership can mobilize resistance within organizations.	-Gronn P. Distributed leadership as a unit of analysis. Leadersh Q. 2002;13(4):423-451. -Hoppe B, Reinelt C. Social network analysis and the evaluation of leadership networks. Leadersh Q. 2010;21(4):600-619. -Tourish D. Leadership, more or less? A processual, communication perspective on the role of agency in leadership theory. Leadership. 2014;10(1):79-98. -Zoller HM, Fairhurst GT. Resistance leadership: The overlooked potential in critical organization and leadership studies. Hum Relations. 2007;60(9):1331-1360.	-Course participation -Reading reflections
	10/12/15	Columbus Day – No Classes		
6	10/19/15	**Leadership as Practice:** Leadership is forged through the everyday social practices that occur within organizations, according to the articles assigned this week. A practice perspective suggests the need to focus on the often overlooked day-to-day activities that shape the direction of an organization and help to construct organizational leadership. The Ospina et al. chapter also illustrates	Carroll B, Levy L, Richmond D. Leadership as Practice: Challenging the Competency Paradigm. Leadership. 2008;4(4):363-379. Ospina et al., Social Change Leadership as Relational Leadership. In Uhl-Bien and Ospina (eds.), Advancing Relational Leadership Research	-Course participation -Reading reflections

		methods for leadership research on social change organizations.		
7	10/26/15	**Integrative Leadership:** One of the challenges public health practitioners face is developing successful cross-sector and interdisciplinary collaborations to solve wicked problems. This chapter discusses a framework for forming and evaluating partnerships and the role of leadership in their success.	Crosby and Bryson, Integrative Leadership and Policy Change: A Hybrid Relational View, chapter 10 in Uhl-Bien and Ospina. *Due: Literature review and revised case profile*	-Course participation -Reading reflections -Leadership case study
8	11/2/15	**Leadership and diversity:** Public health professionals must lead organizations and networks that are demographically diverse. These readings address this issue from various perspectives. Fletcher discusses power and gender in the analysis of leadership. Rosener discusses leadership differences between women and men. Offermann addresses leadership of diverse organizations. The chapter by McCartney profiles the development of leadership among young girls in Chicago.	-Fletcher JK. The paradox of postheroic leadership: An essay on gender, power, and transformational change. Leadersh Q. 2004;15(5):647-661. -Offermann, Relational Leadership: Creating Effective Leadership with Diverse Staff. Chapter 12 in Uhl-Bien and Ospina -McCartney, K. Every Girl is a Leader. Chapter 13 in Werhane and Painter-Morland. -Rosener, J. B. Ways Women Lead. Chapter 3 in Werhane and Painter-Morland.	-Course participation -Reading reflections
9	11/9/15	**Social Change Leadership:** These readings (adding to the previous Ospina et al chapter) discuss the role of leaders in social change networks – in this case, addressing two critical public health issues: food and physical activity and HIV/AIDS. The Folta article uses an	-Folta SC, Seguin R a, Ackerman J, Nelson ME. A qualitative study of leadership characteristics among women who catalyze positive community change. *BMC Public Health*. 2012;12(1):383. -Trapence G, Collins C, Avrett S, et al. From personal survival to public health: Community	-Course participation -Reading reflections

		entity perspective to examine the leadership traits of women community leaders and the Trapence et al. article discuss networks of community leaders.	leadership by men who have sex with men in the response to HIV. *Lancet*. 2012;380(9839):400-410.	
10	11/16/15	**Enhancing Community Leadership through CBPR:** Information and analytical capabilities often enable academics to lead and/or control. The two articles this week address the role of researchers in buildng and supporting leadership within communities through community based participatory research.	-Farquhar S a., Michael YL, Wiggins N. Building on leadership and social capital to create change in 2 urban communities. Am J Public Health. 2005;95(4):596-601. -Freudenberg N, Pastor M, Israel B. Strengthening community capacity to participate in making decisions to reduce disproportionate environmental exposures. Am J Public Health. 2011;101(SUPPL. 1):123-131.	-Course participation -Reading reflections
11	11/23/15	**Guest Speaker TBA**	*Due: First complete draft of leadership case study*	-Course participation -Reading reflections -Leadership case study
12	11/30/15	**Case Study**	Lee KK. Developing and implementing the Active Design Guidelines in New York City. Health Place. 2012;18(1):5-7.	-Course participation -Reading reflections
13	12/7/15	**Case Study**	Schoch-Spana M, Franco C, Nuzzo JB, Usenza C. Community engagement: leadership tool for catastrophic health events. Biosecur Bioterror. 2007;5(1):8-25.	-Course participation -Reading reflections
14	12/14/15	**Guest Speaker TBA**	*Due: Final draft of leadership case study*	
15	12/21/15	**Case Study**	Graff SK, Kappagoda M, Wooten HM, McGowan AK, Ashe M. Policies for Healthier Communities:	-Course participation -Reading reflections

			Historical, Legal, and Practical Elements of the Obesity Prevention Movement. *Annu Rev Public Health*. 2012;33(1):307-324. Gostin LO. Bloomberg's Health Legacy: Urban Innovator or Meddling Nanny? Hastings Cent Rep. 2013;43(5):19-25. doi:10.1002/hast.208.	

Last Updated Aug 23, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 898 Dissertation Seminar
0 Credits
Fall 2015

Time and location	Graduate Center, Skylight Room (365 Fifth Ave) August 31 (Grand Rounds) – 4:15 – 6:15p October 5 (Grand Rounds) - 4:15 – 6:15p November 2 (Grand Rounds) - 4:15 – 6:15p December 14 (Grand Rounds) - 4:15 – 6:15p
Instructor	Terry Huang, PhD, MPH, CPH Professor of Community Health Terry.huang@sph.cuny.edu Jim Stimpson, PhD Professor of Health Policy & Associate Dean, Academic Affairs Jim.stimpson@sph.cuny.edu Michele Kiely, PhD Professor of Epidemiology & Associate Dean, Research Michele.kiely@sph.cuny.edu 55 W. 125 Street New York, NY 10027 Email is best way to contact instructors.
Office hours	Email for individual appointments.
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This is a non-credit required course that students must take every semester they are enrolled in PUBH 89901, 02, 03 and 04 or PUBH 900.The dissertation seminar meets four times a semester and serves as a workshop in which students attend Public Health Grand Rounds, present and discuss their dissertation research, and review aspects of each other's work (peer review).
Course prerequisites	N/A
Course format	Grand Rounds and Seminars
Required	None

reading and resources	
Suggested reading and resources	None

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Design and conduct etiological, intervention, policy, implementation science and other empirical studies that contribute to new knowledge about population health	• Explain the use of appropriate study designs to answer different research questions	• Grand rounds attendance • Class discussion •
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues.	• Describe how theories, methods and/or data from diverse disciplines can be applied to your research question(s) • Demonstrate progressive depth in your research thinking	• Class discussion • Story boards
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	• Present your research in a clear and methodical manner	• Research briefs • Written and oral presentation of research
Design and deliver innovative educational experiences that promote learning about population health in academic and practice-based settings .	• Offer constructive feedback to peers on their research progress	• Peer review

Course Assessments

This course is non-credit. However, students will be given feedback by instructors on their performance accordining to their attendance, performance during class, and timely feedback on peer reviews.

Grading

Evaluation criteria
Pass/Fail

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
N/A

Grade appeals
N/A

Course Policies

Attendance and class participation
This is a required course for all DPH students during their dissertation stage. Attendance at Grand Rounds and Seminars is mandatory. Excuses are accepted only in extrenuous circumstances on a case-by-case basis.

Late/incomplete submission of assignments
N/A

Make-ups, rewrites, and extra credit
N/A

Expectations of students
Students are expected to attend all sessions, participate fully and actively, and comply with all requirements pertaining to written, oral, and peer review coursework.

Expectations for the instructor
Instructors will assist students on their research development in groups during class and, as needed, one-on-one outside class. Email communication with instructors is preferred outside class. Instructors will respond within two business days upon receipt of any email inquiry.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

Session	Dates	Topics	Assignments Due
1	Aug. 31	Overview and Introduction to the Course Public Health Career Outside Academia Special Speaker: Lyndon Haviland, DrPH Lyndon Haviland & Company	N/A
2	Oct. 5	Grand Rounds (TBA) Research Progress Updates	Story Boards
4	Nov. 2	Grand Rounds (TBA) Research Progress Updates	Research Brief (specific aims) Presentations
6	Dec. 14	Grand Rounds (TBA) Research Progress Updates	Peer Review Presentations

Last Updated August 27, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 82400: Applied Biostatistics I
3 Credits
Fall 2015

Time and location	Wednesday, 6:05-7:50 pm, Silberman (2180 3rd Ave), Room C08
Instructor	Shiro Horiuchi, PhD Professor, CUNY School of Public Health 2180 3rd Ave, Room 521 Phone 212-396-7749 Shiro.Horiuchi@hunter.cuny.edu (preferred contact)
Office hours	Wednesday 4:00 – 5:30pm or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	For public health professionals to be effective, they must be able to ensure that policies and interventions are evidence-based. Epidemiologists design studies to determine which policies and interventions are most effective in promoting healthy individuals, families and societies. Biostatistics provides epidemiologists with the necessary tool kit to appropriately analyze public health data. The emphasis of this class is on acquiring a set of foundational tools in regression models to apply to public health research questions and data. Topics include simple and multiple linear regression, logistic regression, ordinal and polytomous regression and model building techniques including assessing for multi-collinearity, effect measure modification, non-linearity and model fit statistics.
Course prerequisites	Introductory statistics course
Course format	This course is taught with a combination of lectures and in-class computer exercises using SPSS (for linear regression), SAS (for logistic regression) and Excel (for basic statistical analysis). All materials are available on the course website.
Required reading and resources	Ford AC, et al. 2005. *American Journal of Epidemiology* 162:454-460. Hall SL, Greendale GA, 1998. *Calcified Tissue International* 63:183-189. Simanek AM, Dowd JB, Aiello AE. 2009. *International Journal of Epidemiology* 38:775-787.

	Wisborg K, et al. 2001. *American Journal of Epidemiology* 154:322-327.
Suggested reading and resources	Fox J. *Applied Regression Analysis and Generalized Linear Models. Third Edition*. Sage Publications; 2015. ISBN-10: 1452205663, ISBN-13: 978-1452205663. (Second Edition is also all right.)

Proposed revisions to DPH Epidemiology Competencies **All graduates of the EPI track will be able to:**	**Course Learning Objectives**	**Assessment Methods**
Epidemiologic methods		
1. Determine the influence of social, cultural, historical, behavioral and biological factors in population health.	• Interpret results of linear regression and logistic regression analyses; assess the extent to which the results support the initially proposed hypothesis; evaluate the predictive accuracy and reliability of the results; and examine if the results are consistent with the statistical assumptions of the methods and models* * "Linear regression and logistic regression" in this table include both simple regression (one independent variable) and multiple regression (two or more independent variables)	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
2. Operationalize studies of the complex interactions between multiple determinants of population health in a variety of settings, exploiting the differences between settings as a source of insight 3. Design and implement research projects that a. Quantify health and the burden of disease in populations b. Perform surveys and risk factor analyses c. Apply causal inference to study design, study implementation and data analysis; d. Identify vulnerable populations and their attributes; apply rigorous methods to examine and monitor health disparities. e. Identify effective interventions to improve population health equitably f. Evaluate the effectiveness of interventions designed to improve population health	• Describe and explain the model equations, assumptions and estimation procedures of linear regression and logistic regression*	• Mid-term and Final Examinations • Homework 1 & 2

g. Give appropriate attention to the potential for bias, as well as exposure and outcome measurement issues.		
Epidemiologic content		
4. Demonstrate mastery of causal inference and apply these techniques to scientific questions relevant to at least two current public health issues or population groups that are relevant to the student's substantive content interests 5. Identify and apply appropriate biostatistical approaches to analyses that address epidemiological questions in public health research and practice.	• Identify if linear regression or logistic regression is a suitable tool for investigating the research question with the given data, and assess its advantages and limitations*	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
	• Set up linear regression and logistic regression models that are suitable for the data and research question*	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
	• Run at least one of widely used statistical software packages to conduct linear regression and logistic regression*	• In-class Computer Exercises • Research Notes 1 & 2
Teaching and consultation		
6. Present empiric findings persuasively to a wide array of audiences (oral and written); 7. Work with colleagues to translate epidemiologic findings into practicable interventions; 8. Teaching epidemiologic methods to students, more junior colleagues or to others in public health	• Write scientific reports of linear regression and logistic regression analyses, with properly formatted and labeled tables and figures*	• Research Notes 1 & 2
	• Orally present results of linear regression and logistic regression analyses*	• Research Notes 1 & 2
	• Correctly summarize results of linear regression and logistic regression analyses in published	• Research Notes 1 & 2

	literature, and critically evaluate statistical aspects of the research*	

Course Assessments

Descriptions on details about the assignments and grading criteria will be shown on the course website

Mid-term Examination: Students will take an in-class examination, about 50~60 minutes long, solving technical and computational problems that are mostly related to linear regression analysis.

Final Examination: Students will take an in-class examination, about 100 minutes long, solving technical and computational problems that are mostly related to logistic regression analysis.

Homework 1: Students will solve a set of technical and computational problems that are mostly related to linear regression analysis and submit the answers.

Homework 2: Students will solve a set of technical and computational problems that are mostly related to logistic regression analysis and submit the answers.

Research Note 1: A subset of data from a health survey will be provided. Each student will develop a hypothesis that could be investigated with the data, analyze the data using linear regression, and write a research report.

Research Note 2: A subset of data from a health survey will be provided. Each student will develop a hypothesis that could be investigated with the data, analyze the data using logistic regression, and write a research report.

In-class Computer Exercises: During the last 20~40 minutes of most classes, students will do computer exercises using computer terminals in C08, and upload their output files onto the assigned location of Discussion Board of the course website or submit them to the instructor by email after the class. The output files may be edited to remove results with errors.

Class Participation: Students should actively participate in the classes by asking questions to the instructor and orally responding to questions from the instructor during the lecture and in-class exercise.

Grading

Evaluation criteria

Evaluation criteria for research notes are described in the assignment instructions, which will be posted on the course website. In-class examinations are assessed primarily with respect to the accuracy of answers and the appropriateness of the approach adopted to solve the problems. In-class computer exercises and homework 1

and 2 are assessed primarily according to whether a sufficient amount of effort has been made. Class participation is assessed in terms of the quality and frequency of questions and replies.

The relative weight of each course component is as follows:

Assessment	Weight
Mid-term in-class examination	20%
Final in-class examination	25%
Research note 1	20%
Research Note 2	25%
Homework 1	2.5%
Homework 2	2.5%
In-class exercise and class participation	5%
	100%

The grading system for the course is as follows:

Letter Grade	Quality Points	Percentage
A+	4.0	97.0 - 100
A	4.0	93.0 - 96.9
A-	3.7	90.0 - 92.9
B+	3.3	87.0 - 89.9
B	3.0	83.0 - 86.9
B-	2.7	80.0 - 82.9
C+	2.3	77.0 - 79.9
C	2.0	70.0 - 76.9
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons

and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Attendance is required. No student will get a full point for "in-class exercise and class participation" if s/he misses more than 3 classes or the number of in-class exercise outputs that are not submitted in time is 3 or more.

Late/incomplete submission of assignments

Late/incomplete submission of Research Notes is not accepted. Late submission of Homework is not accepted. In-class exercise outputs are accepted if they are submitted by the end of the class or within 4 days after the class.

Make-ups, rewrites, and extra credit

With permission of the instructor, students may be allowed to resubmit research notes, homework assignments, and in-class computer exercise outputs before the due date.

Expectations of students

- Be familiar with Graduate Center's academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Classes are offered in a computer laboratory. During the class, NEVER do any email work or website browsing unrelated to the class.
- Complete all assignments by their assigned due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- There is no group discussion in this course, but students are expected to participate actively in the classes, by asking scientific and technical questions to the instructor if there are any unclear issues, and by responding to questions from the instructor.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.
- Because in-class exercise outputs and homework assignments 1 and 2 are not returned with corrections or comments, students are expected to compare their

outputs and answers with the model scripts/outputs and answer keys that will be posted on the course website.

Expectations for the instructor

- Provide course materials (including presentation files, data files, computer programs, assignment instructions, copies of or links to articles in the required reading list), regular announcements, reminders, suggestions on the course website.
- Answer questions asked by students during the class.
- Respond to students' email inquiries within 2 days.
- Provide students with individualized in-person instructions during their office-hour visits.
- Communication about grades and progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

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Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings/Resources	Assessment
1	9/2	Introduction to multiple linear regression 1: Basic models and partial regression coefficients (Part 1)	JF 5	ICE
2	9/9	Introduction to multiple linear regression 1: Basic models and partial regression coefficients (Part 2)	JF 5; HG	ICE
	9/16	9/16 - Last day to drop without a grade of "W"		
3	9/16	Introduction to multiple linear regression 2: Categorical independent variables	JF 7.1-2	ICE
	9/23	No class		
4	9/30	Introduction to multiple linear regression 3: Ordinary least squares and R^2	JF 5	ICE
5	10/7	Introduction to multiple linear regression 4: Statistical inference.	JF 6.1-2	ICE Homework 1 assigned
6	10/14	Issues in regression analyses 1: Examination of hypotheses on causal relationships I. Explanation of RN1. HW1 answers	JF 6.3 & 1.2	Homework 1 due Research Note 1 assigned
7	10/21	Issues in regression analyses 2: Nonlinearity (Mid-term in-class examination)	JF 12.3	Mid-term in-class examination
8	10/28	Introduction to logistic regression 1: Basic models	JF 14.1	ICE
9	11/4	Introduction to logistic regression 2: Adjusted odds ratio	JF 14.1; AF; KW	ICE Research Note 1 due
	11/9	Last day to withdraw with a grade of 'W'		
10	11/11	Issues in regression analyses 3: Interaction	JF 7.3	ICE
11	11/18	Introduction to logistic regression 3: Maximum likelihood estimation.	JF 14.1.4-5	
12	11/25	Issues in regression analyses 4: Examination of hypotheses on causal relationships II.	SDA	ICE Homework 2 assigned

				Research Note 2 assigned
13	12/2	Introduction to logistic regression 4: Ordinal and polytomous logistic regression.	JF 14.2	ICE Homework 2 due
14	12/9	(Final in-class examination)		Final in-class examination
15	12/16	Issues in regression analyses 5: Multi-collinearity, stepwise regression, partial and part correlation	JF 13	ICE
	12/20			Research Note 2 due

Keys: AF = Ford et al. 2005; HG = Hall & Greendale 1998; ICE = In-class computer exercise; JF = recommended textbook by John Fox; KW = Wisborg et al. 2001; SDA = Simanek Dowd & Aiello 2008.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
EPI 75000: Epidemiological Methods I: Study Research Design
3 Credits
Fall 2015

Time and location	Tuesdays 6:30-8:30pm at The Graduate Center (365 5th Avenue) room 6418
Instructor	**Name** Elizabeth Kelvin, PhD, MPH **Title** Assistant Professor **Email** ekelvin@hunter.cuny.edu **Phone** 212-396-7751 **Office** 2180 Third Avenue (119th Street), room 543 Email is the preferred methods of communication
Office hours	Wednesdays 5:00pm – 6:30pm and by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course will provide an in depth understanding of the design and conduct of epidemiological studies, including causal inferences, measurement, major study designs, threats to validity, and urban public health applications. Examples will be based on the health of New York City residents.
Course prerequisites	PH 75100, PH 75300 or equivalent
Course format	Each class will begin with a lecture. Most classes will then have either a computer-based exercise or a class discussion of the reading assignments following the lecture.
Required reading and resources	• Aschengrau A & Seage GR. Essentials of Epidemiology in Public Health, 3rd edition, Jones and Bartlett publishers, 2014. • Additional assigned readings listed below (pages 11-16) are available blackboard.
Suggested reading and resources	• Susser E, Schwartz S, Morabia A, & Bromet EJ. Psychiatric Epidemiology, 1st edition, Oxford University Press, 2006. • SPSS is suggested but not required. If you decide to purchase a license, be sure that it allows you to open large datasets (which will be necessary in some classes), write syntax, and run various forms of regression including Cox proportional hazards models. Student packages may not provide all the features needed for this class. The software is available for student use outside of class at the Hunter and Graduate Center computer labs and to GC students via the intranet. Note that Hunter students may not have access to the GC computer lab and GC students may not have access to the Hunter computer labs.

Epidemiology-track Competencies	***Course Learning Objectives***	***Assessment Methods***
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify key sources of data for epidemiologic purposes	• Be familiar with some publicly available population-based health • Identify benefits and limitations of using publicly available data	• Class computer labs • Computer assignments • Class exams
Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	• Apply descriptive statistics to characterize the distribution of health conditions • Test hypotheses regarding associations between health and domains of risk (environmental, demographic, behavioral, biological, social and economic) • Use confidence intervals and p-values to draw conclusions regarding statistical uncertainty	• Class computer labs • Computer assignments • Class exams
Critically read and evaluate the strengths and limitations of epidemiologic literature from a methodologic perspective	• Be able to recognize study design, study population, main research objectives, analytic methods used, main findings and implications of epidemiologic articles • Discuss strengths and weaknesses of epidemiologic articles in terms of research question, design, data collection, analysis and interpretation	• Written assignment • Class computer labs • Computer assignments • Class exams • Class discussion
Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	• Choose and apply appropriate study designs to answer different research questions, taking scientific merits, feasibility, cost, and logistics in account • Construct analytic plans appropriate to datasets and research questions provided	• Written assignment • Class computer labs • Computer assignments • Class exams • Class discussion

Identify key threats to validity (internal and external) within and across epidemiologic studies	• Be familiar with random error and understand approaches to reduce it • Recognize potential biases and identify methods to avoid bias or assess impact • Evaluate potential confounders and adjust for them when necessary • Assess reliability of measures • Communicate the limitations of specific research projects	• Written assignment • Class computer labs • Computer assignments • Class exams • Class discussion
Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	• Use SPSS software to describe epidemiologic data, assess relationships among variables, and answer research questions	• Class computer labs • Computer assignments • Class exams

Biostatistics-track Competencies	**Course Learning Objectives**	**Assessment Methods**
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Describe assumptions, procedures, strengths and limitations of statistical methods that are used in public health research	• Describe and explain the model equations, assumptions and estimation procedures of linear regression, logistic regression, and Cox proportional hazards models including both simple regression (one independent variable) and multiple regression (two or more independent variables). • List inherent limitations in both the data under study as well as the statistical method used to analyze the data	• Class computer labs • Computer assignments • Class exams
Select statistical methods that are suitable for different purposes of analysis and different types of data	• Apply descriptive statistics to characterize the distribution of health conditions • Test hypotheses regarding	• Class computer labs • Computer

	associations between health and domains of risk (environmental, demographic, behavioral, biological, social and economic) using the appropriate form of regression (linear, logistic or Cos proportional hazards) given the data and research question. • Use confidence intervals and p-values to draw conclusions regarding statistical uncertainty	assignments • Class exams
Apply statistical methods correctly in public health research	• Set up regression models (linear, logistic, Cox) that are suitable for the data and research question. • Apply and interpret regression model parameters and draw conclusions about hypotheses • Calculate an odds ratio, risk ratio and rate ratio by hand and using statistical software	• Class computer labs • Computer assignments • Class exams
Use information technology and computer software effectively for collection, management, analysis and presentation of public health data	• Use SPSS software to describe epidemiologic data, assess relationships among variables, and answer research questions	• Class computer labs • Computer assignments • Class exams
Accurately describe computer outputs of those analyses and appropriately interpret the statistical results	• Interpret results of descriptive analysis and regression models; assess whether the results refute the initially proposed hypothesis; evaluate the reliability and validity of the data (Kappa, Cronbach's alpha); and examine if the results are consistent with the statistical assumptions of the methods and models. • Interpret computer output and critically evaluate statistical aspects of the research.	• Class computer labs • Computer assignments • Class exams
Summarize correctly and critically evaluate statistical analyses in published literature	• Be able to recognize study design, study population, main research objectives, analytic methods used, main findings and implications of	• Written assignment • Class computer

	epidemiologic articles • Discuss strengths and weaknesses of epidemiologic articles in terms of research question, design, data collection, analysis and interpretation • Consider alternate approaches to answer the same research questions	labs • Computer assignments • Class exams • Class discussion

Course Assessments
Your understanding of the course material will be evaluated through class discussion and computer lab participation, 3 computer assignments, one written assignment and two exams.

Grading
The course grade will be calculated based on (1) class participation, (2) a written assignment, (3) three graded computer assignments (4) a midterm exam and (5) a final exam.

1. Class Participation: Students are expected to prepare for the class in advance by doing the reading and thinking about the discussion topic before class. Attendance and active participation in the discussions are expected and will be calculated as part of the course grade. Students may miss two classes with no impact on their participation grade.

2. Written Assignment: Students are asked to write a position paper discussing assessment of causation in epidemiology. The purpose of the position paper is to help students organize their thoughts on a topic of importance in epidemiology and develop an informed argument to support their ideas. Each paper should begin with a clear statement of the student's position, or thesis, followed by a structured argument supporting that thesis, describing and discussing the limitations of the counter-arguments. The paper should be no more than 5 pages long, double spaced, 12-point font with 1 inch margins. The paper will be assigned a numeric grade based on how well the student supports his/her thesis using the class readings. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

Students may discuss their papers with each other but must turn in their own, independently conceptualized and written assignment and are asked ***to not*** share their draft papers with others. Sources, including readings assigned for this class, must be appropriately cited and referenced (please use AMA citation format or that used by *Epidemiology*). Citation software, such as endnote, is available for free from the university (Graduate Center http://library.gc.cuny.edu/sp/subjects/Citation%20Guides, Hunter: http://library.hunter.cuny.edu/services/endnote) and it is expected (i.e. required) that students will use citation software.

PAPER TOPIC: Is it possible to prove causation in epidemiology? Your paper should include a discussion about what we mean by a cause in epidemiology (definition), how we conceptualize causes and try to identify them in epidemiology, with specific reference to the thinking behind the RCT, cohort and case control study designs, and the limitations of epidemiology in identifying causes? – Due December 2

Grading Rubric for Written Assignment	
Criterion	% of assignment grade
Position stated clearly upfront	20%
Evidence provided to support thesis and well organized into a structured argument	30%
Conclusion supported by the evidence	20%
Writing clear, organized and grammatically correct	20%
Citations correctly identified	10%
GRADE	100%

3. Computer Assignments: Students will be asked to submit three computer assignments (see schedule below). If time permits, students may begin exercises during class and then complete and format the document to include appropriate interpretation, tables, and syntax on their own. The final document should include the SPSS tables (only the pertinent tables) and text to answer each question in the main document and the comprehensive syntax used for all analyses in an appendix pasted at the end of the word document. Students may discuss their assignments with each other but must turn in their own, independently analyzed and written assignment. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

4. Midterm Exam: Students will have a take home midterm exam to complete in 1 week, consisting of short answer questions about topics covered during class lectures and in readings. Students must work independently and not discuss the exam with classmates. The exam should be typed double spaced with 12-point font and 1 inch margins and should be e-mailed to the instructor by 8:30pm on the due date. Late midterms will lose 10 points out of 100 for each day they are late (including weekends and holidays).

5. Final Exam: The final exam will be a take-home computer assignment involving statistical analysis in SPSS of an analytic question, and students are expected to analyze the provided data, interpret findings in the context of the literature, and draw

conclusions. The exam must be completed independently and students may not discuss the exam with classmates. Students will be given the questions 1 week before the exam is due. The final exam should be typed double spaced with 12-point font and 1 inch margins and should be turned in at the beginning of class or e-mailed before the class begins. Late finals will lose 10 points out of 100 for each day they are late (including weekends and holidays).

The relative weight of each course component is as follows:

Assessment	Weight
Class participation	5%
Written assignment	20%
3 Computer assignments	25%
Midterm exam	25%
Final exam	20%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract

with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Students are expected to prepare for the class in advance by doing the reading and thinking about the discussion topic before class. Attendance and active participation in the discussions are expected and will be calculated as part of the course grade. Students may miss two classes with no impact on their participation grade.
Late/incomplete submission of assignments

See assignment specific rules under the Grading section above.

Make-ups, rewrites, and extra credit

Make-ups, rewrites, and extra credit assignments are not allowed.

Expectations of students

- You must sign up for Blackboard so that you can obtain course readings, updates and lecture notes and other handouts. For instructions on registering for a portal account in order to access Blackboard, go to: https://portal.cuny.edu/portal/site/cuny/index.jsp?epi-content=LOGIN.
- For this course we will be using the blackboard site for PH820, so the EPI750 students should make sure they can access that course.
- Please forward your CUNY e-mail to your most frequently checked e-mail address. Check your e-mail regularly so that you can receive emergency communications and periodic updates about the class.
- You are expected to complete readings and written assignments prior to class.
- SPSS version 18.0 or 19.0 will be used during most classes and is used for some assignments. The CUNY license covers only on-campus use. The software is available for student use in the CUNY School of Public Health at Hunter College and the Graduate Center computer labs outside of class hours. For Graduate Center students, the software is also available in computer labs and via the intranet.

- Students might want to bring a thumb-drive to class when computer exercises are planned to save their work. Alternately they can e-mail the documents created in class to themselves for archiving.
- If you do not have SPSS on your home computer, you will need to export the SPSS syntax and output to PDF or paste it into a word document in order to access it on your home computer. If you use a MAC, PDFing the documents may make it easier to open them on your computer.
- Student assignments should be turned-in on paper at the beginning of class. However, if a student will not be able to attend a class, assignments can be e-mailed to the instructor before the class begins (e.g. before 6:30pm the day of the class) to receive credit. The instructor will reply when a document is received, so if a reply is not received by the student within a few hours he/she should contact the instructor to be sure that the assignment was sent correctly. Students should save their sent email as a record demonstrating that they turned the assignment in on time in case the email is not received by the instructor.

Expectations for the instructor

- Power Point lecture slides will be available for download on Blackboard prior to class.
- The instructor is available during office hours and by appointment to assist students with assignments, course material, and exam preparation. The preferred method of communication with the instructor is e-mail. Please schedule appointments in advance.
- Emails will be answered within 3 business days. If a student has not heard back within that time period, s/he may want to send the email again. Emails will not be answered after business hours, during weekends or holidays.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the

CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

- Please note that the schedule is subject to change throughout the semester. The "Last Updated" Date in the header of the syllabus is meant to reference the current version of the syllabus and therefore should be updated if a change in schedule is made.
- Students should access the current academic calendar for important dates (for example: holidays, course drop, course withdrawal):
  - For the Graduate Center please see: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Registrar/Fall-2015-Academic-CalendarRev.pdf?ext=.pdf
  - For Hunter College please see: http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%205-27-15.pdf

EPI750 & PH820 Course Schedule			
Date of class	**Lecturer**	**Topic**	**Assignments**
September 1, 2015	Kelvin	1. Introduction, basic study design & statistics review	
September 8, 2015	Kelvin	2. Review common measures of effect & Data Analysis*	
September 25, 2015 (Friday)	Kelvin	3. Causal inference in epidemiology 1	
September 29, 2015	Kelvin	4. Causal inference in epidemiology 2	*Computer assignment 1: measures of effect exercise due
October 6, 2015	Kelvin	5. Longitudinal studies (cohort & clinical trials) 1	
October 13, 2015	Kelvin	6. Longitudinal studies (cohort & clinical trials) 2*	
October 20, 2015	Kelvin	7. Case control studies 1	*Computer assignment 2 on longitudinal studies due
October 27, 2015	Kelvin	8. Case control studies 2*	
November 3, 2015	Kelvin	9. Ecological studies & meta analyses	*Computer assignment 3 on case control studies due
November 10, 2015	Kelvin	10. Internal validity: bias and confounding*	
November 17, 2015		11. NO CLASS MEETING	Take home midterm exam due
November 24,	Kelvin	12. External validity & effect	

2015		measure modification/interaction*	
December 1, 2015	Kelvin	13. Measurement of exposure & mediation	Writing assignment due
December 8, 2015	Kelvin	14. Validity and reliability of variables	
December 15. 2015	Kelvin	15. Infectious diseases & independence	Take home final exam due

* Indicates that the SPSS exercise from this class is to be turned-in for grading on the specified date

READING ASSIGNMENTS: (Readings should be completed before the lecture)

CLASS 1 (September 1, 2015): Introduction, basic study design & statistics review
Discussion topic: Why are epidemiologic findings so easily misinterpreted? Is public skepticism warranted? To what extent is it our responsibility to make sure our science findings are properly communicated within public domains?
Assigned Readings: None

CLASS 2 (September 8, 2015): Review common measures of effect & Data analysis
Discussion Topic: What are some of the measures of effect or association that are commonly used in Epidemiology? Are there questions of interest better answered by certain measures of effect than by others?
Assignment: Computer assignment 1 - measures of effect exercise & data analysis.
Due October 6, 2015.
Assigned Readings:

1) Aschengrau text Ch. 2 & 3.
2) Northridge ME. Annotation: public health methods—Attributable risk as a link between causality and public health action. *American Journal of Public Health* 1995; 85:1202-1204.
3) Morabia A. The Essential Tension Between Absolute and Relative Causality *American Journal of Public Health* 2001; 91(3): 335-336
4) Davies HT, Crombie IK, Tavakoli M. When can odds ratios mislead? British Medical Journal 1998; 316: 989-991.

Recommended readings:

1) Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA* 1998; 280: 1690-1691.
2) Schwartz LM, Woloshin S, Dvorin EL, Welch HG. Ratio measures in leading medical journals: structured review of accessibility of underlying absolute risks. BMJ 2006; 333(7581):1248.
3) Stevens J, Cai J, Juhaeri, Thun MJ, Williamson DF, Wood JL. Consequences of the use of different measures of effect to determine the impact of age on the association between obesity and mortality. Am J Epidemiology 1999; 150(4): 399-407.

4) LeardMann CA, Powell TM, Smith TC, Bell MR, Smith B, Boyko EJ, Hooper TI, Gackstetter GD, Ghamsary M, Hoge CW. Risk factors associated with suicide in current and former US Military personnel. JAMA 2013; 310(5): 496-506.

CLASSES 3 & 4 (September 25 & September 29, 2015): Causal inference in epidemiology

Discussion topic: One of the primary purposes of epidemiology is to identify causes of health outcomes. What is a "cause"? How do we identify causes in epidemiology? What are some of the limitations of current epidemiological methods in identifying causes?

Assigned Readings:

1) Aschengrau text Ch.15.
2) Susser text pp. 33-52.
3) Greenland S, Pearl J, Robins, JM. Causal Diagrams for Epidemiologic Research. (1999) Epidemiology; 10(1): 37-48.
4) M Parascandola, D L Weed. (2001) Causation in epidemiology. *J Epidemiol Community Health* 2001;**55**:905–912.
5) Kaufman JS and Poole C. Looking back on "Causal thinking in the health sciences". Annual Review of Public Health 2000; 21: 101-119.
6) Hill AB. The environment and disease: Association or Causation? *Proceedings of the Royal Society of Medicine* 1965; 295-300.
7) Kreiger N. Epidemiology and the Web of Causation: Has anyone seen the spider? *Social Science and Medicine* 1994; 39:887-903.
8) McMichael AJ. Prisoners of the proximate: Loosening the constraints on epidemiology in an age of change. *American Journal of Epidemiology* 1999; 149:887-897.

Recommended readings

1) Taubes G. Epidemiology faces its limits. *Science* 1995; 269(5221):164-169.
2) Susser M, Susser E. Choosing a future for epidemiology: I. eras and paradigms. *American Journal of Public Health* 1996; 86 (5):668-673.
3) Susser M, Susser E. Choosing a future for epidemiology: II. From black box to Chinese boxes and eco-epidemiology. *American Journal of Public Health* 1996; 86 (5):674-677.
4) Feinstein AR. Scientific standards in epidemiologic studies of the menace of daily life. Science 1998; 242: 1257-1263.
5) Schwartz S, Susser E. What can epidemiology accomplish? *International Journal of Epidemiology* 2006; 35(3):587-590.
6) J Pearl. Introduction to Causal Inference – partial article. Int J Biostats 2010; 6: 1-11.

CLASSES 5 & 6 (October 6 & 13, 2015): Longitudinal studies (cohort & clinical trials)

Discussion Topic: What are the strengths and weaknesses of the various longitudinal study designs in assessing causality in general and relative to each other? Where do "natural experiments" fall in the hierarchy of longitudinal study designs?
Assignment: Computer assignment 2 - longitudinal studies. **Due October 27, 2015.**
Assigned Readings:

1) Aschengrau text Ch. 6, 7 & 8
2) Susser text pp. 129-137.
3) Hernan MA. A definition of the causal effect for epidemiologic research. J Epidemiol and Community Health 2004; 58: 265-271.
4) Benson K. Hartz AJ. A comparison of observational studies and randomized, controlled trials. *New England Journal of Medicine 2000*; 342(25):1878-1886.
5) Writing group for the Women's Health Initiative Investigators. Risk and benefits of estrogen plus progestin in healthy postmenopausal women. *JAMA 2002*; 288:321-333.
6) Pedersen AT, Ottesen B. Issues to debate on the Women's Health Initiative (WHI) study. Epidemiology or randomized clinical trials--time out for hormone replacement therapy studies? *Human Reproduction 2003*; 18(11):2241-2244.
7) Berkman LF. Seeing the forest and the trees – from observation to experiments in social epidemiology. Epidemiologic reviews 2004; 26(2): 2-6.
8) Lipsitch M, Tchetgen E, Cohen T. Negative controls: a tool for detecting confounding and bias in observational studies. Epidemiology 2000: 21(3): 383-8.

Recommended readings:

1) Susser E, Hoek HW, Brown A. Neurodevelopmental disorders after prenatal famine: The story of the Dutch Famine Study. *American Journal of Epidemiology 1998*; 147:213-216.
2) Cummins S, Petticrew M, Higgins C, Findlay A. Sparks L. Large scale food retailing as an intervention for diet and health: quasi-experimental evaluation of a natural experiment. *Journal of Epidemiology and Community Health 2005*; 59(12):1035-1040.
3)

CLASSES 7 & 8 (October 20 & 27, 2015): Case control studies
Assignment: Computer assignment 3 - case control studies. **Due November 10, 2015.**
Assigned Readings:

1) Aschengrau text Ch. 9.
2) Susser text pp. 212-225.
3) Morabia A. Case control studies in clinical research: Mechanisms and prevention of selection bias. *Preventive Medicine 1997*; 26:674-677.
4) Bloom MS, Schisterman EF, Hediger ML. Selecting controls is not selecting "normals": design and analysis issues for studying etiology of polycystic ovary syndrome. Fertility & Sterility 2006; 86: 1-12.
5) Susser ES, Schaefer CA, Brown AS, Begg MD, Wyatt RJ. The design of the prenatal determinants of schizophrenia study. *Schizophrenia Bulletin 2000*; 26:257-273.

6) Brown AS, Begg MD, Gravenstein S, Schaefer CA, Wyatt RJ, Bresnahan M, Babulas VP, Susser ES. Serologic evidence of prenatal influenza in the etiology of schizophrenia. *Archives of General Psychiatry 2004*; 61(8):774-780.

CLASS 9 (November 3, 2015): Ecological studies & meta analyses
Discussion Topic: What are the main criticisms of ecologic and meta-analyses study designs, and do you think that these criticisms are warranted? Are these two study designs really worse than the other types of observational studies (cross sectional, cohort, case control, etc) commonly used in epidemiology? Are they always just a poor substitute for other observational study designs?
Assigned Readings:

1) Aschengrau text Ch. 6
2) Rose, G. Sick individuals and sick populations. Int J Epidemiology 2001; 30: 427-432.
3) Pearce N. The ecological fallacy strikes back. *J Epidemiol Community Health* 2000;**54**:326–327.
4) Schwartz, S. The fallacy of the ecological fallacy: the potential misuse of a concept and the consequences. American Journal of Public Health 1994; 84(5): 819-824.
5) Rosenthal R and DiMatteo MR. META-ANALYSIS: Recent Developments in Quantitative Methods for Literature Reviews. Annu. Rev. Psychol. 2001. 52:59–82.

Recommended readings

1) Shapiro, S. Meta-analysis/Shmeta-analysis. Am Journal of Epidemiology 1994; 140(9):771-778.
2) Petitti, DB. Of babies and bathwater. American Journal of Epidemiology 1994; 140(9): 779-782.
3) Greenland, S. Can meta analysis be salvaged? Am Journal of Epidemiology 1994; 140(9): 783-787.

CLASS 10 (November 10, 2015): Internal validity: bias and confounding
Discussion Topic: A study has internal validity when the measure of effect found in that study is the true, correct measure of effect. What are the major factors that threaten internal validity in epidemiology? How can these factors be addressed to improve internal validity when analyzing your data? What are some of the things you need to consider when trying to maximize internal validity during data analysis?
Assigned Readings:

1) Aschengrau text Ch. 10, 11 & 12.
2) Susser text pp. 138-150.
3) Copeland KT, Checkoway H, McMichael AJ & Holbrook RH. Bias due to misclassification in the estimation of relative risk. American Journal of Epidemiology 1977, 105(5): 488-495.
4) Christenfeld JS, Sloan RP, Carroll D & Greenland S. Risk factors, confounding, and the illusion of statistical control. Psychosometric Medicine 2004, 66: 868-875.

5) Brenner H & Blettner M. Controlling for continuous confounders in epidemiologic research. Epidemiology 1997, 8(4): 429-434.

CLASS 11 (November 17, 2015) NO CLASS MEETING
Assignment: **Take Home Midterm Due**

CLASS 12 (November 25, 2015): External validity & effect measure modification
Assignment: Computer assignment 4 - effect modification.
Discussion Topic: What is effect measure modification? What role does the specific measure of effect used (risk difference, risk ratio, odds ratio, etc) play in assessing and interpreting effect modification in epidemiologic data? What are the implications of effect modification for epidemiology and public health?
Assigned readings:
1) Aschengrau text Ch. 13
2) Susser text pp. 319-328.
3) Morabia A., Ten Have T, & Landis JR. (1997) Interaction fallacy. J Clin Epidemiology. 50: 809-812.
4) Morabia A. (2007) Epidemiologic interactions, complexity, and the lonesome death of Max von Pettenkofer. American Journal of Epidemiology. 166(11): 1233-1238.

Recommended readings:
1) Oppenheimer GM & Susser E. (2007) Invited commentary: the context and challenge of von Pettenkofer's contributions to epidemiology. American Journal of Epidemiology. 166(11): 1239-1241.
2) Morabia A. (2007) Morabia responds to "context and challenge of von Pettenkofer's contribution to epidemiology. American Journal of Epidemiology. 166(11): 1242-1243.

CLASS 13 (December 1, 2015): Measurement of exposure & mediation
Discussion Topic: What does the term "mediation" refer to? How does this concept fit into Rothman's conceptual scheme of causation with its INUS causes, if at all? What are some of the issues around identifying mediation in epidemiology as discussed by Terry & Rundle?
Writing Assignment (paper): Is it possible to prove causation in epidemiology? Your paper should include a discussion about what we mean by a cause in epidemiology, how we try to identify causes in epidemiology, with specific reference to the thinking behind the RCT, cohort and case control study designs, and the limitations of epidemiology in identifying causes? – **Due December 2, 2014.**
Assigned Readings:
1) Aschengrau text Ch. 15.
2) Rothman KJ. (1995) Causes. American Journal of Epidemiology, 141(2): 90-95.
3) Hafeman DM, Schwartz S. (2008) Opening the Black Box: a motivation for the assessment of mediation. International Journal of Epidemiology, 38:838–845.

4) Terry MB, Neugut AI, Schwartz S, Susser E. (2000) Risk factors for a causal intermediate and an endpoint: reconciling differences. American Journal of Epidemiology, 151(4): 339-345.

CLASS 14 (December 8, 2015): Validity and reliability of variables
Discussion Topic: What do we mean by validity and reliability as it refers to the measurement of a variable (exposure, outcome, confounder, mediator, or effect modifier)? Why are these two concepts important in assessing causality in epidemiology? What methods can we use to evaluate whether a measurement is valid and reliable and what are some of the weaknesses of these methods?
Assigned Readings:

1) Wu AW, Dave NB, Dierner-West M, Sorensen S, Huang I-C, Rivecki DA. (2004)Measuring validity of self-reported symptoms among people with HIV. AIDS Care, 16(7): 876-881.
2) Kleinman RE, Murphy M, Wieneke KM, Desmond MS, Schiff A, Gapinski JA. (2007) Use of a single-question screening tool to detect hunger in families attending a neighborhood health center. Ambulatory Pediatrics, 7(4): 278-284.

Class 15 (December 15, 2015): Infectious diseases & independence
Discussion Topic: Halloran discusses how infectious diseases are "dependent happenings." What does she mean by this and why is this important in investigating potential causes and protective factors for infectious diseases? According to Halloran, how do infectious diseases differ from non-infectious diseases with regard to dependency of events? Do you agree with her that non-infectious diseases are independent?
Assignment: Take home final exam due
Assigned Readings:

1) Halloran ME. Overview of Vaccine Field Studies: Types of Effects and Designs. *Journal of Biopharmaceutical Statistics*, 2006; 16: 415–427.

Recommended readings

1) Halloran ME Struchiner CJ &. Study designs for dependent happenings. *Epidemiology 1991*; 2(5): 331-338.
2) Halloran ME & Struchiner CJ. Causal inference in infectious diseases. *Epidemiology 1995*; 6(2): 142-151.

NOTE: Additional readings may be assigned throughout the semester.

Last Updated August 27, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
EPI 75100: Epidemiological Methods II:
Survey and Research Methods
3 Credits
Fall 2015

Time and location	Silberman Building, Room 329, Tuesdays 6:05-7:50 PM (except during computer lab sessions, room C08)
Instructor	Assistant Professor, Heidi Jones, PhD MPH Email: hjon@hunter.cuny.edu Phone: 212-396-7750 *Email is the preferred method of communication.*
Office hours	Silberman Building, Room 526 Wednesdays from 4:00-6:00 PM (except during monthly epidemiology seminar) or by appointment
Course website	https://bbhosted.cuny.edu/webapps/blackboard/execute/announcement?method=search&context=course&course_id=_1153017_1&handle=cp_announcements&mode=cpview
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course will provide students with an understanding of the methods used to test research hypotheses; tools for selecting statistical tests appropriate for the particular study design and research hypotheses; and an ability to recognize the importance and impact of threat to validity such as confounding and bias. This course will also cover survey methods used in epidemiologic research.
Course prerequisites	EPI 75000
Course format	While the format for each session will vary, generally we will use the following format: • student questions / review (10 minutes) • lecture (45 minutes) • group work (discussion of articles /in-class exercises - 30 minutes) • review of key take home messages (15 minutes)
Required reading and resources	Szklo M, Nieto FJ. *Epidemiology: Beyond the Basics*. 3rd ed. Burlington, MA: Jones and Bartlett Learning, LLC; 2014.*(on reserve at Silberman library)* Additional assigned articles will be available on Bb.
Suggested reading and resources	Rothman KJ, Greenland S, Lash TL. *Modern Epidemiology.* 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008. *(on reserve)* Elliott RJ, Morrell CH. *Learning SAS in the Computer Lab*. 3rd ed. Pacific Grove, CA: Duxbury Press; 2009. *(on reserve)*

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify key sources of data for epidemiologic purposes	• List major publicly available US datasets • Compare the merits of answering a research question by re-use of existing information or designing a new study.	• Worksheets • In-class Midterm • Take home final
Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	• Explain the intrinsic relationships between common measures of association, such as odds ratio, risk ratio and rate ratio • Calculate effect measure modification on the additive and multiplicative scale • Compare the interpretation of effect measure modification on the additive and multiplicative scale • Explain the difference between age, period and cohort effects • Explain how statistical adjustment works • Calculate an adjusted odds ratio by hand • Assess mediation, explain the limitations of mediation analysis	• Homeworks 1-4 • In-class Midterm • Worksheets • Take home final
Critically read and evaluate the strengths and limitations of epidemiologic literature from a methodologic perspective	• Use directed acyclic graphs to identify confounders and colliders • Identify whether specific research questions require representative samples	• Homeworks 1-4 • In-class Midterm • Worksheets • Take home final

	• Assess public health studies against recognized guidelines	
Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	• Define a cause, explain the strengths and weaknesses of thinking about causality in terms of Rothman's pies, exchangeability or directed acyclic graphs • Explain the difference between a causal factor and a risk factor • Draw directed acyclic graphs showing how loss to follow-up, missing data and misclassification may result in colliding. • Draw the directed acyclic graph for a control exposure and give an example • Compare the causal inferences which can be made from an RCT, an instrumental variable analysis, a cohort study, a case-control study and a cross-sectional study • List all the considerations that affect generalizability of an RCT • Describe key applications of instrumental variable analysis, and key factors which might affect its internal validity • Explain the difference between risk stratification and causal analysis in terms of application and approach	• Homeworks 1-4 • In-class Midterm • Worksheets • Take home final
Identify key threats to validity (internal and external) within and across epidemiologic studies	• Classify biases into structural types and explain how each type of bias may affect an RCT, an instrumental variable	• Homeworks 1-4 • In-class Midterm • Worksheets

	analysis, a cohort study, a case-control study and a cross-sectional study • Calculate the effect of misclassification on measures of association using the concept of sensitivity and specificity • Identify the uses of propensity scores	• Take home final
Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	• Draw a Kaplan Meier plot by hand and using SAS • Calculate an adjusted odds ratio and an adjusted hazard ratio using SAS for a major US survey • Identify the assumptions of Cox proportional hazards regression and interpret a hazard ratio in SAS • Calculate a sample size for a comparison of means and a comparison of proportions in SAS	• Homeworks 1-4 • In-class Midterm • Worksheets • Take home final

Conceptual Framework
The overarching conceptual framework for this course centers on the counterfactual definition of a cause, specifically how this definition is incorporated into observational study design, analysis and interpretation of results, and ultimately our ability to make causal inference.

Course Assessments
Your understanding of the course material will be evaluated through four homework assignments using SAS statistical software (based on in-class laboratory exercises), an in-class midterm, a take home final exam, nine worksheets based on the readings and class participation

Homework: There will be 4 homework assignments based on the in-class SAS exercises for which you will need to analyze data and interpret findings in SAS, and that comprise 30% of your grade.

Exams: There will be an in-class, closed book midterm with short answer questions and hand calculations. There will also be a cumulative take home exam, which will include short answer questions, reviewing a published article, and analyzing and interpreting data in SAS.

Worksheets: There will be 9 worksheets with practice calculations and/or short answer responses to the readings. These worksheets will help to focus your reading of the material and prepare you for class discussions. They will be graded as credit/no credit for completion, and comprise 5% of your grades.

Attendance and class participation: The reading assignments will help you master course materials and actively participate in class; 5% of your grade will be based on your class participation and attendance.

Grading

Evaluation criteria
Homework assignments and exams will be graded based on the extent to which the answers are correct. The worksheets will be graded as credit/no credit. I will use the following rubric for class participation:

Class participation grading rubric (5% of your grade, perfect score=20)*

	Strong work (4-5)	Needs development (2-3)	Unsatisfactory (0-1)
Active listening (5 points)	Actively and respectfully listens to peers and instructors	Sometimes displays lack of interest in comments of others, occasionally 'tunes out'	Projects lack of interest or disrespect for others, checks email, instant messages / text messages, non-course internet material during class time
Preparation (5 points)	Arrives fully prepared with all assignments and reading completed, arrives to class with questions	Sometimes arrives unprepared or with only superficial preparation	Exhibits little evidence of having read or thought about assigned material
Quality of contributions to class discussions (5 points)	Comments and questions frequently help move seminar discussion forward	Comments and questions sometimes advance the discussion, but sometimes do little to move it forward	Comments do not advance the conversation or are actively harmful to it, or student does not participate in class discussions
Attendance (5 points)	Arrives to class on time, does not have unexcused absences	Usually arrives to class on time, informs instructor about unavoidable absences	Arrives consistently late, does not inform instructor about absences

* adapted from: http://www46.homepage.villanova.edu/john.immerwahr/TP101/EvDay/discussion%20rubric.pdf. Accessed on July 21, 2010

The relative weight of each course component is as follows:

Assessment	Weight
Homework assignments (average score)	30%
Midterm (in-class)	30%
Final exam (take home)	30%
Worksheets	5%
Class participation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Class will begin promptly to maximize our time together. Please arrive to class on time, and be prepared to contribute to class discussion. The lectures will be video-taped and made available on Blackboard for excused absences. Please note that group discussions and laboratory exercises will not be taped. Participation and in-class attendance are worth 5% of your grade.

Late/incomplete submission of assignments
Homework assignments are due electronically at 6 PM, prior to the beginning of class. The final exam is due at midnight. **Late assignments will receive 4 points (out of 100) deducted for every day late and NO assignments will be accepted more than 3 days late (i.e. later than 6 PM on Friday).**

Make-ups, rewrites, and extra credit
There will be not be a make-up exam for the in-class midterm. Depending on how the class performs on the midterm, there may be an opportunity for extra credit for this exam; there will not be any other opportunities for extra credit or rewrites.

Expectations of students
Attend lectures & labs, read textbook and articles prior to class, participate during class discussions, seek help/ask questions early and often, provide the instructor with constructive feedback on course material and content, and, hopefully, have fun with the material.

Expectations for the instructor
I will respond to emails within 24-48 hours, excluding weekends. I will tailor the class to your needs and interests depending on the feedback I receive. Generally, I will return graded homework assignments within two weeks (will return them within one week, when possible).

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

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Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

"Green" policies

In an attempt to save paper, homework assignments and the take home final exam will be submitted electronically and will be returned electronically, with comments in track changes. Suggestions for other adjustments to the course to reduce environmental impact are always welcome. Be sure to check your Hunter or Graduate Center email address regularly for class announcements and assignments.

Use of Blackboard

You must sign up for Blackboard to receive course readings, updates and obtain lecture notes and other handouts. For instructions on registering for Blackboard, go to: http://bb.hunter.cuny.edu. Please make sure that you have access to Blackboard through Hunter.

Acknowledgements

This syllabus builds upon courses given by Drs. Sharon Schwartz and Mary Beth Terry, professors in epidemiology at the Mailman School of Public Health at Columbia, and Dr. Luisa Borrell at the CUNY School of Public Health at Lehman College. Additionally, I would like to acknowledge Dr. Mary Schooling at the CUNY School of Public Health at Hunter College, who also teaches this course and has made improvements and adjustments in previous semesters.

Course Schedule

Please note, while the overall content of this course will be covered as outlined, the syllabus may change based on the need to adapt to student interests, feedback and expertise. Always check the Blackboard site for the most up-to-date information on course readings and assignments.

Theme		Date	Topic	Readings and Assignments
Main association between exposure and outcome and causal inference	1	09/01/15	Causation and causal inference	• Rothman, Greenland & Lash, Chapter 2, Causation and causal inference • Broadbent A. Causation and models of disease in epidemiology. *Stud Hist Philos Biol Biomed Sci*. 2009;40:302-11.
	2	09/08/15	RCT and cohort designs; age, period cohort analyses	• Szklo & Nieto, Chapter 1 • Schultz et al. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomized trials. *BMJ*. 2010;340:c332. • Keyes KK et al. What is a cohort effect? Comparison of three statistical methods for modeling cohort effects in obesity prevalence in the United States, 1971-2006. *Soc Sci Med.* 2010;70:1100-8. • **Worksheet 1 due at 6 PM**
		09/15/15 & 09/22/15	No class scheduled	
	3	09/29/15	**Lab 1:** Introduction to SAS, measures of frequency, association and non-parametric survival analysis	• Szklo & Nieto, Chapter 2 & 3 • **Worksheet 2 due at 6 PM** • ***Note: Class will be in Room C08***
	4	10/06/15	Case control studies and sampling design and methods	• Abelson, *Statistics as Principled Argument.* Hillsdale, NJ: Lawrence Erlbaum Associates; 1995, Chapter 1, Making claims with statistics. • Walker. Reporting the results of epidemiologic studies. *Am J Public Health*. 1986:76:556-8. • Outlaw et al. Using motivational interviewing in HIV field outreach with young African American men who have sex with men: A randomized clinical trial. *Am J Public Health*. 2010:100:S146-51 • **Worksheet 3 due at 6 PM**
	5	10/13/15	**Lab 2:** Sample size and power in SAS	• Kelsey, Whittemore, Evans & Thompson. *Methods in Observational Epidemiology*. New York, NY: Oxford University Press, 1996, Chapter 12, Methods of sampling and estimation of sample size.

Theme		Date	Topic	Readings and Assignments
				• Braitman. Confidence intervals extract clinically useful information from data. *Ann Intern Med*. 1988:108:296-8 • Rothman. Significance questing. *Ann Intern Med.* 1986:445-7. • Nuzzo.Statistical errors.*Nature.2014:506:150-2* • **Homework 1 due at 6 PM** • ***Note: Class will be in Room C08***
Threats to internal validity / alternative explanations	6	10/20/15	Selection and information bias	• Szklo & Nieto Chapter 4, • Gradus et al. Acute stress reaction and completed suicide. *Int J Epidemiol* 2010:doi.10.1093/ije/dyq112:1-7 • **Worksheet 4 due at 6 PM**
	7	10/27/15	Confounding	• Szklo & Nieto Chapter 5, • Greenland & Robins. Identifiability, exchangeability, and epidemiological confounding. *Int J Epidemiol* 1986;15:413-9. • Maldonado & Greenland. Estimating causal effects. *Int J Epidemiol* 2002;31-422-29. • **Homework 2 due at 6 PM** • **Worksheet 5: Bring to class 5 sample midterm questions on index cards (with answers on the back)**
	8	11/03/15	MIDTERM	
Strengthening causal inference and hypotheses / causal partners and causal mechanisms	9	11/10/15	Effect measure modification & mediation	• Szklo & Nieto Chapter 6 & App. C, • Hafeman & Schwartz. Opening the black box: a motivation for the assessment of mediation. *Int J Epidemiol.* 2009;38:838-45. • Knol et al. When one depends on the other: reporting of interaction in case-control and cohort studies. *Epidemiology*. 2009:20:161-66 • Suzuki, Yamamoto & Tsuda. Identification of operating medication and mechanism in the sufficient-component cause framework. *Eur J Epidemiol* 2011:26:347-57. • Van der Weele. Subtleties of explanatory language: what is meant by "mediation"? *Eur J Epidemiol.* 2011;26:343-6. <u>Optional:</u> • Kaufman. Interaction reaction. *Epidemiology*. 2009:20:159-60 • **Worksheet 6 due at 6 PM**

Theme		Date	Topic	Readings and Assignments
	10	11/17/15	**Lab 3**: Data analysis for confounding, mediation and effect measure modification	• Ahlbom A, Alfredsson L. Interaction: a word with two meanings creates confusion. *Eur J Epidemiol*. 2005;20:563-4 • Andersson T et al. Calculating measures of biological interaction. *Eur J Epidemiol.* 2005;20:575-9. • Karp. Getting started with proc logistic. *SUGI* Paper 26. <u>Optional:</u> • Szklo & Nieto chapter 7 • **Worksheet 7 due at 6 PM** • ***Note: Class will be in Room C08***
	11	11/24/15	**Lab 4:** Cox proportional hazards model, adjusted SEs using SUDAAN	• Szklo & Nieto Chapter 7 • Smith et al. Survival analysis using cox proportional hazards modeling for single and multiple event time data. *SUGI* Paper 28 <u>Optional:</u> • Clark et al. Survival analysis Part 1: basic concepts and first analyses. *Brit J Cancer* 2003;89:232-8. • Bradburn et al. Survial analysis Part 2: multivariate data analysis – an introduction to concepts and methods *Brit J Cancer* 2003;89:431-6 • ***Note: Class will be in Room C08***
	12	12/01/15	Directed Acyclic Graphs (lab) **Worksheet 8 in class**	• Hernán et al. Causal knowledge as a prerequisite for confounding evaluation: an application to birth defects epidemiology. *Am J Epidemiol*. 2002;155:177-84. • Shrier et al. Reducing bias through directed acyclic graphs. *BMC Med Res Meth.* 2008;doi:10.1186/1471-2288-8-70. • Yang et al. Serum folate and cancer mortality among US adults: findings from the NHANES. *Cancer Epidemiol Biomarkers Prev* 2009;18:1439-47. • **Homework 3 due at 6 PM** • ***Note: Class will be in Room C08***
	13	12/08/15	Instrumental variables	• Rassen et al. Instrumental variables I: instrumental variables exploit natural variation in nonexperimental data to estimate causal relationships. J *Clin Epidemiol*. 2009:62:1226-

Theme		Date	Topic	Readings and Assignments
				32 • Glymour et al Does childhood schooling affect old age memory or mental status? Using state schooling laws as natural experiments. *J Epidemiol Community Health.* 2008;62:532-7. • Wong et al. Estimating influenza vaccine effectiveness in community-dwelling elderly patients using the instrumental variable analysis method. *Arch Intern Med*. 2012;172:484-91 • Voight et al. Plasma HDL cholesterol and risk of myocardial infarction: a mendelian randomization study. *Lancet*. 2012:380:572-80. <u>Optional:</u> • Rassen et al. Instrumental variables II: instrumental variable application-in 25 variations, the physician preference generally was strong and reduced covariate imbalance. *J Clin Epidemiol* 2009:62:1233-41. • **Worksheet 9 due at 6 PM** • **Homework 4 due on 5/11 at 11:59 PM**
	14	12/15/15	Final review	Come prepared to ask questions
	15	12/22/15	No class	Take home FINAL DUE at midnight

For additional information on the academic calendar, please see:
http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%205-27-15.pdf

Last Updated Jan 28, 2016

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
BIOS 75000: Applied Biostatistics I
3 Credits
Spring 2016

Time and location	Thursday, 6:05-7:50 pm, Silberman (2180 3rd Ave), Room C05/C06
Instructor	Hongbin Zhang, PhD CUNY School of Public Health 55 West 125th Street, Room 806 Phone 646-664-8375 hongbin.zhang@sph.cuny.edu (preferred contact)
Office hours	by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	A follow up course to PH 7500/75100 and PH 75200/75300, covering intermediate-level statistical methods commonly used in public health research. Topics include: simple and multiple linear regression; logistic regression; residual analysis; variable selection. Focus on practical applications, utilizing statistical software.
Course prerequisites	PH 750/751 and PH 752/753 or equivalents
Course format	This course is taught with a combination of lectures and in-class computer exercises using SAS. All materials are available on the course website.
Required reading and resources	Ford AC, et al. 2005. *American Journal of Epidemiology* 162:454-460. Hall SL, Greendale GA, 1998. *Calcified Tissue International* 63:183-189. Simanek AM, Dowd JB, Aiello AE. 2009. *International Journal of Epidemiology* 38:775-787. Wisborg K, et al. 2001. *American Journal of Epidemiology* 154:322-327.
Suggested reading and resources	Fox J. *Applied Regression Analysis and Generalized Linear Models. Third Edition*. Sage Publications; 2015. ISBN-10: 1452205663, ISBN-13: 978-1452205663. (Second Edition is also all right.)

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	***After successfully completing this course, you are expected to be able to:***	***Competencies and learning objectives will be assessed as part of the following course assignments:***
Biostatistics-track Competencies		
Describe assumptions, procedures, strengths and limitations of statistical methods that are used in public health research	• Describe and explain the model equations, assumptions of linear regression and logistic regression • Understand the difference of estimation procedures of linear regression and logistic regression	• Mid-term and Final Examinations • Homework 1 & 2
Select statistical methods that are suitable for different purposes of analysis and different types of data	• Understand the difference between continuous outcome and binary outcome; • Able to decide the type of model to use for confounding model or for prediction model; • Compare different methods for identifying confounders	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Apply statistical methods correctly in public health research	• Set up linear regression and logistic regression models that are suitable for the data and research question*	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Use information technology and computer software effectively for management, analysis of public health data	• Use SAS to do basic data management; • Use SAS to conduct linear regression and logistic regression	• In-class Computer Exercises • Research Notes 1 & 2
Accurately describe computer outputs of those analyses and	• Interpret results of linear regression and logistic regression analyses; assess the	• Mid-term and Final Examinations • Homework 1 & 2

appropriately interpret the statistical results	extent to which the results support the initially proposed hypothesis; • Compare the interpretation of absolute and relative risk • Apply methods to determine effect modification, including homogeneity and expected versus observed • Evaluate the predictive accuracy and reliability of the results; and examine if the results are consistent with the statistical assumptions of the methods and models	• Research Notes 1 & 2
Write scientific reports of statistical analyses correctly	• Write scientific reports of linear regression and logistic regression analyses, with properly formatted and labeled tables and figures; • Write scientific reports of linear regression and logistic regression analyses, with essential components • Discuss planning and evaluating epidemiologic studies, threats to validity and value of the inferences drawn from these studies	• Research Notes 1 & 2
Summarize correctly and critically evaluate statistical analyses in published literature	• Correctly summarize results of linear regression and logistic regression analyses in published literature, and critically evaluate statistical aspects of the research*	• Research Notes 1 & 2

Epidemiology-track Competencies

Identify key sources of data for epidemiologic purposes	• Describe the design of major US surveys (NHANES) and explain how this affects analysis of the survey • Conduct a web search to identify publicly available population-based health data to answer research questions	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	• Compare the interpretation of absolute and relative risk • Apply methods to determine effect modification, including homogeneity and expected versus observed • Explain additive and multiplicative effect modification • Apply descriptive and analytic statistics to describe the distribution of health conditions using publicly available data • Test hypotheses regarding associations of health with environmental, demographic, social and economic factors using publicly available data. • Use confidence intervals and p-values to assess statistical uncertainty using publicly available data	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	• Compare different methods for identifying confounders • Compare the biases generated by colliders and confounders • Discuss planning and evaluating epidemiologic studies, threats to validity	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2

	and value of the inferences drawn from these studies • Construct a data analysis plan for a publicly available dataset that is appropriate given the study design used to collect that data and the research question being addressed	
Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	• Identify the type of data to be analyzed • Implement descriptive and analytic analyses in SPSS • Select appropriate statistical methods for the data type and the research question	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2

Course Assessments

Descriptions on details about the assignments and grading criteria will be shown on the course website

Mid-term Examination: Students will take an in-class examination, solving technical and computational problems that are mostly related to linear regression analysis.

Final Examination: Students will take an in-class examination, solving technical and computational problems that are mostly related to logistic regression analysis.

Homework 1: Students will solve a set of technical and computational problems that are mostly related to linear regression analysis and submit the answers.

Homework 2: Students will solve a set of technical and computational problems that are mostly related to logistic regression analysis and submit the answers.

Research Note 1: A subset of data from a health survey will be provided. Each student will develop a hypothesis that could be investigated with the data, analyze the data using linear regression, and write a research report.

Research Note 2: A subset of data from a health survey will be provided. Each student will develop a hypothesis that could be investigated with the data, analyze the data using logistic regression, and write a research report.

In-class Computer Exercises: During the last 30~40 minutes of most classes, students will do computer exercises using computer terminals in C08, and upload their output files onto the assigned location of Discussion Board of the course website or submit them to the instructor by email after the class. The output files may be edited to remove results with errors.

Class Participation: Students should actively participate in the classes by asking questions to the instructor and orally responding to questions from the instructor during the lecture and in-class exercise.

Grading

Evaluation criteria

Evaluation criteria for research notes are described in the assignment instructions, which will be posted on the course website. Homework and in-class examinations are assessed primarily with respect to the accuracy of answers and the appropriateness of the approach adopted to solve the problems. Class participation is assessed in terms of the quality and frequency of questions and replies; and the in-class computer exercises completeness.

The relative weight of each course component is as follows:

Assessment	Weight
Mid-term in-class examination	20%
Final in-class examination	20%
Research note 1	20%
Research note 2	20%
Homework 1	5%
Homework 2	5%
In-class exercise and class participation	10%
	100%

The grading system for the course is as follows:

Letter Grade	Quality Points	Percentage
A+	4.0	97.0 - 100
A	4.0	93.0 - 96.9
A-	3.7	90.0 - 92.9
B+	3.3	87.0 - 89.9
B	3.0	83.0 - 86.9
B-	2.7	80.0 - 82.9
C+	2.3	77.0 - 79.9
C	2.0	70.0 - 76.9
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the

student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Attendance is required. No student will get a full point for "in-class exercise and class participation" if s/he misses more than 3 classes or the number of in-class exercise outputs that are not submitted in time is 3 or more.

Late/incomplete submission of assignments

Late/incomplete submission of Research Notes is not accepted. Late submission of Homework is not accepted. In-class exercise outputs are accepted if they are submitted by the end of the class or within 4 days after the class.

Make-ups, rewrites, and extra credit

With permission of the instructor, students may be allowed to resubmit research notes, homework assignments, and in-class computer exercise outputs before the due date.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Classes are offered in a computer laboratory. During the class, NEVER do any email work or website browsing unrelated to the class.
- Complete all assignments by their assigned due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- There is no group discussion in this course, but students are expected to participate actively in the classes, by asking scientific and technical questions to the instructor if there are any unclear issues, and by responding to questions from the instructor.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

- Because in-class exercise outputs and homework assignments 1 and 2 are not returned with corrections or comments, students are expected to compare their outputs and answers with the model scripts/outputs and answer keys that will be posted on the course website.

Expectations for the instructor

- Provide course materials (including presentation files, data files, computer programs, assignment instructions, copies of or links to articles in the required reading list), regular announcements, reminders, suggestions on the course website.
- Answer questions asked by students during the class.
- Respond to students' email inquiries within 2 days.
- Provide students with individualized in-person instructions during their appointment visits.
- Communication about grades and progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

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Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Readings/Resources	Assessment
1	2/4	Introduction to multiple linear regression 1: Basic models and partial regression coefficients (Part 1)	JF 5	ICE
2	2/11	Introduction to multiple linear regression 1: Basic models and partial regression coefficients (Part 2)	JF 5; HG	ICE
	2/18	Last day to drop without a grade of "W"		
3	2/25	Introduction to multiple linear regression 2: Categorical independent variables	JF 7.1-2	ICE
4	3/3	Introduction to multiple linear regression 3: Ordinary least squares and R^2	JF 5	ICE
5	3/10	Introduction to multiple linear regression 4: Statistical inference.	JF 6.1-2	ICE Homework 1 assigned
6	3/17	Issues in regression analyses 1: Examination of hypotheses on causal relationships I. Explanation of RN1. HW1 answers	JF 6.3 & 1.2	Homework 1 due Research Note 1 assigned
7	3/24	Issues in regression analyses 2: Nonlinearity (Mid-term in-class examination)	JF 12.3	Mid-term in-class examination
8	3/31	Introduction to logistic regression 1: Basic models	JF 14.1	ICE
9	4/7	Introduction to logistic regression 2: Adjusted odds ratio	JF 14.1; AF; KW	ICE Research Note 1 due
	4/11	Last day to withdraw with a grade of 'W'		
10	4/14	Issues in regression analyses 3: Interaction	JF 7.3	ICE
11	4/21	Introduction to logistic regression 3: Maximum likelihood estimation.	JF 14.1.4-5	
	4/28	Spring Recess (no class)		
12	5/5	Issues in regression analyses 4: Examination of hypotheses on causal relationships II.	SDA	ICE Homework 2 assigned

				Research Note 2 assigned
13	5/12	Introduction to logistic regression 4: Ordinal and polytomous logistic regression.	JF 14.2	ICE Homework 2 due
14	5/19	(Final in-class examination)		Final in-class examination
15	5/26	Issues in regression analyses 5: Multi-collinearity, stepwise regression, partial and part correlation	JF 13	ICE
	5/28			Research Note 2 due

Keys: AF = Ford et al. 2005; HG = Hall & Greendale 1998; ICE = In-class computer exercise; JF = recommended textbook by John Fox; KW = Wisborg et al. 2001; SDA = Simanek Dowd & Aiello 2008.

Spring 2016

STAT 752: Analysis of Categorical Data

Meeting times: Thursdays 7:35 – 9:25 pm, Room E920

Instructor: Dobrin Marchev

Email: dm1901@hunter.cuny.edu

Learning Outcomes
We will begin with a review of the binomial and multinomial probability distributions, and the basic principles of estimation and hypothesis testing. These tools will be applied first to statistical inference in two-way contingency tables, then to logistic regression and log-linear models. Generalized linear models will be presented as a unifying framework. The emphasis throughout will be on the application of statistical methods rather than theory.

Prerequisite
C or better in STAT 614 or STAT 750 or BIOS 750 on an equivalent statistics course.

Textbook
"An Introduction to Categorical Data Analysis" by Alan Agresti, 2nd edition, 2007

Software
Many examples will be given implemented using the R package. It can be downloaded for free from http://www.r-project.org/
However, you are free to use any other statistical software you wish.

Grading Policy
There will be regular weekly homework assignments worth 60% of the grade. The remaining 40% are based on the final exam at the end of the course including both in-class and take-home components.

Incomplete and Credit/Non-Credit
Students wishing to *request an INC grade* must do so in writing explaining the reasons, AND have AT LEAST a C average. Students wishing to *request a CR/NCR grade* must have taken the exams, and have at least a 40% average.

Policy on Cheating
Cheating is an extremely serious offense. You are encouraged to discuss homework problems with your classmates, but all work submitted must be your own. If multiple students turn in identical solutions, all of them will receive a zero. Collaboration on the exam is strictly prohibited. Any students who work together on the final will be given a score of zero. Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

BIOS77001: Applied Biostatistics III

3 Credits
Spring 2016

Time and location	Tuesdays 4.15-6.15 pm Room C196.02 (Graduate Center)
Instructor	Katarzyna Wyka, PhD: kwyka@hunter.cuny.edu (response time 24-48 hours)
Office hours	Mondays 4.30-6PM (room 537, Silberman Building) or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	An advanced biostatistics course that focuses on mixed models, GEE for analysis of correlated data, management of missing data and imputation, propensity scoring, and causal inference.
Course prerequisites	BIOS 75100 and EPI 75100
Course format	This is a lecture-lab course. Topics are presented by the instructor and labs are completed by students during class. All materials are posted on Blackboard. Students complete data analysis projects and present their analyses in class.
Required reading and resources	Data Analysis Using Regression and Multilevel/Hierarchical Models by Andrew Gelman and Jennifer Hill. Paperback: 648 pages Publisher: Cambridge University Press; 1 edition (December 18, 2006) ISBN-10: 052168689X ISBN-13: 978-0521686891 Price on Amazon.com: $55.20
Suggested reading and resources	Access to SAS and R statistical software. Additional readings are listed under Course Schedule on p. 5.

Program Competencies	**Course Learning Objectives**	**Relevant sessions and assignments**
This course will help you:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed as part of the following course assessments:
Describe assumptions, procedures, strengths and limitations of statistical methods that are used in public health research	• Explain the assumptions necessary for statistical inference in Generalized Estimating Equations (GEE), Generalized Linear Mixed Models and instrumental variable framework • Reflect intelligently on the limitations inherent in both the data under study as well as the statistical methods used to analyze the data	Reports 1, 2 and 3
Select statistical methods that are suitable for different purposes of analysis and different types of data	• Compare and contrast the similarities and difference of intermediate - statistical methods and their use in addressing various research questions	Reports 1, 2 and 3
Apply statistical methods correctly in public health research.	• Show competency in techniques related to the analysis of correlated public health data • Implement instrumental variable analysis and propensity score matching analysis and explain their relevance to causal inference • Implement and interpret a meta-analysis • Apply statistical techniques related to missing data problem • Show competency in assessing model fit and model building	Reports 1, 2 and 3
Use information technology and computer software effectively for collection, management, analysis and presentation of public health data.	• Master the use of statistical software for collection, management and analysis of public health data	Reports 1, 2 and 3
Accurately describe computer outputs of these analyses and appropriately interpret the statistical results	• Interpret computer output from GEE, mixed models and instrumental variable analyses • Interpret computer output from missing data imputation problems	Reports 1, 2 and 3
Write scientific reports of statistical analyses correctly with tables and figures.	• Produce data analysis reports of the highest quality as to their conciseness, readability and cohesion • Create appropriate tables and figures that adequately convey the key points of statistical analysis	Reports 1, 2 and 3
Orally present statistical findings clearly and effectively.	• Present your findings orally clearly and effectively • Incorporate feedback into an improved data analysis report after in class “peer review”	Reports 1, 2 and 3
Summarize correctly and critically evaluate statistical analyses in published literature.	• Identify research questions posed in published reports • Critique the analytic approach and data presentation in published research	Reports 1 and 2

Last updated 1.29.15

Course Assessments

Your understanding of the course material will be evaluated through a total of three (3) data analysis reports. Each report will consist of 3 problems. Master level students should choose 2 out of 3 problems. Each student will be expected to present his/her results in class and actively participate in the constructive critique/review of the work of his/her peers. You will have the chance to revise and resubmit each report after the first round of critique/review. This will give you the chance to deepen your analysis and bolster your mastery of the statistical methods.

Grading

Evaluation criteria
All assignments will be evaluated based upon rubrics found on the course website.

The relative weight of each course component is as follows:

Assessment	Weight
Report 1	30%
Report 2	30%
Report 3	30%
Attendance and class participation	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Regular weekly attendance is strongly advised. Your absence is detrimental not only to your performance but also to that of your colleagues, who benefit from your important feedback during in-class discussions.

Late/incomplete submission of assignments
- Late reports will not be accepted under any circumstance.
- A full letter grade will be deducted if a student fails to show up on the day his/her data analysis presentation is scheduled.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students
- Check email and Blackboard announcements on weekly basis
- Access course materials on weekly basis
- Complete and submit reports on time
- Participate in class discussion board

Expectations for the instructor
- Provide regular announcements and reminders on the course website and via email
- Respond to student email within 24-48 hours Monday through Friday
- Grade and provide feedback on assignments within 1 week of the due date
- Communicate grades and progress through Blackboard (My Grades)

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Last updated 1.29.15

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

The preliminary schedule of lectures below is meant to serve as a guide. Depending on the class needs, interests, and progress during the semester, some topics may be given more or less class time than others. Accordingly, the scheduling of in-class presentations and the due dates of reports may vary.

Important dates

- LAST DAY TO DROP CLASS WITH THE GRADE OF "WD": February 18th
- LAST DAY TO DROP CLASS WITH THE GRADE OF "W": April 11th

Refer to the current academic calendar for other important dates.

Date	Lecture	Topic	Reading & Assignments
2/2	#1	**Models for correlated data** Extending GLM: Generalized Estimating Equations (GEE) • Models for Continuous outcomes • Models for Binary outcomes Generalized Linear Mixed Models (GLMM) • Variance components • Random intercept model	Gelman & Hill chapter 12 Diez-Roux AV. Multilevel analysis in public health research. Annual Review of Public Health 2000; 21:171-92. Hubbard AE, Ahern J, Fleischer NL, Van der Laan M, Lippman SA, et al. To GEE or Not to GEE. Comparing population average and mixed models for estimating the associations between neighborhood risk factors and health. Epidemiology 2010; 21:467-474. Online resources for GLMM
2/16	#2	**Models for correlated data** Generalized Linear Mixed Models (GLMM) • Random intercept and slope • Strategies for Model Building	Gelman & Hill chapter 13.1-13.2, 13.4-13.5 Singer J. Using SAS Proc Mixed to fit multilevel models, hierarchical models, and individual growth models. Journal of Educational and Behavioral Statistics 1998; 24:323-355. Gary-Webb TL, Baptiste-Roberts K, Pham L, Wesche-Thobaben J, Patricio J, et al. Neighborhood and weight-related health behaviors in the Look AHEAD (Action for Health in Diabetes) Study. BMC Public Health 2010; 10: 312.

2/23	#3	**Models for correlated data** Generalized linear mixed models (GLMM) • Multilevel logistic regression • Diagnostics for GLMM	Gelman & Hill chapter 14.1-14.2 Ene M, Leighton EA, Blue GL, Bell BA. Multilevel Models for Categorical Data Using SAS Proc GLIMMIX: SESUG 2014, Paper 134-2014.
3/1	#4	**Models for correlated data** Generalized linear mixed models (GLMM) • Models for longitudinal data • Mediation analysis	Gelman & Hill chapter 11.3 Landerman RL, Mustillo SA, Land KC. Modeling repeated measures of dichotomous data: testing whether the within-person trajectory of change varies across levels of between-person factors. Social Sciences Research 2011; 40(5), 1456-1464. Valeri L, VanderWeele TJ. Mediation analysis allowing for exposure-mediator interactions and causal interpretation: theoretical assumptions and implementation with SAS and SPSS macros. Psychological Methods 2014; 18(2): 137-150.
3/8	#5	**Meta-Analysis** • Fixed vs. random effects models • Reporting the results of meta-analysis • Criticism of meta-analysis	Vandenbroucke JP, von Elm E, Altman DG, Gotzsche PC, Mulrow CD, et al. Strengthening the reporting of observational studies in epidemiology (STROBE): Explanation and elaboration. Annals of Internal Medicine 2007; 147:163-194. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic Review Journal 2015; 4:1. Lies, Damned Lies, and Medical Science, November 2010 ATLANTIC MAGAZINE http://www.theatlantic.com/magazine/archive/2010/11/lies-damned-lies-and-medical-science/8269/
3/15	#6	**Report 1 discussion**	**Report 1 draft due**
3/22	#7	**Causal Inference-review** • Causal Inference in Experimental designs & Observational studies • Propensity score matching	Gelman & Hill chapter 9, 10.1-10.4 Little R, Rubin D. Causal effects in clinical and epidemiological studies via potential outcomes: concepts and analytical approaches. Annual Review of Public Health 2000; 21:121–45. Austin PC. An introduction to propensity score methods for reducing the effect of confounding in observational studies. Multivariate Behavioral Research 2011; 46:399-424. **Report 1 due**

3/29	#8	**Casual inference-Instrumental variables** • Definition of Instrumental Variables • Instrumental variables in regression framework	Gelman & Hill 10.5-10.6 Greenland S. An introduction to instrumental variables for epidemiologists. International Journal of Epidemiology 2000; 29: 722-729. Hirano K. Imbens GW, Rubin DB, Zhou XH. Assessing the effect of an influenza vaccine in an encouragement design. Biostatistics 2000; 69-88.
4/5	#9	**Casual inference-Instrumental variables (online)** • Pitfalls (e.g. problem of weak instruments) • Introduction to Mendelian randomization	Hernan MA, Robins JM. Instruments for causal inference - An epidemiologist's dream? Epidemiology 2006;17(4): 360-372. Davey Smith G, Ebrahim S. Mendelian randomization: can genetic epidemiology contribute to understanding environmental determinants of disease? International Journal of Epidemiology 2003; 32: 1-22.
4/12	#10	**Casual inference-Instrumental variables** • Clustered Encouragement designs • Regression Discontinuity designs	Gelman & Hill 10.4 Taylor L, Zhou X. Methods for clustered encouragement design studies with noncompliance and missing data. Biostatistics 2011; 12(2): 313-326. Pennell ML, Hade EM, Murray DM, Rhonda DA. Cutoff designs for community-based intervention studies. Statistics in Medicine 2011; Vol 30(15), 1865–1882.
4/19	#11	**Report 2 discussion**	**Report 2 draft due**
4/26	#12	**Missing data analysis** • Missing data mechanisms • Simple techniques (listwise deletion, available case, LVCF, mean imputation, dummy variable methods) • More advanced techniques (weighting, hotdecking)	Gelman & Hill 25.1-25.6 Donders AR, van der Heijden, Stijnen T, Moons KG. Review: A gentle introduction to imputation of missing values. Journal of Clinical Epidemiology 2006; 59: 1087-1091. **Report 2 due**
5/3	#13	**Missing data analysis** • Building blocks of multiple imputation (regression imputation, regression imputation with noise)	Su Y, Gelman A, Hill J, Yajima M. Multiple imputation with diagnostics (mi) in R: Opening windows into the Black Box. Journal of Statistical Software; 2011, 45 (2)
5/10	#14	**Missing data analysis** • Multiple imputation in practice • Diagnostics	
5/17	#15	**Report 3 discussion**	**Report 3 due**

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

COMHE 75000: Community Health Assessment
3 Credits
Spring 2016
Last Updated: February 3, 2016

Time and location	Silberman 219 Tuesdays 6:05-7:50 pm
Instructor	Sandra E. Echeverria, PhD, MPH Associate Professor and Program Director Sandra.Echeverria@hunter.cuny.edu (best way to reach me) Silberman Room 529 (212) 396-7740
Office hours	By Appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course prepares students to collect and analyze data on community health from a variety of sources, to identify problems and assets, and to develop objectives for community health interventions.
Course prerequisites	PH 75500
Course format	Lecture with applied sessions in computer lab
Required reading and resources	Hodges, Bonnie C & Videto Donna M. Assessment and Planning in Health Programs. 2nd edition. Jones & Bartlett. 2011. Other articles available on BlackBoard
Suggested reading and resources	See last page

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply social and behavioral theory and evidence to assess, plan, implement and evaluate community health programs, policies and interventions that promote health equality and reduce inequities.	• Compare and prioritize health issues for action and community resources and capacity, based on epidemiological evidence, equity, feasibility and other considerations • Identify community level health and social indicators and specify whether appropriate tracking data exist or need to be collected	• Community map • Community profile
Demonstrate team building, negotiation, and conflict management skills in community health interventions.	• Design a process for establishing community or organizational health priorities and strategies through community dialogue • Identify and incorporate principles of CBPR into a community health assessment • Formulate an assessment planning model that ensures participation for key community constituencies including beneficiaries of anticipated health promotion efforts • Describe the power dynamics involved in a particular community collaboration, the importance of these dynamics, and ways of addressing them	• Community Impression • Community Tour • Community Board Meeting
Use qualitative and quantitative research methods to generate insight into community health issues.	• Locate, analyze and interpret community-level qualitative and quantitative data on health from a variety of sources • Construct and deliver a presentation on the health of a community (overall or with respect to specific health	• Community Tour • Community Map and Community Profile

	issues) that synthesizes data from multiple sources and incorporates community perspectives • Design, conduct and interpret community level qualitative research, using ethnographic observation, in-depth interviews and content analyses, using community sourced documents or texts	• Quantitative Instrument • Qualitative Instrument
Apply ethical, socially just, and culturally competent principles and strategies to community organizing, community health assessment, program planning, implementation and evaluation.	• Practice reflexivity with respect to one's own social position vis a vis the community being assessed.	• Community Impression

Course Assessments

You will be assigned to a community district which will be the subject of the following assignments: community impressions, community tour and community board meeting, community map and community profile, instrument development and your oral presentation. Despite being assigned in groups to districts, the only assessments that should be done as a group are the community map, preliminary community profile, and the final CHA report. The oral presentation should also be done as a group but you will receive an individual grade. All other assessments should be completed independently and without the help of group members. The page limits are listed below for each assignment do not include tables, figures or references. Please keep these at the end of your papers so I am able to easily assess if you are within the page limits. To be clear, a page length of 4-6 pages means at least 4 pages but no more than 6 pages (so it ends somewhere on the fifth or sixth page). All written assignments will be scanned in BlackBoard for plagiarism via SafeAssign. You will be able to review your score. You will have 2 attempts to upload each assignment to BlackBoard (so if you receive a high score for copied text in the first submission, not related to quotes or citations, it is up to you to review and edit and resubmit before the deadline). Allow yourself time for potential revisions before the deadline.

Your district is designed to be a community that you don't work or live in. It will likely take you some time to commute to your community district but you only need to do this once if you conduct the tour on the same day as the board meeting. You will be given a "free" class for the time it will take to visit your community.

1. Community Impressions (reflexive exercise):

In qualitative research, we often engage in reflexive exercises to understand how our own biases may impact our research. Reflexivity is "acknowledging the existence of researcher bias and explicitly locating the researcher within the research process" (Finlay). It emphasizes the importance of self-awareness and self-questioning. It is an ongoing process to understand "what I know and how I know it" (Patton). In this way, before you plan your walking tour of the community, write down your impressions of the community to which you have been assigned. Articulate how you think you developed these thoughts (press, movies, discussions, etc.) and how these impressions could impact your assessment of the community.

DUE DATE: February 23, 2016
Length: 2-3 pages (not including references, tables or figures)

2. Preliminary Community Profile and Community Map

This assignment involves the preliminary data gathering for the final CHA report and a creative exercise to construct a community needs and assets map for your assigned community. This work will be done in groups and only one community profile and community map will be handed in by each group. The specific elements of each are describe below.

Preliminary Community Profile:

a. **Description of the history and physical environment** of the community (who founded the community and when, what is it like today, physical boundaries, names and roles of major institutions in the formation of the neighborhood, historical landmarks, types of housing stock (including rental vs. ownership), types of transportation including names and routes, etc.)

b. **Demographic profile** of the community (race/ethnicity, sex ratio, percentages and numbers of persons in all age categories listed by groups of 5 and younger and then in ten year integers up until 85+.) Note- you do NOT need to present the breakdowns of race/ethnicity and gender by each age category. The table should reflect the % and raw numbers by the following three variables: age (listed by groups of 5 and younger and then in ten year integers up until 85+), gender and race/ethnicity. One way to organize it is in the left hand column of your table to list each of these categories, with the other columns showing their respective % and raw numbers. You can also present these separately in different tables, pie charts, graphs, etc.

c. **Social and economic profile** of the community (religious affiliations, social successes and problems, environmental successes and problems, political affiliations and numbers of voters, types of employment, and numbers of employees and those on public assistance).

d. **Epidemiologic profile** of the community: including a description of the health status of your community, a comparison of rates for the five major causes of death in your community, rates for the five major causes of death in New York City and rates for the five major causes of death in the United States (A possible listing of fifteen major causes of death). Chart format will be provided on BlackBoard. You can use either the age-adjusted rate or the non-adjusted rate for this table. (Age-adjusted is preferable, if available.) Whichever you use, though, be sure that is consistent across your district, NYC and the US- and cited. There must be a written discussion/comparison of data across these three levels.

   LENGTH: 6-8 pages (not including references, tables or figures)

Community Map:

Draw/create **1 or 2** community map(s). One that represents a needs-based approached and one that represents an assets-based approach, or you can make one map that combines both. Use the lecture and reading for examples and as guide for your maps. Your maps should focus on the needs/assets of the community as a whole. In the end be creative, this is an exercise in presenting information in a different format. Think about how you would present this to members of the community you were assigned.

Some suggestions for the maps:

Needs Based Map
- What are the problems facing the community?
- What are the basic needs that are lacking in the community?
- Represents the barriers that people face in that community in order to lead a healthy life
- Orient whoever is looking at the map to the deficits that exist in the community and depending on the strategy used exactly where these deficits are located

Assets Based Map
- What are the assets present in the community?
- How can aspects of the community that may represent a barrier be looked at as an asset?
- What are the other non-economic or physical resources present in the community that can be used to improve health and the condition of the community?
- Are these assets wide-spread or located in particular areas?

LENGTH: No formal write-up is required for the community map. Examples will be shown. You will briefly (1-2 min.) present your "map" to the class on the due date. See instructions posted on BlackBoard.

DUE DATE FOR BOTH COMMUNITY MAP AND PRELIMINARY COMMUNITY PROFILE: April 5, 2016 One (1) Submission per group.

3. <u>Community Tour and Attendance at Community Board Meeting (ethnographic and participant observation exercise)</u>

***Note:** Both assignments A and B below are due on the same day. Students are strongly encouraged to use the 'free' class day to complete the community tour and attend the Community Board Meeting.

A. Community Tour (ethnographic)

Take a walking tour of the community to which you have been assigned. In an expository description, state the day of the week and time of day you walked around the neighborhood and summarize your insights and feelings about walking around the community. Were there any surprises? The description should answer questions such as:

<u>General Observations of the community</u>

1. What kinds of noises do you hear on the street? Where are the noises coming from?

2. Do the streets appear clean? At night, are there working streetlights on the streets?

3. What kind of transportation do people use? How accessible is the neighborhood? What kind of traffic is there?

4. How safe is the neighborhood? Explain your perceptions.

<u>Population</u>

1. Who are the people on the street? Describe their age, gender, race/ethnicity; what languages do you hear spoken? If people are hanging out in groups, note who they are with - - families, intergenerational groups, friends of the same age, race/ethnicity?
2. What are people doing? (Shopping/ "hanging out"/recreational activities) Are there local gathering spots for some people in the community such as parks, cafes, community centers?

3. What are people buying in the neighborhood supermarkets? Do community residents go to specific local restaurants or bars?

4. Does the population of the neighborhood change according to the time of day? Is there a large influx of people from outside the community during business hours (how do you know this)?

<u>Institutions</u>

1. What kind of commercial businesses are in the neighborhood? Are they "small" businesses or franchises?

2. What kind of religious institutions are there in the community?

3. What kind of government offices, schools, libraries, other city-run services exist in the neighborhood? Are the buildings clearly marked and what is the physical condition of the structures?

4. What kind of social service institutions or community groups exist? Are there youth service organizations, community centers, day care or senior centers?

5. What kinds of health services are available in the community? Drug stores? Private doctors offices? Hospitals? Community clinics? Drug treatment centers? Nursing homes? Others?

LENGTH: 2-3 pages (not including references, tables or figures)

B. Attendance at Community Board Meeting (participant observation)
Students are required to attend a community the community to which you have been assigned is mandatory. Access to information about Community Boards can be found by going to the WebPages at *www.nyc.gov*. Meetings generally take place once a month. The following questions must be answered and please provide any additional comments about the Community Board Meeting.

1. Before you attend the meeting, write down your expectations. How many people will attend? What are the topics that will be addressed? What will the site be like? Compare these notes with your actual experience and describe this in your report.

2. Describe the process of finding out when and where the meeting will occur and any concerns or suggestions that you might have about the process. See if you can obtain the minutes of a previous meeting.
3. Note the make-up of the board and of the attendees. Do they reflect the overall makeup of the population? What are the topics on the agenda? What discussions occurred? How are decisions handled?

4. How effective is the mechanism of community boards in reaching out to and learning about community level concerns? Would you attend another meeting? Would you consider becoming more involved in the future? Explain why.

LENGTH: 2-3 pages (not including references, tables or figures)

DUE DATE FOR BOTH ASSIGNMENTS (A and B): April 12, 2016 *(Note: if you are not able to attend a board meeting until after this date, please notify the instructor. You will be given 7 days from the date of the board meeting attended to submit the paper without penalty.)*

4. Quantitative and Qualitative Instruments

In class, we will discuss the importance of using both primary and secondary data collection approaches to conduct a community health assessment. Primary data collection gives us the opportunity to interview community members, community stakeholders, and other key informants about specific topics of interest in the community health assessment process that may not be available through public data (secondary data). Students will gain basic skills in the design of a quantitative instrument to conduct a community health survey, and skills designing a qualitative instrument to conduct a focus group or in-depth interview. Subsequent courses in the COMHE sequence and elective courses will provide students more in-depth coverage of these data collection approaches. This assignment should be completed by each student, not as a group.

1. Quantitative Instrument: develop a close-ended questionnaire comprised of at least 4 health areas (e.g., mental health, physical activity, HIV testing, health insurance coverage and access to care, etc.), 12 questions drawn from the published literature, and a section on social and demographic characteristics. The questionnaire must also include 4-5 questions independently developed by the student. This will give students practice in constructing close-ended questions. The questionnaire should build on the data identified in the community profile, but add new data on a health area not publicly available or for a specific population (e.g., the elderly or adolescents). A brief description of the target population and sampling design for the survey must also be included.

   DRAFT DUE: March 8, 2016
   FINAL VERSION DUE: March 22, 2016

2. Qualitative Instrument: develop an open-ended focus group guide or in-depth interview instrument to interview community members on a specific topic of relevance to the student's assigned community. The qualitative instrument should allow for an in-depth exploration of specific topics that would uncover new meanings and give 'voice' to community members, which is not captured through close-ended questionnaires. The in-depth instrument should include 4-5 open-ended questions with additional 'probes' added as needed. A brief description of the target population and sampling design for the use of the qualitative instrument must be included.

   DRAFT DUE: April 19, 2016
   FINAL VERSION DUE: May 10, 2016

5. Community Health Assessment Final Report

The major course assignment will be a final community health assessment (CHA) report completed by the group. Each student has been assigned a Community District for this semester-long project. Throughout the semester, time will be allotted during

class for you to meet with your fellow classmates who are assigned to your same Community District. All citations and the bibliography must be in AJPH format. The *New York City Department of Health Summary of Vital Statistics* must be included in your reference list.

The final community health assessment report will be a written description of the community. Listings of data or presentation/copying of books/reports without written description are unacceptable. The final report will synthesize all data sources collected about the community with actionable next steps highlighted. The information that **MUST** be included in each section is outlined below.

a. **Preliminary Community Profile.** You will have already completed this section earlier in the semester (Point 2). You simply need to add it to your final report.
b. **Selection of Primary Health Concerns**: Select 3-4 current major public health concerns in your community previously identified in the Preliminary Community Profile (it must be listed in *Healthy People 2020)*. These concerns do not have to be a major cause of death, but what you define as a major public health problem based on your community research. This condition/disease may be one for which there are primary, secondary or tertiary prevention intervention strategies. Describe and justify your choice of the selected public health problems in your community. If you are selecting drug use, please choose a specific drug such as alcohol, heroin, etc.
b. **Review the literature** on your selected public health problem. Define and discuss a) what is it, including its physiologic manifestations? b) What causes it? c) Can it be prevented? d)Who gets it? and e) What are the treatments?
c. **Analysis** of the economic, social and health trends of your community. Identify existing organizational resources (name and type of organizations, scope of services provided, etc.) that help address the needs of the community. Indicate gaps in services.
d. **For your community, write at least two program objectives:** What are the best ways to approach going about reducing the burden of the conditions you have chosen, given all that you know about the area and population that lives in that area? Include a brief overview of the proposed program/intervention your group has developed and list at least two detailed program objectives. Examples on writing program objectives provided on Blackboard.

DUE DATE: May 17, 2016 (One (1) paper per group)
LENGTH: 6-8 pgs (not counting preliminary profile (6-8 pages) and not including references, tables or figures)

6. Oral Presentations:
During the last session of class, each group will present a summary of their assigned community as if they were presenting to their assigned community board. The presentation should highlight 1) a description of what was learned about the community; 2) key health data and health concerns identified; 3) description of the sources used to

find your data and **posting these resources on a google site created by your group** (additional instructions will be posted on Blackboard); 4) community assets/resources; 5) the major health concerns that you identified for how and what they should do reduce the burden of the health concern. Please review the instructions posted on BlackBoard for the oral presentation. Each member of the group needs to present for about 5 minutes, with a total presentation time of 15-20 minutes per group. You will present as a group but receive individual grades.

DUE: May 17, 2016 (You will need to submit your slides by 4 pm on the day of the presentation via BlackBoard. Use of powerpoint slides submitted later will result in a penalty, in fairness to other students.)

Grading

Evaluation criteria

The relative weight of each course component is as follows:

Assessment	Weight
Regular class attendance	5%
Class participation	5%
Community Impressions	5%
Community Tour and Community Board Meeting	10%
Community Profile and Map	25%
Quantitative Instrument	10%
Qualitative Instrument	10%
Community Health Assessment Report (group)	25%
Oral Presentation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Your attendance grade reflects the number of in-class sessions you attend fully and on time. Excessive lateness and absences will be noted and reflected in your final grade. Class will start promptly at 6:05 pm in order to maximize our time together. If you are going to be late or going to miss a session, please inform the instructor via email *prior* to the class. It is your responsibility to obtain the content and assignments for those sessions you miss (network with your classmates). If you miss *more than two* classes you risk receiving a failing grade for this course. Please initiate a meeting with the instructor if you miss three or more courses.

Participation in class discussion and reading material on Blackboard is vital in this course. Your participation grade will reflect consistent, thoughtful contributions to class discussions. Your participation should reflect your reading and understanding or questions related to the assigned reading.

Late/incomplete submission of assignments

All work is expected to be presented on time. 5% will be deducted for each day a written assignment is late. **After one week of lateness you will not receive any credit for that assignment.** In case of extenuating circumstances, please contact me. Please note the following specifications for all assignments: Papers and other assignments are due at the beginning of the class period (6:05pm) via BlackBoard unless otherwise noted. Any assignment submitted at or after 6:06 pm will be considered late. If you anticipate the need to turn in work late, please negotiate with me a mutually acceptable submission plan in advance of the established due date. **DO NOT SEND AN E-MAIL REQUESTING AN EXTENSION ON THE DAY THE ASSIGNMENT IS DUE.** Papers and reports should be kept to the maximum length specified. I will stop reading after the maximum length and you will be marked down, accordingly. It is expected that your writing will be of graduate-level quality, presented in a readable and consistent manner: Times New Roman 12 pt font, double-spaced, typewritten, with one inch margins all around and proof-read. All written assignments should use the American Journal of Public Health reference format (this journal uses AMA style format).

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites or extra credit offered for this course.

Expectations of students

All students must enroll in BlackBoard. BlackBoard will be used on a routine basis as a learning tool to distribute course materials, as well as to facilitate communication with the instructor and classmates. You are expected to check your Hunter email daily for course updates.

The classroom is a community. Respectful interaction with classmates, the instructor and guests is expected at all times. Public health deals with controversial issues from multiple perspectives and consideration of these issues may cause disagreements among us or may evoke strong personal feelings, depending on our individual experiences, histories, identities and worldviews. Therefore, in all of interactions and communications, it is important that students strive to demonstrate mutual respect for one another and for any course guests and members of the community with whom they come into contact.

Please avoid crosstalk, text messaging, and turn off (or set to vibrate) cell phones etc., anything that can be distracting and take away from a climate of mutual learning or attentive listening and participation. Student announcements of related events and opportunities of interest to students may be made at the end of the class. Students should let the instructor know if they have an announcement to make. Feel free to bring refreshments to class for yourself and/or others; but please help clean up afterwards.

Expectations for the instructor

Direct any inquiries to the instructor via e-mail. A response can be expected within 72 hours. Assignments will be graded within two weeks of the due date (unless otherwise stated). I will post lecture slides (if applicable) within 48 hours after our class.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857. If you have special accommodations that are necessary for class sessions, exams or presentations, please let me know at the beginning of the semester.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Help with research and writing: Feedback will be given on the quality of all written assignments. If you require further assistance with improving your writing skills, consider visiting the Student Reading and Writing Center on the main campus. For more information, visit http://rwc.hunter.cuny.edu/ .

Course Schedule

The schedule and assigned readings are subject to change throughout the semester. The "Last Updated" Date in the header references the current version of the syllabus and will be updated if a change in schedule is made. Please refer to the Hunter Academic Calendar for important dates including holidays, course meeting dates and withdrawals.

Please Note: This schedule & assignments are subject to change. Additional readings and handouts may be provided. Check BlackBoard for updates.

Session Date	Topic/Assignments	Readings
Session 1: 2/2	Introductions and Overview Definitions of community & health	Jewkes 1996; Finlay 2002
2/9/2016	NO CLASS- FOLLOWS FRIDAY SCHEDULE	
Session 2: 2/16	Community health assessment (CHA) process overview - Social Justice as organizing principle	Hodges Ch. 1 and 2; Jewkes 1998, Sharma 2003 Recommended: Bronx Community Needs Assessment; RWJ University Hospital Community Health Assessment **Visit by Dr. El-Mohandes, Dean of the CUNY Graduate School of Public Health and Health Policy and Dr. Joshi, CUNY GSPH&HP Dean of Student Services**
Session 3: 2/23	Theories of Health Promotion and Conceptual and Planning Models **Due: Community Impressions**	Hodges Ch. 6; Castellanos 2013; Buta 2011; Morgan 2010
Session 4: 3/1	Data Collection : Quantitative Methods (1) - Overview - Secondary data: national, state-wide, New York City and neighborhood specific	Hodges Ch. 3, Finifter 2005 **Guest Lecturer (TBD)**
Session 5: 3/8	Data Collection: Quantitative Methods (2) Primary data: designing community health surveys, estimating sample size, and practical applications for conducting surveys in community	Echeverria SE et al, 2014. Romero D et al. (Part II), 2010. **Laboratory Session, Silberman Room C06**

Session Date	Topic/Assignments	Readings
	settings **DUE: Draft Quantitative Instrument**	
Session 6: 3/15	Data Collection: Quantitative Methods (3) - Selecting indicators - Selecting comparison groups/ places - Synthesizing and presenting results - Mapping health	Braveman 2003 and 2010 **Laboratory Session, Silberman Room C06**
Session 7: 3/22	Identifying & Employing Community Assets **DUE: Final Quantitative Instrument**	Kretzman 2013; Sharpe 2000; Cacari-Stone 2014
Session 8: 3/29	WORK IN GROUPS- NO CLASS	
Session 9: 4/5	Engaging Communities: CBPR Orientation, "insider" vs. "outsider" perspectives & power dynamics **Due: Community Map and Preliminary Community Profile**	Israel 1998; Minkler, 2004; Kerstetter 2012
Session 10: 4/12	Data Collection: Qualitative Methods (1) - Overview - Integrating qualitative and quantitative (mixed methods designs) **Due: Community Tour & Board Mtg. written assignments**	Ulin Ch. 2; Emerson 1995; Hsieh 2005;
Session 11: 4/19	Data Collection: Qualitative Methods (2) Designing FG and In-depth Interviews **Due: Draft of Qualitative Instrument**	Ritchie Ch. 7; UCLA Section4; Schensul Ch 6 (Israel Ed)

Session Date	Topic/Assignments	Readings
4/26-3/3	NO CLASS- Spring Recess	
Session 12: 5/3	Data Collection: Qualitative Methods (3) Analysis of Qualitative Data	Romero D (Part I), 2010 **Laboratory Session, Silberman Room C06**
Session 13: 5/10	Synthesizing and Prioritizing Health Issues Elements of Final CHA Report **Due: Final Qualitative Instrument**	Gandelman 2006 San Francisco CHA, 2012
Session 14: 5/17	Next Steps after CHA: Program Planning and Implementation	Hodges Ch. 9; Kellog Ch 1 & 2, Van der Weese 2014; Faridi 2007
Session 15: 5/24	**Oral Presentations/ Wrap Up** **Due: FINAL CHA REPORTS**	No reading

READINGS
Required text:

Hodges, Bonnie C & Videto Donna M. Assessment and Planning in Health Programs. 2nd edition. Jones & Bartlett. 2011.

Other required readings:
Braveman PA, Cubbin C, Egerter S, Williams DR, Pamuk E. Socioeconomic Disparities in Health in the United States: What the Patterns Tell Us. *AJPH.* 2010;100:S186–S196.

Braveman PA, Gruskin S. Defining equity in health. *J Epidemiol Community Health* 2003;57:254–258.

Buta B, Brewer L, Hamlin DL, Palmer MW, Bowie J & Gielen A. An innovative faith-based healthy eating program: from class assignment to real-world application of PRECEDE/PROCEED. *Health Promotion Practice 2011*. 12 (6): 867-875.

Cacari-Stone L et al. The Promise of Community-Based Participatory Research for Health Equity: A Conceptual Model for Bridging Evidence With Policy. American Journal of Public Health. 2014. Published online ahead of print July 17, 2014: e1–e9

Castellanos DC, Downey L, Graham-Kresge S, Yadrick K, Zoellner J, Cornell CL. Examining the Diet of Post-Migrant Hispanic Males Using the Precede-Proceed Model: Predisposing, Reinforcing and Enabling Dietary Factors. *Journal of Nutrition Education and Behavior*. 2013; 45(2): 109-118.

Community Board 11 Statement of District Needs, Fiscal Year 2016. Draft.

Dunn RL, Kalich KA, Henning MJ, Fedrizzi R. Engaging field-based professionals in a qualitative assessment of barriers and positive contributors to breastfeeding using the social ecological model. *Maternal and Child Health*. 2015; 19(1): 6-16.

Earp JA, Ennett ST. Conceptual models for health education research and practice. Health Education Research. 1991; 6: 163-17

Echeverria SE, Luan Kang A, Isasi CR, Johnson-Dias J, Pacquiao D. A community survey on neighborhood violence, park use, and physical activity among urban youth. *J Phys Act Health.* 2014 Jan;11(1):186-94.

Emerson RM, Fretz RI & Shaw LL, Writing Ethnographic Fieldnotes. Chicago: University of Chicago Press, 1995: Ch. 1 Fieldnotes in Ethnographic Research (pgs 1-16).

Eng E, Strazza K, Rhodes SC, Griffith D, Shirah K, Mebane E. Insiders and outsiders assess who is “the community”: Participant observation, key informant interview, focus

group interview, and community forum, Ch 5. In: **Israel** BA, Eng E, Schulz AJ, Parker EA, eds. *Methods for Community-Based Participatory Research for Health,* 2nd ed. San Francisco, CA: Jossey-Bass; 2013: 133-159.

Faridi Z, Grunbaum JA, Gray BS, Franks A, Simoes E. Community-based participatory research: necessary next steps. *Prev Chronic Dis* [serial online] 2007 Jul.

Finifter, D.H., Jensen, C.J., Wilson, C.E., & Koenig, B.L. (2005). A comprehensive, multitiered, targeted needs assessment model. *Family & Community Health, 28*(4), 293-306.

Finlay L. "Outing" the Researcher: The Provenance, Process, and Practice of Reflexivity. *Qualitative Health Research.* 2002;12(4):531-545.

Gandelman, A, DeSantis, LM, Rietmeijer, CA. Assessing Community Needs and Agency Capacity- An Integral Part of Implementing Effective Evidence-Based Interventions. *AIDS Education and Prevention*. 2006; 18A, 32-43.

Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qualitative Health Research*. 2005. 15(9): 1277-88.

Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: Assessing partnership approaches to improve public health. *Annu. Rev. Public Health*. 1998: 173-202.

Jewkes R, Murcott A. Meanings of community. *Soc Sci Med.* 1996; 43, 4: 555-563

Jewkes R, Murcott A. Community representatives: Representing the “Community”. *Soc. Sci. Med. 46(7): 843-858, 1998*

Kellog Foundation. *Logic Model Development Guide*. Battle Creek, MI: W.K. Kellogg Foundation; 2004

Kerstetter, K (2012). Insider, outsider, or somewhere in between: The impact of researchers’ identities on the community-based research process. *Journal of Rural Social Sciences*, 27(2), 99-117.

Kretzman JP and McKnight, JL, (1993). Building Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community's Assets, Evanston, IL: Institute for Policy Research pp. 1-11.

McAlister A, Puska P, Salonen J, Tuomilehto J, Koskela K. Theory and Action for Health Promotion: Illustrations from the North Karelia Project. *American Journal of Public Health.* 1982;71(1): 43-50.

Minkler, M. (2004) Ethical Challenges for the "Outside" Researcher in Community-Based Participatory Research. *Health Education & Behavior*. 31 (6): 684-697.

Minkler M, Wallerstein N, Introduction to community-based participatory research: New issues and emphases. In: Minkler M, Wallerstein N, eds. *Community-based participatory research for health: From process to outcomes*. 2nd ed. San Francisco, CA: Jossey-Bass; 2008: 5-23.

Morgan, PJ et al. The SHED-IT community trial study protocol: a randomised controlled trial of weight loss programs for overweight and obese men. *BMC Public Health*. 2010; 10: 701.

Ritchie J, Lewis J. *Qualitative Research Practice: A Guide for Social Science Students and Researchers. Chapter 7: In-depth interviews.* London; Thousand Oaks, CA: Sage; 2003.

Romero D, Kwan A, Swearingen J, Nestler S, Cohen N. (2012) Impact of the closure of a large urban medical center: a qualitative assessment (part I). *J Community Health.* Oct;37(5):982-94.

Romero D, Kwan A, Nestler S, Cohen N. (2012) Impact of the closure of a large urban medical center: a quantitative assessment (part II). *J Community Health.* Oct;37(5):995-1005.

San Francisco Community Health Assessment + Profile, San Francisco Department of Public Health, 2012.

Schensul JJ, Berg MJ, Nair S, Using ethnography in participatory community assessment, Ch 6. In: **Israel** BA, Eng E, Schulz AJ, Parker EA, eds. *Methods for Community-Based Participatory Research for Health,* 2nd ed. San Francisco, CA: Jossey-Bass; 2013: 162-188.

Sharma RK. *Putting the community back in community health assessment*: A process and outcome approach with a review of some major issues for public health professionals. *Journal of Health and Social Policy* 2003; 16, 3: 19-33

Sharpe PA, Greaney ML, Lee PR, Royce SW. (2000) Assets-oriented community assessment. Public Health Rep.Mar-Jun;115(2-3):205-11.

UCLA Center for Health Policy Research. Section 4: Key Informant Interviews.

Ulin P, Robinson ET, Tolley EE. Qualitative Methods in Public Health: A Field Guide for Applied Research. Jossey-Bass (2007).

Van der Wees PJ et al. Comparing the implementation of team approaches for improving diabetes care in community health centers. BMC Health Serv Res. 2014 Dec 3;14:608.

Other Resources:

Helpful Websites—Assessment and Planning

Community Toolbox, Bringing Solutions to Light http://ctb.ku.edu/en/. A helpful collection of resources for community health assessment and health program planning.

National Association of County & City Health Officers, Community Environmental Health Assessment (PACE EH)
http://www.naccho.org/topics/environmental/landuseplanning/index.cfm
A model for conducting community environmental health assessment at the local level.

National Association of County & City Health Officers, http://www.naccho.org/toolbox/. A collection of tools and resources for local public health practice.

National Association of County & City Health Officers
http://www.naccho.org/topics/infrastructure/MAPP/index.cfm. A community driven model for health planning in local public health.

The Asset Based Community Development Institute. http://www.abcdinstitute.org/. Resources and tools for asset based community planning.

Community and Public Health Data

U.S. Census Bureau. http://www.census.gov/ National, state and local data on populations, housing and economic indicators.

Centers for Disease Control, Behavioral Risk Factor Surveillance System.
http://www.cdc.gov/brfss/ national and state level data on behavioral risk factors.

New York City Health Department, Data and Statistics.
http://www.nyc.gov/html/doh/html/data/data.shtml, Health related data for New York City, including an interactive feature.

New York State Department of Health, Data and Statistics.
http://www.health.state.ny.us/statistics/ Health related data for New York State.

New York State, Community Health Assessment Clearinghouse.
http://www.health.state.ny.us/statistics/chac/ Resources for community health assessment in New York State.

Community Asset and Assessment Mapping

Asset-Based Community Development Institute
http://www.abcdinstitute.org/

Mapping Community Capacity by John McKnight & John Kretzmann
www.racialequitytools.org/resourcefiles/mcknight.pdf

Vitalizing Community: Building on Assets and Mobilizing for Collective Action by John Allen, Sam Cordes, Jeff Hart
Step-by-step guide to preparing for and hosting an asset mapping effort
www.nlc.state.ne.us/epubs/U2031/H003-2004.pdf

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS
Community Organizing and Development for Health
COMHE 75200
3 Credits
Spring 2016

Time and location	Silberman Campus, Room 215, Mondays 6:05 – 7:50 PM
Instructor	Lynn Roberts, PhD e-mail: lroberts@hunter.cuny.edu (best way to contact) Office: Room 530, Silberman Phone: 212-396-7742 (do not leave message)
Office hours	Mondays 4-6 PM and by apt
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Prepares students to work in communities by presenting the theory and practice of organizing for social justice, skills for promoting leadership development within communities, and the tools to create and sustain healthy organizations.
Course prerequisites	PH 75500, COMHE 75000, COMHE 75100
Course format	Seminar with field based learning experiences
Required reading and resources	Minkler M. (Ed) *Community Organizing & Community Building for Health and Welfare (3rd Edition)*. New Brunswick, NJ: Rutgers University Press; 2012. [ISBN: 978-0-8135-5300-9] The following materials are on reserve in the Silberman Library: **Bhargava** D. Progressive organizing on welfare policy. In The Applied Research Center. *From Poverty To Punishment: How Welfare Reform Punishes the Poor*. ARC; 2002; 199-208. **Delgado G**. *Beyond the Politics of Place: New Directions in Community Organizing*. Berkeley, CA: Chardon Press; 1997: 29-64. **Incite!** Women of Color Against Violence. *The Revolution Will Not Be Funded: Beyond the Non-Profit Industrial Complex*. Cambridge: South End Press; 2007.

van Gelder S. *This Changes Everything. Occupy Wall Street and the 99% Movement.* San Francisco: Berrett-Koehler Publishers, Inc.; 2011.

All additional course readings (listed below alphabetically by author) will be made available in BB. Still further readings at least two weeks in advance of the class for which readings are assigned may be made available during the semester.

Airhihenbuwa CO. Health promotion and the discourse on culture: implications for empowerment. *Health Education Quarterly*, 1994; 21, 3: 345-353.

Alinsky S. Of means and ends. In *Rules for Radicals*. NY: Vintage Press; 1991: 198-207.

Anner J. Having the tools at hand: Building successful multicultural social justice organizations. In *Beyond Identity Politics: Emerging Social Justice Movements in Communities of Color*. Boston: South End Press; 1996: 153-166.

Barrett D **Leddy** S. Assessing creative media's social impact. *The Fledgling Fund*. 2008. Available at: http://edlab.tc.columbia.edu/files/ImpactPaper.pdf

Beauchamp DE. Public health as social justice. Blue Cross Blue Shield Association *Inquiry*: 13; 1976: 1-14.

Biklen DP. Legal advocacy. In *Commmunity Organizing Theory and Practice*. Englewood Cliffs, NJ: Prentice-Hall; 1983: 127-152.

Echo Justice Communications Collaborative. *Echoing Justice. Communications Strategies for Community Organizing in the 21st Century*. October 9, 2014. Available for download at: http://centerformediajustice.org/resources/echoing-justice-report/

Feinberg M. Victory in the South Bronx: What it took to win. *Everyone's Backyard*. Fall Issue 1997; 9-11.

Groarke M. Using community power against targets beyond the neighborhood. *New Political Science*. 2004; 26,2: 171-188.

Guinier L. The task ahead: Breathing new life into democracy. In *Lift Every Voice: Turning a Civil Rights Setback Into a Vision of Social Justice*.

New York: Simon and Schuster; 1998: 251-272.
Heiser PF**, Begay** ME. The campaign to raise the tobacco tax in Massachusetts. *American Journal of Public Health*, 87, 6; 1997: 968-973.

Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: Assessing partnership approaches to improve public health. *Annu. Rev. Public Health*. 1998: 173-202.

Lewis L, McNeil L. Don't talk about us; talk with us: Picture the Homeless. McNeil L (Ed) *Street Practice: Changing the Lens on Poverty and Public Assistance.* Burlington VT: Ashgate; 2012: 117-145.

Kahn S. *How People Get Power*. (Revised ed.) Washington, DC: NASW Press; 1994: 62-109.

Milkman R, Luce S, Lewis P. Changing the Subject: A Bottom Up Account of Occupy Wall Street in New York City. New York: Murphy Institute of the City University of New York; 2013.

Petchesky RP. Owning and dis-owning the body: A reflection. *The Oxford Handbook of Transnational Feminist Movements: Knowledge, Power and Social Change* (Forthcoming) Edited by Rawwida Baksh and Wendy Harcourt. Online Publication Date: Aug 2014 DOI: 10.1093/oxfordhb/9780199943494.013.019

Pharr S. *In the Time of the Right: Reflections on Liberation*. Berkeley, CA: Chardon Press. 1996. Out of print, but available at: http://suzannepharr.org/wp/wpcontent/uploads/2008/01/inthetimeoftherightcondensed.pdf.

Picture the Homeless[1]. *Homeless People Count Vacant Properties in New York*. Bronx, New York: Picture the Homeless; 2007. http://www.picturethehomeless.org/PTH_Homeless_People_Count_Report.pdf

Picture the Homeless[2]. *Time's Up: Homeless New Yorkers Demand Alternatives to Bloomberg's Failed Five-Year Plan*. Bronx, NY: Picture the Homeless; 2009. http://www.picturethehomeless.org/PTH_Times_Up_Report.pdf

Pursley S. Gay politics in the heartland: with the lesbian avengers in Idaho. *The Nation.* 1995, January 23 (reprinted).

Reagon B. Coalition politics: Turning the century. In *Home Girls: Black Feminist Anthology*. Barbara Smith, ed. New York: Kitchen Table - Women of Color Press; 1981: 356-368.

Rothman J. Three models of community organization practice. In *Social Work Practice 1968*. New York: Columbia University Press; 1968.

Sen[1] R. Introduction: Community organizing – yesterday and today. In *Stir It Up: Lessons in Community Organizing and Advocacy*. San Francisco: John Wiley & Sons; 2003: xlll-lxv.

Sen[2] R. New realities, integrated strategies. In *Stir it Up: Lessons in Community Organizing and Advocacy*. San Francisco: John Wiley & Sons; 2003: 1-47.

Shaw[1] R. Direct action: acting up and sitting in. In *The Activist's Handbook*: *A Primer for the 1990's and Beyond*. Berkeley: University of California Press; 1996: 212-250.

Shaw[2] R. Coalition activism: Rounding up the usual suspects. In *The Activist's Handbook: A Primer for the 1990's and Beyond.* Berkeley: University of California Press; 1996: 81-114.

Silliman[1] J, Fried M, Ross L, Gutiérrez E. Women of color and their struggle for reproductive justice & the political context for women of color organizing. In *Undivided Rights: Women of Color Organizing for Reproductive Justice*. Cambridge: South End Press; 2004: 1-47.

Silliman[2] J, Fried M, Ross L, Gutiérrez E. The mother's milk project. In *Undivided Rights: Women of Color Organizing for Reproductive Justice*. Cambridge: South End Press; 2004: 1213-141.

Toney M. Power concedes nothing without a demand: Building multiracial organizations with direct action. In *Beyond Identity Politics: Emerging Social Justice Movements in Communities of Color*. John Anner, Ed. Boston: South End Press; 1996: 17-28.

Wallerstein N, **Freudenberg** N. Linking health promotion and social justice: a rationale and two case stories. *Health Education Research*, 13, 3:451-457.

Wallerstein N. Powerlessness, empowerment, and health: Implications for health promotion. *Behavior Change,* 6; 1992: 197-205.
We Interrupt this Message and Youth Force. *In Between the Lines: How the New York Times Frames Youth*.
http://www.interrupt.org/pdfs/witmtimesstudy.pdf accessed on 4/18/02.

Young I. Five faces of oppression. In *Justice and the Politics of Difference*. Princeton, NJ: Princeton University Press. 1990; 39-65.

	Zald MN, Ash R. Social movement organizations: growth, decay and change. *Social Forces*, 44,3; 1966; 327-341.
Suggested reading and resources	**Holsaert** FS, Noonan MPN, Richardson, J, Robinson, BG, Young, JS, and Zellner, DM (Eds.) *Hands on the Freedom Plow: Personal Accounts by Women in SNCC*. Champagne, IL: University of Illinois Press; 2010. [ISBN: 978-0-252-07888-0] **Sen** R. *Stir It Up: Lessons in Community Organizing and Advocacy.* San Francisco: Jossey-Bass; 2003. [ISBN 07879653332] The following videos can be viewed in the Helene Fuld Media Center located on the mezzanine level of the West Building at the Brookdale campus –OR- borrowed from Professor Roberts. Should you decide to write a brief (no more than three pages) critical analysis of any of these films, you will receive extra credit (up to maximum of 5 points for each paper; no more than 2 papers to be submitted). Do not merely summarize the films, but rather, present your original thoughts and reactions in relation to course readings and discussions. Other films may be identified. 1. *Another Brother* Tami Gold and Elena Schwoltsky-Fitch. Call number: # 6062. 2. *Corner Prophets* Youth Force. Call number: # R93. 3. *GMHC: Community Organizing with Larry Kramer and Roger McFarlane*. 1996. (60 minutes) Call number: #5745. 4. *Women, Organizing, Diversity: Struggling with the Issues*. 1996. (120 minutes) Call number: #5852. You are also encouraged to visit the inaugural exhibit *Activist New York* at the Museum of the City of New York. ***Activist New York*** explores the drama of social activism in New York City from the 17th century right up to the present. In a town renowned for its in-your-face persona, citizens of the city have banded together on issues as diverse as historic preservation, civil rights, wages, sexual orientation, and religious freedom. Using artifacts, photographs, audio and visual presentations, as well as interactive components that seek to tell the entire story of activism in the five boroughs, ***Activist New York*** presents the passions and conflicts that underlie the city's history of agitation. For more information visit: http://www.mcny.org/exhibition/activist-new-york

	Finally, throughout the semester, reference will be made in class discussions and readings to seminal texts that are relevant to social justice and community organizing. For your convenience, here is a link to a compilation of several of these works: http://flanneryogonner.tumblr.com/post/40237682151/free-pdf-books-on-race-gender-sexuality-class

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Community and Social Sciences (Program Core)		
1. Apply social and behavioral theory and evidence to assess, plan, implement and evaluate community health programs, policies and interventions that promote health equality and reduce inequities.	• Analyze the impact of individual, organizational, community, national, and global trends and interdependencies on public health related problems and systems • Assess organizing tactics and strategies that are most effective in mobilizing communities around selected health-related issues. • Discuss the importance of community organizing in improving the health status of diverse populations	• Facilitated Class Discussions • Issue Analysis Paper • Activities Paper • Strategy Paper • Final Exam
2. Demonstrate team building, negotiation, and conflict management skills in community health interventions.	• Participate in a collaborative process for prioritizing individual, organizational, and community concerns, and for bringing resources to bear on public health problems. • Critically compare and contrast disparate community organizing activities.	• Activities Paper • Strategy Paper • Oral Presentation
3. Engage communities to propose solutions to health inequities that recognize the role of power and stratification systems.	• Conduct interview and actively engage with community organizer(s) to improve the health status of diverse	• Activities Paper • Interview Paper • Strategy Paper

	populations. • Work within small groups to critically assess which organizing strategies and tactics are most effective in mobilizing communities around selected health-related issues. • Prepare and present an evidence-based campaign for community mobilization to address the root causes of a selected health-related issue.	• Oral Presentation

Course Assessments

Your understanding of the course material will be evaluated through the following:

1. Each student will be expected to **lead the class in a discussion of the readings once during the semester**. Assignments to lead discussion will be made during the first two weeks of class. Guidelines for preparing for class discussions will be developed in consultation with the instructor.

2. Enrollment in **BlackBoard** to facilitate communication with instructor and classmates and identify resources for completing class assignments.

3. Completion and presentation of a Semester Project based on several component parts:

    a. **Choose a health issue you feel passionate about** and that can be addressed through community organizing. Bring a one paragraph description of the health issue including an example of current strategies being used to address it to class on **2/22** for topic approval (this may be legibly hand written). It is suggested, but not required, that you also have identified and mention an organization or group that you will work with for the remainder of the project to fulfill course requirements. **Health Issue Topic due 2/22.**

    b. Once topic is approved, **prepare a written analysis of the issue** (maximum 4 pages), including a description of its antecedents (i.e., its root causes), the community organizing strategies currently being used to address the problem (if any), as well as an overview of some of the other health education methods employed to address the health issue, if applicable. Include a reference list of at least 5 references (properly cited), of which at least two must be professional peer-reviewed journals. It is also required that you include additional sources of information (e.g., alternative and progressive printed and broadcast media, CBO reports, issue papers, etc.). **Issue Analysis Paper due 3/14.**

    c. If not already done, identify one or more groups, organizations or agencies that are actively involved in community organizing around your chosen health issue. **Become *actively* involved in at least 2 organizing activities** of one or more of these groups. For example, you may participate in:
        - a meeting to plan, organize, strategize, build coalitions, etc. to effect change concerning this health issue.
        - a march, rally, protest, vigil, public hearing or other organized activity designed to engage or confront the public/elected officials to effect change concerning your selected health issue.

Please note that these are *just examples* and are not meant to limit the types of activity in which you become engaged. You must become an active participant in these two functions, not remain an observer or sidelines participant. (If your selected group will not be sponsoring one or more of these activities while you are working on this project, you may select similar activities from another group or health issue. Please discuss with me, first, if this is the case). **To assist you in identifying CO organizations or activities, periodic announcements, e-mail notices, and Web Links via BlackBoard will be made available to you.** For both activities, write one short report (no more than 5 pages) describing, comparing and contrasting your two experiences. Analyze what you have observed in light of class discussions and readings. Especially important to note is how closely these activities meet (or not!) the criteria for community building or community organizing as discussed in class and readings. **Community Organizing Activities Report due 4/4. Extensions (if requested in advance of the due date) are permitted if activities are scheduled beyond this date.**

d. **Conduct an interview with a community organizer** who is working on the health issue you have selected. If unable to find an organizer working on your issue, you can interview someone else, as long as you consider him/her/them to be an organizer. We will discuss and develop guidelines for the interview in the class. If you have any questions about the appropriateness of the organizer you have selected, please see me. Write a paper (no more than 5 pages) describing and analyzing your interview with the organizer, incorporating what you have learned from class readings and discussions. Include in your paper a description of the origin, structure, problems and successes of the group(s) the organizer has worked with as applicable. **Interview Paper due 4/18. Extensions (requested in advance) are granted if interviewee is not available prior to this date.**

e. **Working with group members in (and outside) of class, select and describe one or more community organizing strategies** (that you learned about from class readings, discussions, participation in organizing activities, and/or your interview) that you think would be best used to address the health issue(s) that is/are important to you and your group. Write an individual brief paper (no more than 4 pages) describing the organizing strategy(ies) selected, your rationale, and how you (in consultation with fellow class members) would implement the overall strategy. **Strategy Paper due no later than 5/23.**

f. Make an oral presentation and lead class in discussion of your findings on either 5/16 or 5/23. Presentations will be grouped with other members of the class who worked on the same or related issues.

Approximate presentation/discussion length will be 10-15 minutes per student depending on class size.

4. A **take-home FINAL EXAM** will be distributed in class on **5/9** and will be due on **5/16 at the beginning of class**. **No extensions will be accepted for the Final Exam.**

Grading

Evaluation criteria

All papers will be assessed as follows: Content (5%); Style (5%); and Analysis (5%).

The relative weight of each course component is as follows:

Assessment	Weight
Attendance/Participation/Facilitation	10%
Issue Analysis Paper	15%
Activities Paper	15%
Interview Paper	15%
Final Exam	20%
Strategy Paper	15%
Oral Presentation	10%
TOTAL:	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw

from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

General guidance for submission of all assignments

It is expected that all writing will be of high quality, presented in a readable and consistent manner: **typewritten, double-spaced, 12 inch font, with one-inch margins all around, stapled in upper left-hand corner, with all pages enumerated and proofread.** All papers and exams should be kept to the maximum length specified. The instructor will stop reading after the maximum length and the assignment will be marked down, accordingly. A simple cover sheet with student name, title of assignment, course info, term, and date is adequate for identification purposes. Please do not submit papers in folders or binders.

Any deliberate borrowing of the ideas, terms, statements, or knowledge of others without clear and specific acknowledgment of the source is intellectual theft and is called plagiarism. It is not plagiarism to borrow the ideas, terms, statements, or knowledge of others if the source is clearly and specifically acknowledged, and quoted if appropriate. Students who consult such critical material and wish to include some of the insights, terms, or statements encountered must provide full citations in an appropriate form. All citations should follow the *Am J Public Health* style, which follows the guidelines of the American Medical Association (AMA). A style guide is provided in the Assignments section of BlackBoard.

Attendance and class participation

Timely arrival, regular attendance and *informed* participation in class discussions and exercises based on a critical reading of the assigned articles and text is required. Students must sign up for Blackboard to receive updates, in-class materials, lectures, readings and assignments, as well as to submit assignments. For instructions on registering for Blackboard through Hunter, go to: http://bb.hunter.cuny.edu. Students should check their Blackboard□related email for class announcements and assignments.

Late/incomplete submission of assignments

Papers and other assignments are due at the beginning of the class period or by the deadline specified for submitting electronically. One point will be deducted for each day an assignment is late. If a student anticipates the need to turn in work late, they must send a request via e-mail and negotiate a mutually acceptable submission plan in advance of the established due date (this applies to the Activities and Interview Papers as specified above). Students should not send an e-mail requesting an extension on the day the assignment is due**.** Students should not miss class nor be tardy on the day an assignment is due in order to complete the assignment. No extensions will be granted for the Final Exam.

Make-ups, rewrites, and extra credit

Re-writes will not be accepted for any assignments. Students can receive up to 5 extra points toward their final grade by viewing any of the films provided in the syllabus and writing a thoughtful analysis (not just a summary). Students who already have a 97+ cumulative grade in the course are not eligible for Extra Credit. Deadline for E.C. submissions (hard copies only) is the last day of class on May 23.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Learn how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. Reduced credit for work completed after the due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.

- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact professor directly with personal questions and concerns related to the course.
- **On the last day of class, we will hold a dish-2-pass/pot luck to celebrate the end of the semester.** Students are expected to contribute a dish, beverage or paper goods of choice.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website.
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Preferred method of communication is email and will respond to student email within 24 hours Monday through Thursday and within 48 hours Friday- Saturday or during holiday breaks.
- Grading and feedback on assignments within 1-2 weeks of the due date.
- Communication about grades and progress in the course will be given through the course website.
- **On the last day of class, we will hold a dish-2-pass/pot luck to celebrate the end of the semester.** Students can expect the instructor to contribute a carrot cake.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Please Note: This schedule & assignments subject to change. Additional readings and handouts may be provided. Check BlackBoard for updates.

Session	Date	Topic	Readings and Assignments
1.	Feb 1	Introductions/Overview of Course	Beauchamp, Minkler, Ch 1
2.	Feb 8	Dialogues and Discourses on Power	Petchesky, Young
No Class Feb 15 – President's Day			
3.	Feb 22	History, theories and models of community organizing and mobilization	Minkler: Chs. 3, 4 (pp. 59-64), 5; Rothman; Sen (1) **Assignment 1: Health Issue due**
4.	Feb 29	Utilizing media, technology & the arts/ Youth as Organizers	Barrett & Leddy; Echoing Justice Report; Minkler: Chs. 15, 16, 22; We Interrupt this Message/Youth Force
5.	Mar 7	Critical pedagogy and community strategies for empowerment	Airhihenbuwa; Minkler: Ch. 4 (64-77) & 14; Wallerstein
6.	Mar 14	Direct action strategies for community mobilization	Pursley; Shaw (1) **Assignment 2: Issue Analysis due**
7.	Mar 21	Legal, legislative and political action	Biklen; Guinier; Heiser&Begay; Kahn; Minkler: Chs. 20, 21
8.	Mar 28	Coalition & movement building strategies	Feinberg; Groarke; Minkler: Chs. 8, 17, 18; Reagon; Silliman (1); Shaw (2)
9.	Apr 4	Community-based participatory research for community mobilizing and social change	Israel; Minkler: Chs. 9, 19 **Assignment 3: Activities Report due**

10.	Apr 11	Role of health educators in community and social justice organizing; Ethical considerations	Alinsky; Minkler: Chs. 6, 7; Wallerstein & Freudenberg
11.	Apr 18	Organizing across differences; Facing "race" and sustaining multi-cultural organizations	Anner; Delgado*; Minkler: Chs. 12, 13; Silliman (2); Toney **Assignment 4: Interview Report due**
No Class on April 25 ~ Spring Break April 22 – 30			
12.	May 2	Organizing at the grass roots; Leadership development in marginalized communities	Bhargava/ARC*****; Lewis & McNeil; Minkler: Chs. 10, 11 Optional readings: Picture the Homeless (1&2)
13.	May 9	Organizational development & maintenance; Organizing post-9/11, in the age of Obama, Occupy Wall St, and #BlackLivesMatter	Minkler, Ch. 2; Milkman et al; Pharr; Sen (2); van Gelder*; Zald & Ash; Incite! * Time will be allotted for "in class" consultation with class members working on similar issues **Final Exam distributed**
14.	May 16	**Oral Presentations**	**Final Exam due**
15.	May 23	**Oral Presentations** Dish-2-Pass	**Assignment 5: Strategy Paper due**

COMMUNITY HEALTH EDUCATION SPECIALIZATION

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

COMHE 753.02 -- Health Program Planning and Funding
3 Credits
Spring 2016

Time and Location	Thursday, 6:05pm – 7:50pm Silberman Building, Room 320
Professor	Karyn Faber, EdD, MPH
Email	kf206@hunter.cuny.edu
Office hours	By Appointment
Course Description	This course will engage students in identifying or designing a health program, finding funding sources, and developing a proposal covering program need, program objectives, a management and quality assurance plan, preliminary work, evaluation, budget, and a plan for funding support.
Course Prerequisites	Completion of 15 credits including PH75000 (Fundamentals of Biostatistics) or PH75100 (Principles of Biostatistics); and either COMHE 75000 (Community Health Assessment), COMHE 75100 (Community Health Interventions), and COMHE 75200 (Community Organizing for Health); OR COMHE 75000 and NUTR 71000 (Principles of Public Health Nutrition); OR NURS 77100 (Community/Public Health Nursing), COMHE 75100 and COMHE 75200.
Course Format	This course is taught with a mix of online learning resources and in-class discussion.
Required text	• Geever, Jane C. The Foundation Center's Guide to Proposal Writing, 6th Edition, 2012. • All additional class readings are available on Blackboard.
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Suggested reading	See Page 7 of this document

ACADEMIC PROGRAM COMPETENCIES

Program Competencies *This course will help you to:*	**Course Learning Objectives** *After successfully completing this course, you are expected to be able to:*	**Assessment Methods** *Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply social and behavioral theory and evidence to assess, plan, implement and evaluate community health programs, policies and interventions that promote health equality and reduce inequities.	• Critically evaluate the assumptions in a logic model (particularly about race, gender, poverty, culture, and local community dynamics). • Distinguish between community based and community placed public health programs and initiatives. • Develop a theory of change and logic model for a multi-component and multi-level community-based health program. • Write program objectives that are clear, specific, measurable and logical, given an overall health promotion strategy. • Write an implementation plan including specification of required resource, a service utilization and organizational plan.	• Statement of Need • Foundation Center Workshop • Mock proposal evaluation • Class participation via online quizzes and in-person.
Demonstrate team building, negotiation, and conflict management skills in community health interventions.	• Work within small groups to develop the program proposal and presentation. • Identify strategies for developing collaborative initiatives and engaging various stakeholders and community members in the design of a community based intervention program.	• Class attendance and participation • Group member evaluations • Proposal draft
Use qualitative and quantitative research methods to generate insight into community health issues.	• Develop a full grant application for public health programs and research and identify appropriate funding mechanisms.	• Final draft of grant proposal • Group oral presentation

COURSE ASSESSMENTS

Overview: All assignments should be double-spaced, in an acceptable 12-point type font, with 1.0 inch margins on all sides and page numbers on the bottom right of each page, with student names on the top of the first page (or title page of the proposal). All assignments should be submitted via Blackboard by 6:05pm on the due date. **Any assignment sent at or after 6:06pm will be considered late**. The course will be aimed toward producing the main assignment, an 11-13 page proposal with a budget spreadsheet and 1-2 page accompanying budget justification. Please follow the AMA format for citing references. Papers and reports should be kept to the maximum length specified. I will stop reading after the maximum length and you will be marked down, accordingly. It is expected that your writing will be of graduate-level quality, presented in a readable and consistent manner as specified in the format requirements for assignments.

A. **Foundation Center Workshop.** Students are required to attend one workshop of their choice at the Foundation Center. Please sign up for workshops online in advance, as they fill up. We will start each class with students giving a brief & informal overview of the workshop they attended. These workshops are usually 1 hour in length & free of charge: http://www.grantspace.org/Classroom/training-calendar/New-York. **A brief write-up of the workshop is due by 4.14.2016**

B. **Statement of Need:** Individually, write a 2-3 page brief literature review which makes the case for a data-driven, theoretically-driven program of public health significance, addressing an important and current UNMET need. This review should contain at least 8-10 references of journal articles related to a health promotion or research on a community health

issue. This review should serve as a research source for the needs development and proposed program in your group proposal.

C. **Proposal Draft Part I.** In your assigned groups, students should research and select a national or local community-based organization for which to develop and write the proposal. Each group will submit one draft proposal that includes the following proposal sections: statement of need (1-2 pgs.), project goals/objectives (1-2 pgs.) and methods (1 pg.). In addition, create a table of prospective funders along with a 1-2 pg. description of your funding search (include databases & search terms used). This table should include approximately 5-10 funders and the following column headings and corresponding information for each potential funder:

- Name of funder, Subject area they are interested in funding, Geographic Focus, and Notes. In the Notes column give justification for keeping or removing this funder on your refined list of final potential funders.

D. **Mock Proposal Evaluation.** Assuming the role of a reviewer/funder, students will complete an evaluation of a grant proposal using a rubric template that will be provided on Blackboard. The proposal will be provided two weeks prior to the assignment due date.

E. **Final Group Proposal.** The final proposal should incorporate edits from the first draft and should include the following sections:

a. Cover letter (1 pg.)
b. Title page & table of contents (1 pg.)
    i. Please note on the title page if you are planning to actually use this proposal. Note that the program needs to be created independently (in your groups), without replicating an existing program at your organization in its current form.
c. Executive summary (1 pg.)
d. Narrative
    i. Statement of need (2 pgs.)
    ii. Project description (4-5 pgs.)
        1. Goals/objectives
        2. Methods
        3. Evaluation
        4. Sustainability
    iii. Organization information (1-2 pgs.)
    iv. Conclusion (2 paragraphs)
e. Budget spreadsheet (1 pg.)
f. Budget justification (1-2 pgs.)
g. Appendices & supporting materials (optional)

F. **Oral Presentation.** Each group will present as a whole on their program proposal, but students will be graded individually. Each student will have 5 minutes to present (total of 20 minutes per group). Five percent (5%) of the grade will be derived from average of group peer evaluations (peer evaluation form posted on Blackboard & due by May 19th) and 10% will be derived from the instructor's grade.

Suggested Journals and Sites for Health Promotion/ Intervention Program Resources:

1. http://www.health.state.ny.us/statistics/
2. http://www.nyc.gov/html/doh/html/community/community.shtml
3. http://www.cdc.gov/brfss/
4. http://www.hhs.gov/ophs/oah/prevention/index.html
5. DEBI, Diffusion of Effective Behavioral Interventions, CDC http://www.effectiveinterventions.org
6. Health Education and Behavior (formerly Health Education Quarterly)
7. AIDS Education and Prevention
8. Health Promotion Practice
9. American Journal of Public Health
10. Health Promotion International
11. Journal of Urban Health: Bulletin of the New York Academy of Medicine
12. Journal of Health Care for the Poor and Underserved

GRADING

Evaluation Criteria:
All work is expected to be presented on time. Five points (out of 100) will be deducted for each day a written assignment is late. In case of extenuating circumstances, please contact me. Please do NOT ask for an extension the day before an assignment is due. The relative weight of each course component is as follows:

Assignment	Type	% grade	Due Date
Class Attendance	Individual	5	Throughout semester
Class Participation	Individual	10	Throughout semester
Statement of Need	Individual	10	3.10.2016
Foundation Center Workshop (attendance, brief presentation & write-up)	Individual	5	4.14.2016
Proposal Draft – Part I	Group	15	4.21.2016
Mock proposal evaluation	Individual	15	5.05.2016
Group member evaluation	Individual	5	5.19.2016
Oral presentation of proposal	Individual	15	5.19.2016
Final written proposal	Group	20	5.20.2016

The grading system for the course follows guidance in the Hunter Catalog:

Letter Grade	Quality Points	Percentage
A+	4.0	97.5%- 100%
A	4.0	92.5 – 97.4%
A-	3.7	90.0 – 92.4%
B+	3.3	87.5 – 89.9%
B	3.0	82.5 – 87.4%
B-	2.7	80.0 – 82.4%
C+	2.3	77.5 – 79.9%
C	2.0	70.0 – 77.4%
F	0	0.00 – 69.9%

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

COMHE 753 (Section 2) – Health Program Planning and Funding
January 25, 2016 Spring 2016

COURSE POLICIES

Format:
The course uses a "learn-by-doing" and "learn-by-exposure-to-success" approach to program planning and funding, and will be run as an interactive seminar. Some lectures will be held online, which means although there will not be an in-class session, students are required to access all recorded lectures or other activities posted to Blackboard.

Attendance, Lateness and Absences:
Participation in class discussion and Blackboard (when assigned) is vital in this course. Class will start promptly in order to maximize our time together. If you are going to be late or going to miss a session, please inform the instructor via email *prior* to the class. It is your responsibility to obtain the content and assignments for those sessions you miss (network with your classmates). Excessive lateness and absences will be noted and reflected in your final grade. If you miss more than two classes you risk receiving a failing attendance and participation grade.

Late Submission of Assignments:
All assignments are expected to be completed on time. **DO NOT SEND AN E-MAIL REQUESTING AN EXTENSION ON THE DAY THE ASSIGNMENT IS DUE.** All assignments should be submitted via Blackboard by 6:05pm on the due date. **Any assignment sent at or after 6:06pm will be considered late**. With the exception of cases involving critical extenuating circumstances, late submissions of written assignments will be penalized 5 points each day it is late (*including weekends*). **After 2 days of lateness, you will not receive credit for the assignment(s).**

Make-ups, rewrites, and extra credit:
There are no allowances for make-ups, rewrites, or extra-credit assignments.

Citizenship & Rules of Conduct**:**
The classroom is a community. Respectful interaction with the instructor, classmates, and guests is expected at all times. Public health deals with controversial issues from multiple perspectives and consideration of these issues may cause disagreements among us or may evoke strong personal feelings, depending on our individual experiences, histories, identities and worldviews. Therefore, in all of interactions and communications, it is important that students strive to demonstrate mutual respect for one another and for any course guests and members of the community with whom they come into contact.

Please avoid crosstalk, text messaging, and turn off (or set to vibrate) cell phones, tablets, or anything that can be distracting and take away from a climate of mutual learning or attentive listening and participation. Student announcements of related events and opportunities of interest to students may be made at the end of the class. Students should let the instructor know if they have an announcement to make. Feel free to bring refreshments to class for yourself and/or others; but please help clean up afterwards.

Email correspondence:
Direct any inquiries to the instructor via e-mail. A response can be expected within 48 hours Monday through Thursday, and within 72 hours on a weekend or during holiday breaks.

Accessibility:
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

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COURSE SCHEDULE

The course schedule is subject to change throughout the semester. The "Last Updated" Date in the header of the syllabus references the current version of the syllabus and therefore will be updated if a change in schedule is made.

SES	DATE	TOPIC(s)	READINGS	ASSIGNMENT DUE
1	2.4	Review Syllabus and course requirements. Introduction to program planning and grant writing	**Geever**: Ch. 1, 2	Student questionnaire due on **2.5.2016**
2	2.11	Health Program planning: Goals, Objectives, & Logic models	**Hodges & Videto** (pdf) **Kellogg Logic Model Guide**, Ch 1 & 2 (pdf)	Groups will be formed and organization chosen.
3	2.18	Health Program Planning: Finding Evidence-Based Programs; Program Adaptation	**McKenzie, et al** (Ch 8 pdf)	
4	2.25	Writing Program Grants I (statement of need, project narrative)	**Geever** : Ch 3-5	
5	3.3	Writing Program Grants II (Evaluation, Sustainability, Organizational Capacity)	**Geever** : Ch 6, 8, Appendix A	
6	3.10	Building a Budget	**Geever** : Ch 7, 9, 10	Statement of Need due; Group meetings in class.
7	3.17	Packaging the Proposal	**Geever**: Ch 7, 9, 10	Course meets online.
8	3.24	Finding Funding	**Geever**: Ch 11, 12 ***College follows a Friday Schedule (no in-class meeting).***	Course meets online.
9	3.31	Understanding the Review Process	**Geever**: Ch 14 **McKenzie, et al** (Ch 12 pdf)	Course meets online.
10	4.7	Program Implementation & Program Fidelity; Evaluation	**Readings TBD**	Course meets online.
11	4.14	What Next? Follow-up and Grant Management	**Geever** : Ch 15, 16	Final day for Foundation Center brief presentation – (due any class until 4.14.2014). Group Meetings
12	4.21	Strategies to Maximize Success **Guest Lecturer**: Brenda Henry Sanchez, PhD, MPH	**Geever**: Ch 17 **Myers** et al (pdf) **Sung & Hurlbert** (pdf)	Group proposal draft due.
	4.28	**Spring Recess**		
13	5.5	Writing Research Grants I **NIH and Research Grants**	**Horner** (pdf); **Berg et al** (pdf); **Ogden & Goldberg** (pdf); **Koppelman & Holloway** (pdf) **Review the following NIH websites:** Planning your application: http://grants.nih.gov/grants/planning_application.htm Types of grants: http://grants.nih.gov/grants/funding/funding_program.htm Writing your application: http://grants.nih.gov/grants/writing_application.htm Developing your budget: http://grants.nih.gov/grants/developing_budget.htm Peer review process: http://grants.nih.gov/grants/peer_review_process.htm#Criteria	Mock proposal evaluation due
14	5.12	Writing Research Grants II **Guest Lecturer**: Dionna Walters, MPH, MPA		
15	5.19	Group Presentations.	Group member evaluations due electronically by 6:05pm Final papers due Friday, May 20 by 6:05pm	

Optional readings & additional resources:

- Clarke, Cheryl A. (2009). Storytelling for Grant Seekers: A Guide to Creative Nonprofit Fundraising, 2nd edition. Jossey-Bass.

- Foundation Center's Guide to Proposal Writing: Appendix B & C
  Foundation Center: http://foundationcenter.org/
  The Foundation Center is a premier resource for finding funding, offering training for proposal development and more. They offer free seminars on various topics, open to all.

- Guidestar: http://www.guidestar.org/rxg/about-us/index.aspx
  Guide to Nonprofit fundraising: http://www.guidestar.org/ViewCmsFile.aspx?ContentID=4718

- NIH website grants overview: http://grants.nih.gov/grants/about_grants.htm

- Philanthropy New York:
  http://www.philanthropynewyork.org/s_nyrag/bin.asp?CID=5494&DID=15264&DOC=FILE.PDF

- Rath, T. (2007). Strengths Finder *2.0*. Gallup Press.
  A guide for finding and applying your own personal strengths in your career.

- Sechrest, L & Babcock-Parziale, J. (2007). Writing Effective Research Proposals. Public Interest Research Services.
  This book was written specifically for VA HSR&D Proposal writing, but its content is more broadly applicable to research grant writing.

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

COMHE75300-01 Health Program Planning and Funding
3 Credits
Spring 2016
LAST UPDATED: January 26, 2016

Time and location	Building & room number: N/A; Course fully online Mondays 4:10-5:55pm (meets online synchronously 3 times throughout semester; see schedule below)
Instructor	Meredith G. Manze, MPH, PhD Assistant Professor Email (best way to reach me): Meredith.manze@hunter.cuny.edu Office: Silberman 523 Phone: 212-396-7736
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course will engage students in identifying or designing a health program, finding funding sources, and developing a proposal covering program need, program objectives, a management and quality assurance plan, preliminary work, evaluation, budget, and a plan for funding support.
Course prerequisites	prereq: completion of 15 cr incl PH 75000 or 75100, PH 75500 and either COMHE 75000, COMHE 75100, COMHE 75200 or COMHE 75000 and NUTR 71000 or NURS 77100, COMHE 75100 and COMHE 75200.
Course format	Online; Meets synchronously online for 3 sessions
Required reading and resources	• Geever, Jane C. The Foundation Center's Guide to Proposal Writing, 6th Edition, 2012. • Karsh, Ellen & Fox Arlen S. The Only Grant Writing Book You'll Ever Need. 4th Edition, 2014. All other articles will be provided.
Suggested reading and resources	See bottom of syllabus for suggested readings

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Apply social and behavioral theory and evidence to assess, plan, implement and evaluate community health programs, policies and interventions that promote health equality and reduce inequities.	1. Critically evaluate the assumptions in a logic model (particularly about race, gender, poverty, culture, and local community dynamics) 2. Distinguish between community based and community placed public health programs and initiatives 3. Develop a theory of change and logic model for a multi-component and multi-level community-based health program. 4. Write program objectives that are clear, specific, measurable and logical, given an overall health promotion strategy. 5. Write an implementation plan including specification of required resource, a service utilization and organizational plan	• Proposal Draft I • Final Proposal • Discussion Forum Participation • Mock Proposal Evaluation • Statement of Need
2. Demonstrate team building, negotiation, and conflict management skills in community health interventions.	6. Work within small groups to develop the program proposal and presentation 7. Identify strategies for developing collaborative initiatives and engaging various stakeholders and	• Oral presentation • Group Member Evaluation • Proposal Draft I • Final Proposal • Foundation Center

	community members in the design of a community based intervention program	Workshop • Discussion Forum Participation
3. Use qualitative and quantitative research methods to generate insight into community health issues.	8. Develop a full grant application for public health programs and research and identify appropriate funding mechanisms.	• Final Proposal • Oral Presentation • Oral Presentation Response • Discussion Forum Participation • Mock Proposal Evaluation

Course Assessments

This course will be run as an interactive seminar, using a "learn-by-doing" and "learn-by-exposure-to-success" approach to program planning and funding. Working in groups, students will produce a proposal to fund a program. These proposals will be sharpened as the semester progresses by discussion, coaching by fellow students and by review. Students will have access to model proposals.

Pre-requisites: ability to use/access a computer and email, use a web browser (Internet Explorer, Firefox or Safari) and Microsoft Office applications and use the Blackboard system regularly.

Course format: Class lectures will be posted (PowerPoint with audio recording) by 4:10pm on the Mondays listed in the schedule below (unless otherwise noted). Length of lectures will vary; because all of what would otherwise be in-class activities will be instead be done as part of the Discussion Board Forum, most lectures will run approximately an hour in length (less than the regular class time length).

Your response to the Discussion Board Forum prompts (related to the lecture & readings for that week & the weeks after the last Forum) will be due by the Sunday following that lecture by 4:10pm. (You are of course welcome to post your response any time during that week.) Your responses in these forums will contribute towards your participation grade (see below for more details).

This is NOT a self-paced course; there are deadlines for course assignments throughout the semester. Thus, it is critical that you schedule time to review the lecture & complete the Discussion Board Forums, as well as complete the readings and assignments.

All general questions should be posted in the Discussion Board Forum titled "Questions for the Instructor". Please email me only if you have a question about your personal situation. Otherwise, post general questions in that Forum. Students should check the Forum regularly.

Written Assignments: All assignments should be double-spaced, in Times New Roman 12-point type font, with 1.0 inch margins on all sides and page numbers on the bottom right of each page, with student names on the top of the first page (or title page of the proposal). All assignments should be submitted via BlackBoard (unless otherwise noted) by 4:10pm on the due date. **Any assignment sent at or after 4:11pm will be considered late**.

The course will be aimed toward producing the main assignment, a program proposal. Please follow the AMA format for citing references. Papers and reports should be kept to the maximum length specified. I will stop reading after the maximum length and you will be marked down, accordingly. The page limits listed below for each assignment do not include references. Please keep these at the end of your papers so I am able to

easily assess if you are within the page limits. To be clear, a page length of 2-3 pages means at least two pages but no more than three pages (so it ends somewhere on the second or third page).

All written assignments will be scanned in BlackBoard for plagiarism via SafeAssign. You will be able to review your score. You will have 2 attempts to upload each assignment to BlackBoard (so if you receive a high score for copied text in the first submission, not related to quotes or citations, it is up to you to review and edit and resubmit before the deadline). Allow yourself time for potential revisions before the deadline.

It is expected that your writing will be of graduate-level quality, presented in a readable and consistent manner as specified in the format requirements for assignments. All assignments should be completed independently, unless noted as a group project.

See description of all course assessments below.

Grading

Evaluation criteria

A. Attendance (DUE: throughout semester, 3 points)
Attendance online will be required for 3 synchronous classes (see schedule below). Your attendance grade will be based on your arriving in the chat room on time (class will start promptly at 4:10pm) for all 3 classes (1 point each).

If a class is listed as synchronous that means you will need to attend class online via BlackBoard Collaborate that day from 4:10-5:55pm. More information will be posted about using Collaborate. Also visit:
http://www.cuny.edu/about/administration/offices/CIS/functions/bb/userguides/blackboardcollaborate.html

If you are unable to attend a synchronous class, please email the instructor. If there is a legitimate reason for missing the class, an alternate assignment for attendance will be to watch the recorded session and post three things you learned from it under the Discussion Forum titled “Alternate Assignment”. (Note that this requires instructor approval, so do not assume you can miss class. Email the instructor as soon as you know will need to miss class).

B. Discussion Forum Participation (DUE: throughout semester, 15 points)
You will be asked to participate in 5 Discussion Board Forums. Each of the 5 Forums is worth 3 points, for a total of 15 points. The Forum will have prompts (related to all of the readings and lectures since the previous Forum). Some will require additional reading (of sample proposals, etc.); you should set aside at 1-2 hours for each Forum (in addition to the time needed to listen to the lecture & complete the readings). Your response to each Forum is due on the dates listed below in the schedule (the Sunday

following the lecture, by 4:10pm). For example, the Discussion Board Forum due on Sunday 3/6 will cover the lecture and readings from 2/22 and 2/29. No late responses will be accepted; after 4:10pm on the Sunday it's due, the Discussion Forum will no longer will available.

To obtain a full 3 points you will need to respond substantively, thoroughly and thoughtfully to all prompts, reference the lecture(s) and/or reading(s) and respond to at least two other students' posts. No late submissions will be accepted, except in the case of critical, extenuating circumstances.

The following tips for online communication "netiquette" are taken from Dr. Pei-Ju Liu (professor of online education at Central Michigan University):

1. Check before you post. Always check whether a similar question has been posted and answered on the discussion board to avoid duplicated messages and responses.
2. Use a descriptive subject line that reflects the content of your message for effective discussion / communication
3. Write in short paragraphs. If you have lots to say, break it down using smaller segments, so it is easier to read and follow.
4. Do not write in all uppercase. USING ALL CAPS MEANS YOU ARE SHOUTING although you may not intend to.
5. If you'd like, use emotional symbols (:-), ;-), :-(, :`-(, :-p, etc.) to indicate the tone of voice. It is hard to tell the emotion of a text-based message.
6. Avoid sarcasm as it often is interpreted as rude and hurtful.
7. Do not edit or change message content when someone has already responded to you. If you have something to add or change, simply add a follow-up message.
8. People in this course may come from places around the world, so be respectful to other cultures and languages.
9. Respect others. Like all communication and discussion occasions, use your professionalism and respect others. Unprofessional messages will be removed.
10. Points will be deducted for failing to comply with this online communication policy. Students who are abusive or rude may be banned from posting. Serious violation may be reported and result in further academic and/or disciplinary action.

C. Syllabus Quiz. (DUE: 2/7, 2 points)

To ensure an understanding of how this online course will operate, there will be a brief (6 question) quiz. This will be posted by February 1st and due February 7th at 4:10pm. You will need to take it in one sitting (once you start it, you will need to finish so make sure you have about a half hour of dedicated time). Note that we will review the syllabus on February 1st so you may want to wait until after class to take the quiz.

D. Statement of Need: (DUE: 3/21, 10 points)

Individually, write a 2-3 page brief literature review which makes the case for a data-driven, theoretically-driven program of public health significance, addressing an

important and current UNMET need. This review should contain at least 8-10 references of journal articles related to a health promotion or research on a community health issue. This review should serve as a research source for the needs development and proposed program in your group proposal.

E. Proposal Draft Part I. (DUE: 4/4, 15 points)
In your assigned groups, students will select a local community-based organization for which to develop and write the proposal (by February 4th; Google Doc to sign up posted in Course Materials titled "Group Assignment- Organizations").

Each group will submit one draft proposal that includes the following proposal sections: statement of need (1-2 pgs.), project goals/objectives (1-2 pgs.) and methods (1 pg.). In addition, create a 1-2pg. table of prospective funders with a brief description of your funding search (include databases & search terms used). This table should include approximately 5-10 funders and the following column headings and corresponding information for each potential funder:

- Name of funder, Subject area they are interested in funding, Geographic Focus, Keep/Remove and Notes. In the Notes column give justification for keeping or removing this funder on your refined list of final potential funders.
    - If funders have a long list of subjects, just put those that are relevant to your program (in the Subject area). Add a note if this is an abbreviated list.
- Note: this table font size can be reduced to 8 points or above and does not need to be double spaced

F. Mock Proposal Evaluation. (DUE: 5/2, 15 points)
Students will write a 2-3 page evaluation of a grant proposal, assuming the role of a reviewer/funder. Proposal will be provided two weeks prior to assignment due date.

G. Foundation Center Workshop. (DUE: 5/2, 5 points)
Students are required to attend one workshop of their choice at the Foundation Center. Please sign up for workshops online in advance, as they fill up.. These workshops are usually 1 hour in length & free of charge:http://www.grantspace.org/Classroom/training-calendar/New-York A brief description of the workshop you attended and what you learned will need to be submitted to the BlackBoard Discussion Forum "Foundation Center Workshop" by May 2nd. Note that the longer you wait to go in the semester, the more likely that the seminar you choose may seem redundant. Try to go as early in the semester as possible.

H. Final Group Proposal. (DUE: 5/9, 15 points)
As a group you will assume the role of the organization for which you have been assigned. Your proposal should be directed towards a specific funder/foundation. Note that the program you propose needs to be created independently (in your groups), without replicating an existing program at your organization in its current form. You are also not able to use any written materials provided by the organization. The final

proposal should incorporate edits from the first draft and should include the following sections:

a. Cover letter (1 pg.)
b. Title page & table of contents (1 pg.)
c. Executive summary (1 pg.)
d. Narrative
    i. Statement of need (2 pgs.)
    ii. Project description (4-5 pgs.)
        1. Goals/objectives
        2. Methods
        3. Evaluation
        4. Sustainability
    iii. Organization information (1-2 pgs.)
    iv. Conclusion (2 paragraphs)
e. Budget spreadsheet (1 pg.)
f. Budget justification (1-2 pgs.)
g. Appendices & supporting materials (optional)
h. References (no page limit)

I. Oral Presentation. (DUE: 5/16, 10 points)

Each group will present as a whole on their program proposal, but students will be graded individually. Each student will have 5 minutes to present. The presentation should be given as if to potential funders. As a group you will uploaded one audio-recorded PowerPoint presentation. (Please identify yourself at the start of your section.)

J. Group Peer Evaluations. (DUE: 5/16, 5 points)

5% of your final grade will be an average of your peer evaluations for your group work. The group member evaluation template form is posted on BlackBoard and due on 5/16 (at 4:10pm). No late assignments will be accepted. If you do not submit this evaluation by the deadline, your own score will be deducted by 1 point and be default your score for your group members will be considered the highest score.

K. Oral Presentation Response. (DUE: 5/23, 5 points)

Individually, you will listen/watch at least four group presentations (not your own group's) and provide substantive feedback or questions on their presentation and proposed programs (4 points). Please submit these responses prior to the deadline, to allow fellow classmates ample time to respond to your comments or questions. For questions or comments on your own group's oral presentation, at least one group member will need respond by 4:10pm on 5/24 (1 point); you can decide collectively as a group who will respond to what. If no group member responds, all group members will be deducted 1 point.

The relative weight of each course component is as follows:

Assessment	**Type**	**Weight**
Attendance	Individual	3%

Discussion Board Participation	Individual	15%
Syllabus Quiz	Individual	2%
Statement of Need	Individual	10%
Proposal Draft Part I	Group	15%
Mock Proposal Evaluation	Individual	15%
Foundation Center Workshop	Individual	5%
Final Group Proposal	Group	15%
Oral Presentation	Group (graded individually)	10%
Group Peer Evaluation	Individual	5%
Oral Presentation Response	Individual	5%
	TOTAL	**100%**

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the

student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Attendance online will be required for 3 synchronous classes (see schedule below). Your attendance grade will be based on your arriving in the chat room on time (class will start promptly at 4:10pm) for all 3 classes.

Participation in class discussion and Blackboard (when assigned) is vital in this course. Your participation grade will reflect consistent, thoughtful contributions to the discussion forums. See descriptions above for attendance and participation grades.

Late/incomplete submission of assignments

***Late Submission of Assignments:**
All assignments are expected to be completed on time. All assignments are due at 4:10pm via BlackBoard on the due date noted (unless otherwise specified). **DO NOT SEND AN E-MAIL REQUESTING AN EXTENSION ON THE DAY THE ASSIGNMENT IS DUE.** With the exception of cases involving critical extenuating circumstances, late submissions of written assignments will be penalized 5 points (out of 100) each day it is late (*including weekends*). **After 5 days of lateness, you will not receive credit for the assignment(s).** No late submission of Discussion Group Forums will be accepted, again except in cases involving critical extenuating circumstances.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites or extra credit for this course.

Expectations of students

Being successful as a student in an online course takes much self-discipline and motivation. Be mindful of figuring out the best strategy to pace yourself to keep up with the many various assignments and assessments in this course. Your active participation is critical in creating an engaging online course and maximizing what you learn from the material.

The online classroom is a community. Respectful interaction with the instructor, classmates, and guests is expected at all times. Public health deals with controversial issues from multiple perspectives and consideration of these issues may cause disagreements among us or may evoke strong personal feelings, depending on our individual experiences, histories, identities and worldviews. Therefore, in all of

interactions and communications, it is important that students strive to demonstrate mutual respect for one another and for any course guests and members of the community with whom they come into contact.

All students must enroll in BlackBoard. BlackBoard will be used on a routine basis as a learning tool to distribute course materials, as well as to facilitate communication with the instructor and classmates. You are expected to check the Discussion Forums regularly. You are expected to check your Hunter email daily for course updates.

Expectations for the instructor
I will post relevant announcements via BlackBoard. Direct any inquiries to the instructor via e-mail. A response can be expected within 72 hours (unless otherwise specified), but I often respond within <24 hours. Assignments will be graded within two weeks (unless otherwise specified).

Suggested (optional) readings and resources:

- Clarke, Cheryl A. (2009). Storytelling for Grant Seekers: A Guide to Creative Nonprofit Fundraising, 2nd edition. Jossey-Bass.

- Foundation Center's Guide to Proposal Writing: Appendix B & C
  Foundation Center: http://foundationcenter.org/
  The Foundation Center is a premier resource for finding funding, offering training for proposal development and more. They offer free seminars on various topics, open to all.

- Guidestar: http://www.guidestar.org/rxg/about-us/index.aspx
  Guide to Nonprofit fundraising:
  http://www.guidestar.org/ViewCmsFile.aspx?ContentID=4718

- Kressin, NR, Saha, S, Weaver, F, Rubenstein, L, Weinberger, M. (2007). Career and time management strategies for clinical and health services researchers. *Journal of General Internal Medicine*. 22(10): 1475-8.
  Although most students are not necessarily health services researchers, this brief article provides relevant tips for time management- a necessary skill in developing proposals.

- NIH website grants overview: http://grants.nih.gov/grants/about_grants.htm

- Philanthropy New York:
  http://www.philanthropynewyork.org/s_nyrag/bin.asp?CID=5494&DID=15264&DOC=FILE.PDF

- Rath, T. (2007). Strengths Finder *2.0*. Gallup Press.
  A guide for finding and applying your own personal strengths in your career.

- Sechrest, L & Babcock-Parziale, J. (2007). Writing Effective Research Proposals. Public Interest Research Services.

  This book was written specifically for VA HSR&D Proposal writing, but its content is more broadly applicable to research grant writing.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule and assigned readings are subject to change throughout the semester. The "Last Updated" Date on the first page of the syllabus will be updated if a change in schedule is made. Please refer to the Hunter Academic Calendar for important dates including holidays, course meeting dates and withdrawals.

SESSION	DATE	Synchronous?*	TOPIC(s)	ASSIGNED READINGS	ASSIGNMENTS DUE
1	2/1	YES - #1	Review Syllabus and course requirements. Introduction to program planning and grant writing.	**Karsh**: Lesson 1 **Geever**: Ch. 1, 2	*Sign up for an organization for your group project by 2/4* *Syllabus quiz by 2/7*
2	2/8	No	Health Program planning: Need, Goals, Objectives, & Logic models	**Karsh**: Lesson, 7, 8 **Hodges**: Ch 4 **Kellogg** Logic Model Guide Ch. 1 & 2	Discussion Forum #1 – due 2/14 (covers 2/1 & 2/8)
	2/15		**Lincoln's Birthday – College is closed**		
3	2/22	YES - #2	Health Program Planning: Curriculum Development, Program Adaptation ***Guest Lecturer: Sara Flowers, Love Heals***	**Karsh:** Lesson 10, 14 **McKenzie:** Ch. 8	
4	2/29	No	Writing Program Grants for Foundations I (statement of need, project narrative)	**Karsh**: Lessons 4, 5, 6, 9 **Geever**: Ch 3-5	Discussion Forum #2 –due 3/6 (covers 2/22 & 2/29)
5	3/7		**No Lecture: *Please work on group project & attend Foundation Center workshop***		
6	3/14	No	Writing Program Grants for Foundations II (Evaluation, Sustainability)	**Karsh** : Lessons 11, 13 **Geever** : Ch 6, 8, Appendix A	
7	3/21	No	Building a Budget, Packaging the Proposal Searching the Grey Literature ***(John Pell****- slides posted in Course Materials)*	**Karsh** : Lessons 12, 15, Funder's Roundtable I **Geever** : Ch 7, 9, 10	Statement of Need
8	3/28	No	Finding Foundation Funding	**Karsh**: Lesson 2 **Geever**: Ch 11, 12	Discussion Forum #3 –due 4/3 (covers 3/14, 3/21 & 3/28)
9	4/4	No	Strategies to Maximize Success	**Karsh**: Lesson 3, Funders' Roundtable II, Appendix I **Geever**: Ch 17 **Myers** 2012; **Sung** 2009	Proposal Draft I
10	4/11	YES -#3	What Next? Follow-up and Grant Management ***Guest Lecturer: Candia Richards-Clarke, BOOM!Health***	**Karsh**: Lessons 16, 17 **Geever**: Ch 15, 16	Discussion Forum #4 –due 4/17 (covers 4/4 & 4/11)
11	4/18	No	Understanding the Review Process; Program Implementation & Program	**Karsh**: Funders' Roundtable III, Appendix	

			Fidelity	II **Geever**: Ch 14 **McKenzie:** Ch 12	
	4/25		**Spring Recess – College is closed**		
12	5/2	No	Writing Federal Research Grants I	**Horner** 2007; **Berg** 2007; **Ogden** 2002; **Koppelman** 2012	Foundation Center brief presentation (due by 5/2) Mock Proposal Review
13	5/9	No	Writing Federal Research Grants II	**Review the following NIH websites:** Planning your application: http://grants.nih.gov/grants/planning_application.htm Types of grants: http://grants.nih.gov/grants/funding/funding_program.htm Writing your application: http://grants.nih.gov/grants/writing_application.htm Developing your budget: http://grants.nih.gov/grants/developing_budget.htm Peer review process: http://grants.nih.gov/grants/peer_review_process.htm#Criteria	Final paper due
14	5/16	No	Group Presentations – Post No lecture	No Readings	Discussion Forum #5 –due 5/22 (covers 4/18, 5/2 & 5/9) Oral presentation posted
15	5/23	No	Group Presentations – Respond No lecture	No Readings	Oral presentation response Group member evaluation

*If a class is listed as synchronous, that means you will need to attend class online via BlackBoard Collaborate that day from 4:10-5:55pm. More information will be posted about using Collaborate. Also visit: http://www.cuny.edu/about/administration/offices/CIS/functions/bb/userguides/blackboardcollaborate.html

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

EOHS70N01 Environmental Research, Writing & Evaluations

2 Credits

& PH78301 (1 credit)

Spring 2016

Time and location	Tuesday 6:05-7:50, Silberman 320
Instructor	Elizabeth Glass Geltman, JD, LLM eg86@hunter.cuny.edu cell: 202-320-4520 Brian Pavilonis, PhD Bp305@hunter.cuny.edu Office phone: 212-396-7739
Office hours	Geltman: Tuesday & Wednesdays 4-5:50pm Pavilonis: Tuesday 4:00-5:30 p.m. Wednesday 7:00-8:00 p.m.
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course provides an overview of environmental and occupational research and writing techniques. The course explains how to conduct a rapid literature review, how to use research and citation software and how to use widely available spreadsheets programs (such as Excel and Google Sheets) to analyze and present data. The course provides an overview of environmental and occupational databases online and how to use data to investigate environmental and occupational health problems.
Course prerequisites	None
Course format	Hybrid
Required reading and resources	Health Research Methods, Author: Kathryn Jacobsen, Publisher: Jones Bartlett
Suggested reading and resources	List optional reading and learning resources

Program Competencies	**Course Learning Objectives**	**Assessment Methods**
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Apply the core functions of PH practice (assessment, policy development, and assurance)	· Identify and frame a research question · Conduct a literature review to help answer your research question	· Rapid lit scan · Research paper
2.Understand basic theories, concepts, models and methods from a range of core and related disciplines and apply them to the design of PH research, policy, and practice.	· Apply PH theory to recommend policy changes and interventions based on research findings	· Research paper
3.Use basic statistical and informatics techniques	· Apply basic statistical methods to answer a research question	· Data analysis
4. Explain key social, behavioral, biomedical, and environmental determinants of and inequities in health and disease across the lifespan in urban settings	· Identify susceptible populations · Recommend policy changes to alleviate the disease burden among these groups	· Research paper
5. Describe the legal foundations of the US PH system and its interrelationships with other systems (e.g. health care, education, environmental protection)	· Identify policy gaps as it pertains to your research question	· Rapid lit scan · Research paper
6. Design and evaluate interventions to prevent or control urban public health problems	· Provide policy recommendations based on research findings	· Research paper

Course Assessments

Students will work together through a series of research assignments culminating in both written work product and a recorded presentation. Students will work through the research assignments in groups of four organized based on similar topics. The assignments are designed to both refine research skills and allow students to explore one aspect of environmental and occupational health in depth. Although students will work together in groups through most of the research modules (RMs), the final work (draft paper, peer reviews and final paper) will be done individually. This term the class will look at various aspects of the public health risk associated with shale gas extraction (what the public calls “fracking”).

Students will begin by selecting one of the following research groups:

Group 1: What’s OSHA Got to Do With It?
Suggested Topics:

1. Worker Health Implications of Radiation in Shale Gas Extraction (aka fracking)
2. Accidents in Shale Gas Extraction
3. Reducing Fatality Rates and Hazards to Oil and Gas Extraction Workers
4. Health Impacts of Silica in Shale Gas Extraction
5. Health implications in first responders
6. Exposure of gas field workers (and neighbors) to toxic chemicals from drilling additives

Group 2: Water Pollution
Suggested Topics:

1. Public Health Implications of Methane Intrusion into Water from Shale Gas Extraction (aka fracking)
2. Public Health Implications of Radiation (NORM/TENORM) in flowback and produced waters from Water Shale Gas Extraction (aka fracking)
3. Contaminated water management -- flowback and produced waters
4. Patterns in surface water contamination
5. Biological contamination of water sources (e.g., risk of contaminating aquifers with sulfate reducing bacteria)

Group 3: Water Allocation
Suggested Topics:

1. Patterns in Water Withdrawal from Shale Gas Extraction & Drought
2. Implications of water withdrawal and water cycle/ecology

Group 4: Air Pollution/ Climate Change
Suggested Topics:

1. Public Health Implications of Venting Methane in Shale Gas Extraction (aka fracking)
2. Fugitive emissions & impact of EPA green completion rules

3. “Downwinders syndrome”
4. Protective measures: comparative state set-back requirements
5. GHG emissions during each phase of shale extraction
    a. horizontal drilling
    b. hydraulic fracturing
    c. transportation of water
    d. transportation of wastewater
    e. treatment of wastewater and solids

Group 5: Chemical Exposure
Suggested Topics:
1. EDCs & Chemicals Used in Shale Gas Extraction: BTEX
2. EDCs & Chemicals Used in Shale Gas Extraction: Naphthalene
3. Obesogens & Chemicals Used in Shale Gas Extraction
4. “Shale Gas Syndrome”

Group 6: Social & Other Impacts
Suggested Topics:
1. Impact on local health systems
2. Risk of certain health issues
3. Noise pollution
4. Traffic accidents
5. Landscape impacts
6. Threatened & endangered species
7. Boom/Bust Cycle
8. Seismic impacts
9. Severance tax (use for local economies, including medicare/caid & education)
10. Exportation of LNG & national defense

Literature Scan
The purpose of the rapid literature scan is to quickly familiarize yourself with a research topic. For the literature scan you will need to identify at least 15 articles, from either government documents or peer-reviewed literature and construct an evidence table. This initial literature review scan will help develop your research question.

Data Analysis
A dataset will be provided to you for analysis. You will be responsible for using the statistical techniques discussed in class to analyze and interpret the data using EXCEL or SPSS. You will then use the data to produce tables.

Research Paper
A 10-12 page, double-spaced, research paper is required of all students. Each student will select a research topic from an approved topic list. Grading will be based on content, quality of

research, organization, and effectiveness of presentation. Sources must be included as in text citations (AMA) and a reference list must be included at the end of the paper. We recommend using endnote, write-n-cite or other citation software to assist your paper. Please no plastic binders/covers. Use plain white paper, stapled at the top.

The due date for the draft paper is indicated on the syllabus. The draft paper will be distributed to other students for peer review. Instructions and a grading rubric for peer review will be provided during the semester. If you fail to hand in a draft paper prior to the due date you will lose points for both the rough draft and the peer review. Unless prior arrangements are made, if you do not turn in all three of your peer reviews on time, you will both lose points for failure to the assignment and your final paper will not be graded.

A final draft of your research paper is due according to the date on the syllabus. The final draft must incorporate your revisions requested by your peers and instructors. Include a copy of your paper with track changes so we can see the changes you made from your draft to your final copy. Discuss questions about peer review comments first with the peer who wrote the comments; see the instructors for any further questions or concerns about peer review comments.

Peer Review

All students will be assigned three draft papers for review. Peer reviewers are responsible for marking up their peers' paper and filling out a grading rubric. Each student will meet with their peers and discuss ways to improve each other's work. The peer-review is a valuable part of the research process and significant time and effort should be put into this assignment.

Warning: Students that do not complete all three peer reviews on time will be graded on their draft and will not have any final, revised paper graded by the instructors.

Recorded Presentation

As a final project, students are expected to produce a recorded oral presentation. The presentation can be a video posted on YouTube, a recorded PowerPoint presentation or any other recorded oral presentation or video that you create as a summary of your project.

Attendance and class participation

Class attendance will be taken every day. Students must sign in at the beginning of class. 10% of the final grade is class participation. It is your responsibility to sign in every class period. Students who are not in attendance are, by definition, not participating on that day. Students are expected to complete assignments for each class and engage in discussion during class.

Grading

Evaluation criteria

Students will be evaluated on the assignments outlined above as well as attendance and participation. The relative weight of each assessment is shown below. Formal rubrics for assignments will be provided to the students and can be found on BlackBoard.

Assessment	Weight
Research Modules (including literature scan, rough draft & peer reviews)	22%
Data analysis	20%
Final paper	40%
Recorded Presentation	8%
Class participation	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete

grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies
Attendance and class participation
You are expected to attend all in class lectures. However, you may be excused from one lecture without penalty. Please notify us via email if you will be late or not able to attend the lecture.

Late/incomplete submission of assignments
Assignments handed in 24 hours after the due date will be given 75% credit. No credit will be given for work handed in after 24 hours.

All papers and assignments are due at the beginning of class at 6:00pm. Papers turned in after the beginning of class are considered late.
No papers or assignments will be accepted after the instructor has released answers and/or returned graded work to the class. Once work is returned to the class, the link to the assignment will expire on BLACKBOARD.

Late assignments hold the entire class up and can delay return of graded assignments to other students.

How to Turn In Assignments
All papers must be turned in on BLACKBOARD as an attachment, with a paper confirmation copy turned in at the beginning of class on the date due. Papers that are submitted without a paper confirmation copy or that are not also posted on BLACKBOARD are considered late unless prior written approval is received from the instructor. It is the responsibility of each student to post his or her own assignments on time, even if the assignment is done in a group.

All assignments posted on BLACKBOARD as an attachment must be named using the following formula:

EOHS70N01_S16_
StudentLastName_StudentFirstName_Date_Group#_RM#_AssignmentName

Assignments will not be graded for students or groups not naming files according to instructions.

No papers, internet assignments or other homework will be accepted by email unless prior written arrangements are made with the instructor.

Make-ups, rewrites, and extra credit

As a general rule, there are no make-ups, rewrites, or extra credit assignments in this course. Plan to do your best work and turn your work in on time.

Students will never be given make-ups, rewrites, or extra credit assignments on a case-by-case. The instructors reserve the right to add extra credit assignments or rewrites during the semester to the entire class, as the instructors deem appropriate. If added or allowed, it is the policy of instructors to extend the same offer to all students in the class.

Expectations of students

Students are expected to come to class prepared to discuss the lesson and homework assignments.

Electronics may not be used during class. Please silence your cell phones prior to class the start of class. If it is an emergency and you need to make a phone call please quickly and quietly leave the class. Students texting, checking email or other electronics/ social media during class will be asked to leave the classroom as this is disruptive to the instructors and to fellow students. Everyone should be respectful of others' opinions and questions.

Expectations for the instructors

We are both available for extra help outside of class. Students are encouraged to stop by our offices for help with exams and homework assignments. The classroom is a place for discussion26and we welcome and encourage students' questions about the topics that will be covered in the course.

Professor Pavilonis is available at Bp305@hunter.cuny.edu and Prof. Geltman is at eg86@hunter.cuny.edu during business hours to answer questions by email. **Please do not abuse the email privilege**. Consult the syllabus, blackboard and other course materials first for answers to your questions. Allow 24 to 48 business hours for an email response. Note that we cannot answer email while teaching, in meetings, and while working on research. Students should plan to contact us during business hours. We are often not available and students should not expect to reach us by email after business hours, on weekends, and during holidays.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that

are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester. Revised syllabi will be posted on the course website.

The Spring 2016 academic calendar can be found at the following address http://www.cuny.edu/academics/calendars/spring-2016.html. Please refer to it for information regarding withdrawal dates.

Week	Date	Topic	Assignment(s)	
1 Guest lecture: John Pell	2/2/16 F2F	Course Overview How To Install & Use *Write-N-Cite* How to select & use citation software: Zotero, EndNote, Mendeley, Flow Guest Lecture: John Pell	RM1 (2 points): Go to: http://library.hunter.cuny.edu/citation-tools & install *Write-N-Cite* Select a citation manager and set up an account. Be prepared to explain why you selected the system you did. Set up an account on Zotero.org Identify a topic from the list and join a group. Complete the research survey.	Read: https://www.libraries.psu.edu/psul/lls/choose_citation_mgr.html http://www.refworks.com/refworks/wncdownload.asp
2	2/9/16 ONLINE	Overview of Public Health Implications of Shale Gas Extraction Quick lit	RM2 (2 points): Conduct a Quick Literature Review. Work with your group Record your collective results on Zotero.	Read: How to Write a Literature Review, http://jacobsschool.ucsd.edu/student/student_grad/docs/How_to_Write_an_Effective_Literature_Review.pdf For tips read, http://www.gradhacker.org/2011/08/26/7-ways-to-survive-a-lit-review/
3 BP	2/16/16 F2F	Data analysis 1	RM3 (2 points): Identify data and download. Complete data assignment.	Read: FINDING PUBLIC HEALTH STATISTICS AND DATA SOURCES, http://phpartners.org/pdf/StatsChapterPDF.pdf

				Health Data Tools and Statistics, https://phpartners.org/health_stats.html
4	2/23/16 Online	Research question	RM4 (2 points): Frame three research questions based on your quick lit and your preliminary data analysis. Complete exercise.	Read: Developing a Research Question, http://libweb.surrey.ac.uk/library/skills/writing%20Skills%20Leicester/page_82.htm The Role of Data Analysis in Public Health Surveillance http://mphdegree.usc.edu/the-role-of-data-analysis-in-public-health-surveillance/
5	3/1/16 F2F	Research methods	RM5: Select one research question & outline your research methods (2 points)	How to Write the Methods Section of a Research Paper https://medschool.vanderbilt.edu/meharry-vanderbilt/files/meharry-vanderbilt/public_files/writing%20methods%202004.pdf
6	3/8/16 Online	Lit review 2	RM6: Write a summary of your literature review (2 points)	
7 BP	3/15/16 F2F	Data analysis 2	RM7: You will be provided data. Write a summary of the data and your analysis of it, including a chart or graph (20 points)	Read: Environmental Data Needed for Public Health Assessments - A Guidance Manual http://www.atsdr.cdc.gov/ednpha.html
8	3/22/16 Online	Policy recommendations	RM8: Make 3 policy recommendations based on your research and rank likelihood to put in place, describe obstacles (2 points)	Read: Tips for Writing a Policy Analysis, https://www.american.edu/cas/writing/pdf/upload/Writing-a-Policy-Analysis.pdf
9	3/29/16 F2F		RM9: First Draft (2 points)	
10	4/5/16 Online		RM10: Peer Review (6 points)	
11 EAGG	4/12/16 F2F	Discussion: How to measure effective policy; Last Day Of Environmental Research & Writing		
12	4/19/16 F2F		RM11: Final Paper (30 points)	
13	4/26/16	Spring Break	No Class	
14	5/3/16 F2F	Begin PH78301	Begin OSHA 10 hour	Extra Credit: Blog Post RM12 Due: YouTube or Recorded PowerPoint Presentation (8 points)
15	5/10/16 F2F	PH78301	2nd Week OSHA 10 hour	
16	5/17/16 F2F	PH78301	3rd Week OSHA 10 hour	
17	5/24/16 F2F 6-10pm	PH78301	Final Week OSHA 10 hour	

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CUNY - School of Public Health

EOHS-741 Environmental and Industrial Hygiene Laboratory
4 credits
Spring 2016

Instructor: Prof. Jack Caravanos and Anthony Devito **Thursday 6:05 - 9:45 PM**
Spring 2016 **Room C-14**

Office Hours: M,Th 4:00 to 5:30 pm or by appointment.
Office: Room 720, Silberman Bldg
Office Phone: (212) 396-7780
Email: jcaravan@hunter.cuny.edu , adevito@hunter.cuny.edu
Program Office: Room 720
Pre-Requisites: Pre- or Co-Requisite, EOHS 70500
Course Description: Physical, chemical, and instrumental methods for measuring environmental and occupational contaminants.

Required Reading:

- *NIOSH Manual of Analytical Methods,* NIOSH Publication # 2003-154 at www.cdc.gov/niosh.
- Please print-out specified chapters and bind.
- Homepage for chapter links for PDFs: http://www.cdc.gov/niosh/docs/2003-154/chaps.html
- Supplemental reading materials and web sites will be posted on Blackboard, as needed.

NIOSH Manual of Analytical Methods

- Chapter A - Purpose & Scope
- Chapter B - How to Use NMAM
- Chapter C - Quality Assurance
- Chapter D - General Considerations for Sampling Airborne Contaminants
- Chapter E - Development and Evaluation of Methods
- Chapter F - Application of Biological Monitoring Methods
- Chapter G - Aerosol Photometers for Respirable Dust Measurements
- Chapter H - Portable Electrochemical Sensor Methods
- Chapter I - Portable Gas Chromatography
- Chapter J - Sampling and Characterization of Bioaerosols
- Chapter K - Determination of Airborne Isocyanate Exposure
- Chapter L - Measurement of Fibers
- Chapter M - Sampling and Analysis of Soluble Metal Compounds
- Chapter N - Aerosol Sampling : Minimizing Particle Loss from Cassette Bypass Leakage
- Chapter O - Factors Affecting Aerosol Sampling
- Chapter P - Measurement Uncertainty and NIOSH Method Accuracy Range
- Chapter Q - Monitoring of Diesel Particulate Exhaust in the Workplace
- Chapter R - Determination of Airborne Crystalline Silica

Glossary - Glossary of Abbreviations, Definitions, and Symbols

Additional References:

Plog, B. and Quinlan, P. (eds) *Fundamentals of Industrial Hygiene,* 5th Edition, National Safety Council. 2002.

DiNardi, S. (ed.) *The Occupational Environment—Its Evaluation, Control and Management 2nd edition*. AIHA. 2003.

OSHA Technical Manual, TED-01-00-015, 1999
Available at: http://www.osha.gov/dts/osta/otm/otm_toc.html

International Labor organizations, ILO, Encyclopedia of Occupational Health and Safety, 1998, On Reserve – Silberman Library

Web Address: http://www.ilo.org/safework_bookshelf/english?d&nd=170000102&nh=0

EOHS-741, Environmental and Industrial Hygiene Laboratory - Spring 2016

COURSE OUTLINE

Date	Week	Topic	Reading	Reports
Thurs. 2/4	1	Course Introduction **(Caravanos)** • Env. Laboratories / Analysis / QA / QC • Interpreting consultant reports	Ch. A, B, C	none
2/11	2	Asbestos Fiber Counting and Identification Lecture **(Caravanos)** Asbestos Fiber Counting Laboratory • Using a Phase Contrast Microscope • Fiber counting and calculations	Ch. L NIOSH Method 7400	Data sheet due
2/18	3	Asbestos Polarizing Light Microscopy Laboratory **(Caravanos)**		Data sheet due
2/25	4	Microbial Assessment: –Air and swab sampling **(Caravanos)** Mold sample analysis – Colony morphology • Take-home: environmental mold testing	Ch. F, J	
3/3	5	Microbial Assessment (part 2) **(Caravanos)** Lead Lecture (part 1) • Sampling methods – dust, air and paint • X-Ray Fluorescence detection / Flame Atomic Absorption Spectrophotometry • Take-home: environmental lead testing	NIOSH Methods: 9100 & 7700	Full lab report (mold)
3/10	6	Lead Laboratory (part 2), **(Caravanos)** • XRF Analysis of samples • Blood lead measurements		Full lab report (lead)
3/17	7	***MIDTERM EXAM (online, no class meeting)***		
3/24	8	Air Sampling and Calibration: **(DeVito)** • Air Sampling Methodologies for Vapors, Gases and Dusts • Assembling a sampling train, pump calibration (primary & secondary) • Collecting air samples (particulates, organics)	Ch.D, M, N, O	
3/31	9	Sampling of Organic Vapors **(DeVito)** - Low flow pump calibration, Preparation of sampling train - Sampling with charcoal tubes, passive dosimeters - Sampling with direct readers (OVA, length of stain tubes) - Review of calculations	NSC, Ch. 17; QIH, Section 1-IH Chem, #11, 23, 24	
4/7	10	Indoor Air Quality and Direct Reading Instruments **(DeVito)** • Principles • IAQ monitors • Dust Monitors, PID meters	Ch. G, H, I	
4/14	11	Personal Protective Equipment (lecture and Lab) **(DeVito)** • Qualitative and Quantitative Respiratory Fit Testing • Chemical Protective Suits / SCBA	OSHA-3352	
4/21	12	Assessing Ventilation Systems **(DeVito)** • Use of pitot tubes, swinging vane anemometers, thermo-anemometers • Measuring velocity pressure in a duct with a pitot tube • Selecting the Proper Capture Device • Evaluating capture velocity in front of a hood • Assessing a laboratory hood	Reading: NSC, Ch. 19; QIH, Section 3 Ventilation, # 1-11, 20	
4/28		**Spring Break**		
5/5	13	Assessing Noise Hazards – (Lecture / Lab)		
5/12	14	Assessing Radiation Hazards – (Lecture / Lab) Student Presentations		
5/19	***15***	***FINAL EXAM***		

Use of Blackboard:
All assignments, course documents, notes and presentations will be posted on Blackboard. It is the student's responsibility to check Blackboard frequently for new materials.

Grading:

Midterm Exam:	30%
Final Exam:	30%
Lab Performance/Assignments:	10%
Project Report	30%

Term Project:
The class will conduct an environmental data collection survey. Each student group will conduct a different sampling site using a direct reading instrument survey of an establishment or environment. Details will be provided at the first class session. (Presentations due May 12th).

Course-Syllabus Change Policy:
Except for changes that substantially affect implementation of the evaluation (grading) statement, this course outline is a guide for the course and is subject to change with advance notice. Changes will be announced in class and will be posted on the course Blackboard site.

Policies Concerning Attendance, Missing Tests, Handing in of Assignments, Grading, Extra Credit, and Incomplete grade:

- Students should contact instructor prior to absence (email or voicemail is acceptable).
- It is the students' responsibility to obtain class notes from a colleague.
- Make-up tests will be given only under extraordinary circumstances. It is the student's responsibility to inform the instructor of these circumstances **before** exam day and to make alternate arrangements.
- 2 points will be deducted for assignments handed-in after the due date. 5 points will be deducted from assignments handed in more than 1 week late.
- Assignments must be handed in as hard copy in class. E-mailed assignments will not be accepted.
- Final grades are based on the weighted average of assignments and exams as described above. There will be no opportunity to do additional work for extra credit.
- Incompletes are given only under special circumstances. If student cannot complete the course, this must be discussed with instructor. The student must sign an "Incomplete Contract" with the instructor detailing the terms of the incomplete.

Withdrawing from the course:

- Refer to the Hunter College Office of the Registrar for additional requirements and information for dropping or withdrawal from courses.

EOHS Track Competencies	Course Learning Objectives	Most relevant sessions and assignments (objectives are also touched on in other sessions)
This course will help you to achieve the following competencies, which are expected of EOHS track MPH/MS graduates	**After successfully completing this course, you are expected to be able to:**	
TC1. Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	Develop skills to present observations, lab data and conclusions in standardized report format that is consistent with professional practice. Develop ability to identify, describe qualitatively, and quantify agents, factors, and stressors generated by and/or associated with defined sources, unit operations, and/or processes.	2, 3, 6, 9 (lab performance, exams)
TC2. Predict and prevent health, safety and environmental risks from processes, work tasks, the built environment and other economic and/or social activities.	Develop an understanding of the qualitative and quantitative aspects of exposure assessment, dose-response, and risk characterization based on applicable pathways and modes of entry.	1, 13, 14 (Term project, exams)

Hunter College Statement on Academic Dishonesty
Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. To view the entire Hunter College Academic Integrity Policy and Procedure, please go to the Hunter College Senate homepage at www.hunter.cuny.edu/senate/ and click on "Documents

ADA Policy
In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call the Office.

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions.

Grade Appeals
Students will follow the procedures specified in the Hunter College Grade Appeals Procedures (Approved by the Hunter College Senate 10/9/85 – Updated 5-4-05) as posted on the following site:
http://www.hunter.cuny.edu/provost/repository/files/COLLEGE-WIDE%20GRADE%20APPEALS%20PROCEDURES%205-4-05.pdf
This is a progressive process that starts with the instructor and ultimately involves a Departmental/School Grade appeals Committee. The student will initiate the discussions with the instructor and follow the appropriate steps as outlined in the official Hunter grade appeals process.

CUNY SCHOOL OF PUBLIC HEALTH

HUNTER COLLEGE

COURSE SYLLABUS
EOHS 75400: Environmental and Occupational Toxicology
Spring 2016

Time & Location Monday 8-9:45 Room 214 Silberman

EOHS 75400 Environmental and Occupational Toxicology, 3 credits

Spring Semester, 2016	Prof. Franklin E. Mirer, PhD, CIH
Time Monday 8-9:45	Office: Room 722
Room SB 214	Telephone: 212-396-7782
Office Hours: Tues 5:30-6:30, Wednesday 4:30-5:30, and otherwise by appointment	Email: fmirer@hunter.cuny.edu

Course Description and objectives: Introduction to principles of toxicology with emphasis on environment and occupational aspects. Systematic review of the toxicology of major organ systems; health effects of categories of toxins, such as solvents and metals; and review of toxicological testing and evaluation. Required for MS and MPH.

Prerequisite courses: PH 75400 and EOHS 70500

Texts: 1 required book

Casarett and Doull's Essentials of Toxicology Second Edition [Book] by Curtis D. Klaassen, John Barr Watkins

$44 online By Curtis D. Klaassen, John Barr Watkins - McGraw-Hill (2010) - Paperback - 472 pages - ISBN 0071622403

http://en.wikibooks.org/wiki/Human_Physiology/Cell_physiology

Recommended: Kuhn, TS, The Structure of Scientific Revolutions

White, The Elements of Style

Additional readings will be assigned during the term. These will include at least one original research paper, one peer reviewed review paper, and one authoritative recommendations document.

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Course Outline

Session	Date	Topic	Reading
1	2/2	Course Administrative; Introduction, History and Principles Paradigms and Paradigm Cases, Paper and Discussion Board Posting	ET Ch. 1 & 2
	2/9	No class Friday sched	
2	2/16	Mechanisms of Toxicity, Absorption, Distribution and Excretion of Toxicants **Post MSDS and Comments**	ET Ch. 3 & 5 Cells
3	2/23	Biotransformation and Toxicokinetics	ET Ch. 6 & 7
4	3/1	Respiratory System Toxicology **Paper Topic Due –** Discussion of Papers	ET Ch. 15 Respiratory
		Immune System Toxicology	ET Ch 12 Immune
5	3/8	Chemical Carcinogenesis and Genetic Toxicology	ET Ch. 8 & 9
		Risk Assessment **Paper Tentative Literature Summary – at least 10 References**	
6	3/15	Nervous System Toxicology	ET Ch. 16 Nervous
7	3/22	Finish up Mid-term Material - **Paper Strawman Summary**	
8	3/29	**Mid-term**	
9	4/5	Hepatic Toxicology Nervous System Toxicology	ET Ch.13, ET Ch. 4 Gastrointestinal http://en.wikipedia.org/wiki/Liver
10	4/12	Developmental and Reproductive Toxicology	ET Ch. 20 Reproduction (male) — Reproduction (female) — Pregnancy
		Endocrine Toxicology	ET Ch. 21 Endocrine
11	4/19	Kidney Toxicology	ET 14 Urinary
	4/26	Break	
12	5/3	Toxicology of the blood and hematopoietic system **PAPER DUE**	ET Ch. 11 Blood
		Dermal Tox/Cardiovascular Tox **Discussion Board POSTING COMPLETE**	ET Ch. 18 & 19 Cardiovascular Integumentary
13	5/10	Finish up System Tox	ET Ch. 18 & 19
14	5/17	Review	
15	5/24	**Final**	

Educational Outcomes:

This course should contribute to the student's abilities to:

1. Understand and assess occupational and environmental hazard notification systems including Material Safety Data Sheets, Transportation placards, HMIS placards.
2. Identify the origin and scientific basis of various environmental and occupational exposure limits.
3. Describe physiological and/or toxic interactions of physical, chemical, biological, and ergonomic agents, factors, and/or stressors with the human body.
4. Explain environmental and occupational health laws and regulations and be able to suggest appropriate legislative controls.
5. Recommend and evaluate personal protective equipment including respiratory selection, fit-testing procedures and use of chemical protective clothing and/or other interventions to reduce or eliminate hazards.
6. Prepare scientific and technical summaries and reports.
7. Use the Internet to conduct literature searches, database searches and communicate with colleagues in the EOHS profession.
8. Understand and critically analyze published reports on urban health issues.
9. Attain recognized professional certification.

	EOHS 754 Environmental and Occupational Health Track Competencies – MS & MPH	**Course Learning Objectives**	**Assessment Methods**
T1	Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards	• Assess chemical hazard warnings and warning systems • Describe sources and exposure circumstances for chemical hazards of health importance	Class discussion, msds exercise, paper
T2	Predict and prevent health, safety and environmental risks from processes, work tasks, the built environment and other economic and/or social activities.	• Interpret and apply occupational and environmental chemical exposure measurements to assess delivered doses and health risks	paper
T3	Evaluate the human health risks from CBPS hazards using qualitative, quantitative and/or instrumental assessment methods	• Apply biological and chemical principles to explain toxic action of chemicals. • Apply typical occupational and environmental measurements to determining delivered dose of chemicals to people • Describe the origin, scientific basis, implementation and strength and weaknesses of different approaches to risk assessment • Describe the biological basis for occupational and environmental exposure limits	Paper, class discussion, midterm and final exam
T4	Recommend appropriate engineering, personal protection or administrative controls and policies for CBPS hazards and evaluate their effectiveness.	• Describe the bases of occupational and environmental chemical exposure standards and societal processes for change.	paper

	EOHS 754 Environmental and Occupational Health Track Competencies – MS (ABET)	**Course Learning Objectives**	**Assessment Methods**
2	. Study and assess occupational and environmental hazard notification systems such as MSDS and transportation placards.	• Assess chemical hazard warnings and warning systems • Describe sources and exposure circumstances for chemical hazards of health importance	Class discussion, msds exercise, paper

4.	Learn about physiological and/or toxic interactions of physical, chemical, biological, and ergonomic agents, factors, and/or stressors with the human body.	• Interpret and apply occupational and environmental chemical exposure measurements to assess delivered doses and health risks	Paper, midterm and final exam
5	Develop an understanding of the qualitative and quantitative aspects of exposure assessment, dose-response, and risk characterization based on applicable pathways and modes of entry.	• Apply biological and chemical principles to explain toxic action of chemicals. • Apply typical occupational and environmental measurements to determining delivered dose of chemicals to people • Describe the origin, scientific basis, implementation and strength and weaknesses of different approaches to risk assessment • Describe the biological basis for occupational and environmental exposure limits	Midterm and final exam, paper
10	. Learn the origin, scientific basis, interpretation, and application of various environmental and occupational exposure limits and be able to communicate that information to others.	• Describe the bases of occupational and environmental chemical exposure standards and societal processes for change.	paper
11	Become skilled at evaluating, recommending, and putting into practice administrative and engineering controls and personal protective equipment to reduce or eliminate occupational hazards.	• Interpret averaging periods for occupational and environmental exposure standard	Paper, msds exercise
19	Acquire the knowledge needed to attain recognized professional certification.	• Answer typical questions from industrial hygiene certification exams	Final and midterm exam

Pre-Class Preparation

All students are expected to have read the assigned chapters in each book prior to each class. Examinations may include this material and it may only be reviewed quickly in class if at all. Students should assume that "key points" in the ET chapters will appear on exams, since these points will likely appear on IH certification and other future professional exams.

Another resource that may be helpful regarding the physiology material is the following website:

http://homepage.smc.edu/wissmann_paul/anatomy1/

While this material will not be on exams unless covered specifically in class, it can be helpful to fill in the large gaps that the physiology book will leave. Finally, Chapters 22 (sections on Insecticides and Rodenticides), 23 (Entire Chapter) and 24 (Entire Chapter) will be covered at various points in conjunction with sections on organ system toxicity. Students should read these Chapters immediately after the mid-term in order to be prepared.

Required Paper

An EOH professional may be called on to explain divergent exposure limits, for example, why an occupational limit is so much higher than an environmental regulation, or why two occupational exposure limits diverge. Select an exposure or agent of interest for which there are divergent limits. You are responsible for finding environmental reference levels for agents whose primary exposure is occupational. You are the health and safety professional for a facility using that chemical and potentially releasing that agent into the environment. Your selection of agents and circumstances will be discussed with the instructor and fellow students. Prepare a summary of toxicity information (routes of exposure, transport in the body, target organ effects, mechanisms of toxicity and metabolism, body burden measurements if applicable) and an explanation for different limits. You should consult at least one authoritative recommendations document, which may the preamble and explanation of an OSHA standard, or the Documentation for a TLV, or can be found at
http://www.epa.gov/iris/subst/index.html
http://www.atsdr.cdc.gov/toxpro2.html
http://www.cdc.gov/niosh/critdoc2.html

The writing must be yours. Text taken from documents or the internet must be indicated with quotes and appropriately cited. Discussion with the instructor and other students is encouraged.

Guidelines:
1. Approximately 2000 words (Not counting title page and bibliography.)
2. Paginated. Figures and tables should be included in the document after the references, one to a page, separated by page breaks.
3. Must contain at least 10 different references, 5 from peer-reviewed journals; documents explaining the exposure limits (Documentation for TLV's, IRIS summaries, OSHA standards explanations) should be cited. Citations should be formatted appropriately.
4. Internet citations are OK, but full web site address must be cited, and the site must be from a government agency or a university. Wikipedia is not acceptable. Generally .com domain addresses are not acceptable.
5. Deadlines are essential and are contained in the Course Outline. Late paper counts against you.
6. The paper must have a statement of key points at the top: identity of substance, major exposure situations, contrasting exposure limits and agencies, and the key reasons the agency gives for why limits contrast. This section should consist of bullet points and be set off by typeface in a box.
7. Single spaced, submitted electronically in Word or RTF format unless arrangements have been made for alternative presentation.

Grading of the paper will be based on:
1. The presentation: did the paper follow the ground rules?
2. The cohesiveness of the argument: is there a logical flow to the paper, do the sections fit together, do the recommendations and conclusions follow from the information presented?
3. The extent to which the paper reflects an understanding of the material gleaned from the journals and other information sources.

4. Writing skills: grammar, spelling, punctuation (to the extent that they enhance or dampen understanding of the paper)

The paper topic [target substance] should be selected and submitted no later than (4th meeting) and posted to the discussion board. The tentative literature review working bibliography should be posted to the discussion board by (5th Meeting), A strawman summary listing the exposure limits to be compared, and their sources should be submitted by (7th Meeting) and posted to the wiki. These early dates are to give an opportunity for direction and correction. The final paper is due (12th Meeting), to permit classroom discussion. Electronic submission of the paper and posting to the discussion board is required.

Discussion Board
A toxic events discussion board will be created in the course blackboard site. You are required to post at least one entry to this discussion board and at least one comment on another posting. A satisfactory blog post shall consist of a reference and link to a journalistic or scientific publication, an extract or abstract of the publication, and a commentary identifying the agent and reasons why others in the class should be interested in the matter. The commentary must be at least four sentences. You may be asked to discuss your posting in class.

Grades
Grades will be assigned as follows:

Mid-term	30%
Final	40%
Paper	15%
MSDS Posting	5%
Class Participation	5%
Discussion Board Posting	5%

Examination format typically consists of multiple choice and fill in the blanks questions. Exams will emphasize recall of specific information, in contrast to the paper which will emphasize discussion. A perfect score on an examination is unlikely to be 100, scoring of questions may be modified during the grading process. The mid-term and final exam are independent, the final exam is not cumulative. However, some material discussed after the midterm is linked to pre midterm and thus may appear on the final.

The final grade will be assigned based on the weighted average of component scores in relation to the median and distribution of class scores.

Policy on Incompletes
Refer to Urban Public Health School Policy.

Academic Honesty
A statement on academic honesty was passed by the Hunter College Senate in Spring 2005 and is required on all course syllabi. Each syllabus must state, “Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.”

Please refer to the Hunter College Catalog for more information.

Services For Disabled Students
The Office of Disabled Students is located in Student Services, 1128 East Building, 772-4857. Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life’s basic functions.

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

EOHS75700 Principles of Industrial Hygiene
3 Credits
Spring 2016

Time and location	Silberman Room 214 Wednesday 8:00-9:45 p.m.
Instructor	Brian Pavilonis, Ph.D. Bp305@hunter.cuny.edu (preferred method of contacting me) 212-396-7739 Silberman Room 534
Office hours	Tuesday 4:00-5:30 p.m. Wednesday 7:00-8:00 p.m.
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Recognition, evaluation, and control of industrial hazards due to chemical and physical agents. Topics include occupational health standards, regulatory agency activities, effects of contaminants on human health, sampling and control of hazards, and current issues.
Course prerequisites	EOHS 70500 & EOHS 70200 or equivalents
Course format	In class lecture
Required reading and resources	Fundamentals of Industrial Hygiene, Author: Barbara Plog, Publisher: National Safety Council, Edition: 6th, Year Published: 2012 Lecture slides posted on Black Board
Suggested reading and resources	Supplemental reading assignments will be posted on Blackboard or available online. It is the student's responsibility to keep track of supplemental reading assignments.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Apply the core functions of PH practice (assessment, policy development, and assurance)	Apply course information including workplace assessment factors to evaluate worker exposures and recommend effective controls for specific occupational exposure hazards.	• HW #5 and #6 • Test #2
2. Understand basic theories, concepts, models and methods from a range of core and related disciplines and apply them to the design of public health research, policy, and practice	Understand the scientific disciplines that contribute to the ability to recognize and control occupational exposures that may lead to work-related diseases. Acquire the knowledge needed to attain recognized professional certification.	• All assignments and tests
3. Use basic statistical and informatics techniques	Develop an understanding of personal protective devices, and exposure controls. Develop ability to recognize hazards and correctly protective measures best suited for work operations. Apply OSHA severity and significance calculations to compare worker exposure levels to occupational exposure limits.	• HW #6 • Test #2
4. Explain key social, behavioral, biomedical and environmental determinants of and inequities in health and disease across the lifespan in urban settings.	Recognize and identify at-risk work operations and tasks typically performed by low wage and unskilled workers. Apply preventive strategies utilizing recognized protective strategies (PPE-engineering/administrative controls and sustaining programs) that greatly reduce these workplace exposures and prevent associated occupational disease.	• HW#6 • Test #2
5. Design and evaluate interventions to prevent or control urban public health problems	Describe the hierarchy of controls designed to protect workers, and provide examples of each level of control. Understand work processes, tasks and exposure factors that contribute to airborne exposure risks and physical hazards. Understand how to devise controls that best address these specific hazards.	• HW #3, #4, #5, and #6 • Test #1 and Test #2
6. Describe the legal foundations of the US public health system and its interrelationships with other systems (e.g. health care, education, environmental protection)	Interpret and apply applicable occupational and environmental regulations with regard to the need for controls. Explain environmental and occupational health laws, consensus standards and regulations pertinent to workplace conditions and to recommend improvements and updates to pertinent regulations	• All assignments and tests

Environmental and Occupational Health Sciences Specialization Competencies	**Course Learning Objectives**	**Assessment Methods**
This course will help you achieve increased competency in environmental and occupational health sciences. By the time you graduate, you should be able to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	Understand work processes, tasks and exposure factors that contribute to airborne exposure risk for workers and apply industrial hygiene principles to reduce these exposure risks.	• All assignments and tests
2. Predict and prevent health, safety and environmental risks from processes, work tasks, the built environment and other economic and/or social activities.	Understand, and to the extent possible become familiar with examples of common industrial processes, operations and manufacturing techniques found in the US. Understand work processes, tasks and exposure factors that contribute to airborne exposure risk and physical hazards for workers and apply appropriate control principles to reduce these exposure risks. Identify effective and sustaining controls for at-risk work operations and tasks typically performed by low wage and unskilled workers. Understand the scientific disciplines that contribute to the ability to recognize and control occupational diseases.	• HW#6 and #7 • Test #2
3. Evaluate the human health risks from CBPS hazards using qualitative, quantitative and/or instrumental assessment methods.	Understand the scientific disciplines that contribute to the ability to recognize and control occupational diseases. Describe routes of entry to chemicals in the occupational environment. Be familiar with recognized design and performance considerations for effective and efficient operation of local and general exhaust ventilation systems, noise controls, PPE and radiation shielding.	• HW #3, #4, #5, and #6 • Test #1 and Test #2
4. Recommend appropriate engineering, personal protection or administrative controls and policies for CBPS hazards and evaluate their effectiveness.	Describe the hierarchy of controls designed to protect workers, and provide examples of each level of control. Understand and develop work process flow charts for several industries, and interpret and apply occupational safety and health regulations to reduce exposure risks. Apply knowledge gained during this course to prescribe occupational health management programs to control physical hazards and specific airborne environmental and occupational exposure hazards. Acquire the knowledge needed to attain recognized professional certification. (e.g., CIH, CHMM, CSP)	• HW#6 • Test #2

Course Assessments

Your understanding of the course material will be evaluated through homework, class participation, a midterm exam, and a final exam

Grading

Evaluation criteria

Exams
Two, equally weighted, take home exams will be given. Exams are due on the date listed above. Exams should be written legibly with all calculations shown. Exams can be scanned and submitted via email or handed in to the instructor.

Homework
Seven, equally weighted, homework assignments will be given throughout the course. It is due prior to the start of class. You must show all your work and write legibly in order to receive full credit. We will spend a significant portion of class time going over the solutions to problems and you will be called on in class to present answers.

Attendance and class participation
Class attendance will be taken every day. Students must sign in at the beginning of class. 10% of the final grade is class participation. It is your responsibility to sign in every class period.

The relative weight of each course component is as follows:

Assessment	Weight
Class participation	10%
Homework	30%
Midterm exam	30%
Final exam	30%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

You are expected to attend all lectures. However, you may be excused from two lectures without penalty. Please notify me via email if you will be late or not able to attend the lecture.

Late/incomplete submission of assignments

Homework and exams handed in 24 hours after the due date will be given 75% credit. No credit will be given for work handed in after 24 hours.

Make-ups, rewrites, and extra credit

No make-ups, rewrites, or extra credit assignments are allowed and under what conditions.

Expectations of students

Students are expected to come to class prepared to discuss the lesson and homework assignments.

Please silence your cell phones prior to class the start of class. If it is an emergency and you need to make a phone call please quickly and quietly leave the class. Please refrain from texting and checking email while in class as this is disruptive to the instructor and fellow students. Everyone should be respectful of others' opinions and questions.

Expectations for the instructor

I am available for extra help outside of class. Students are encouraged to stop by my office for help with exams and homework assignments. The classroom is a place for discussion and I welcome students' questions about the topics that will be covered in the course.

I am available by email at Bp305@hunter.cuny.edu during business hours to answer questions by email. Please do not abuse the email privilege. Consult the syllabus, blackboard, and other course materials first for answers to your questions. Allow 24 to 48 hours for an email response. I cannot answer email while teaching, in meetings, and while I am working on research. I am often not available by email after business hours, on weekends, and during holidays.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester. The revised syllabus will be posted on the course website.

The Spring 2016 academic calendar can be found at the following address http://www.cuny.edu/academics/calendars/spring-2016.html. Please refer to it for information regarding withdrawal dates.

Session	Date	Topic	Readings and Homework
1	2/3/2016	Introduction	Chapter 1 Appendix C
2	2/10/2016	IH statistics and toxicology	Appendix D Chapter 6 HW #1 due
3	2/17/2016	Basic IH calculations	Chapter 15 HW #2 due
4	2/24/2016	Airflow calibration	Whitebook- Ch. 8
5	3/2/2016	Sampling for gasses and vapors	Chapter 7 HW #3 due
6	3/9/2016	Respiratory deposition and particulate sampling	Chapter 8
7	3/16/2016	Asbestos, mineral fibers, and silica	HW #4 due
	3/23/2016	No Class	
8	3/30/2016	Exam	
9	4/6/2016	Occupational exposure assessment	Whitebook- 15
10	4/13/2016	Direct reading instruments	Chapter 17
11	4/20/2016	Indoor air quality	OSHA IAQ Reading HW #5
	4/27/2016	Spring break	
12	5/4/2016	Occupational controls	Chapter 18 & 22
13	5/11/2016	Biological Hazards	Chapter 14 HW #6 due
14	5/18/2016	Biomonitoring	Whitebook- Ch. 13
15	5/25/2016	Exam	HW #7 due

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

EOHS 76500 Environmental Audits & Remediation

3 Credits

Spring 2016

Time and location	Wednesday 6:05-7:50, Silberman 326
Instructor	Elizabeth Glass Geltman, JD, LLM eg86@hunter.cuny.edu cell: 202-320-4520
Office hours	Geltman: Tuesday & Wednesdays 4-5:50pm
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Introduction to environmental investigation and remediation technologies commonly used in professional practice. Presents proper practices for assessing and remediating asbestos, lead-based paint, indoor air quality, and underground storage tanks situations and Phase I site audits.
Course prerequisites	PH 75000 or 75100
Course format	Hybrid
Required reading and resources	There is no assigned textbook for this course. All reading materials are posted on BlackBoard.
Suggested reading and resources	All suggested and optional reading materials are posted on BlackBoard.

Program Competencies	Course Learning	Assessment Methods

	Objectives	
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify and describe environmental and occupational sources of chemical, biological, physical and/or safety (CBPS) hazards.	Explain how to conduct a comprehensive Phase I environmental site assessment of an industrial or residential property Explain the major tasks of a Phase II environmental site assessment. Explain approaches to identifying common urban environmental hazards, such as asbestos containing materials, lead-based paint, radon gas and other building-related hazards.	Group project; homework assignments; research paper; exam
Evaluate the human health risks from CBPS hazards using qualitative, quantitative and/or instrumental assessment methods	Interpret a Phase I and II Environmental Site Assessment reports and critically evaluate the findings Evaluate sampling data from surveys of hazardous materials such as asbestos containing materials in buildings, lead based paint hazards, poor indoor air quality and radon gas	Group project; homework assignments; research paper; exam
Recommend appropriate engineering, personal protection or administrative controls and policies for CBPS hazards and evaluate their effectiveness.	Demonstrate a working knowledge of commonly used remediation practices for the management of asbestos containing building material, lead based paint,	Group project; homework assignments; research paper; exam

	contaminated properties, mold and radon gas	

Course Assessments

Homework Assignments (20 points):

There are 10 homework assignments that will comprise 20% of your grade. These assignments are found in the class folders and are designed to: (1) improve your internet searching skills, (2) introduce you to important sites containing environmental audit and remediation information on the internet; (3) allow you to identify and explore various databases and public sources of information valuable in the environmental audit and remediation process and (4) aid in your understanding of environmental health and environmental protection programs.

The assignments generally involve searching an environmental or public health web site for specific information. Once found, you must submit your answers in the space provided on BlackBoard.

Internet assignments are graded on a 2-point scale using the following formula:

2—on time & 75% or more correct & posted as instructed on BB

1—no more than 1 day late or 25% to 75% correct & posted as instructed on BB

0 – not turned in, more than 1 day late, less than 25% correct or not posted as instructed on BB

Research Paper (10 points)

The research paper requires students to consider a cutting edge issue in environmental audits or remediation. A list of suggested topics will be provided.

Group Project (50 points)

Students will work in groups on a cutting edge issue of environmental health relating to environmental audits and remediation. Students will be randomly assigned to groups. The topics and techniques needed to conduct the study will be explained in class.

Attendance and class participation (10 points)

Class attendance will be taken every day. Students must sign in at the beginning of class. 10% of the final grade is class participation. It is your responsibility to sign in every class period. Students who are not in attendance are, by definition, not participating on that day. Students are expected to complete assignments for each class and engage in discussion during class.

Grading

Evaluation criteria

Students will be evaluated on the assignments outlined above as well as attendance and participation. The relative weight of each assessment is shown below. Formal rubrics for assignments will be provided to the students and can be found on BlackBoard.

Assessment	Weight
Homework Assignments	20%
Group project	50%
Research Paper	10%
Exam	10%
Participation/ Student Timesheet	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

You are expected to arrive on time and attend all in class lectures. You may, however, be excused from one lecture without penalty. Please notify me via email if you will be late or not able to attend the lecture.

Students are asked to keep a timesheet of time spent on class work and projects. The purpose of the timesheet is reflect practice of environmental professionals. Timesheets also help the instructor in course development and student time management.

Late/incomplete submission of assignments

All papers and assignments are due at the beginning of class at 6:00pm. Papers turned in after the beginning of class are considered late. Assignments handed in 24 hours after the due date will be given 75% credit. No credit will be given for work handed in after 24 hours.

Late assignments hold the entire class up and can delay return of graded assignments to other students.

No papers or assignments will be accepted after the instructor has released answers and/or returned graded work to the class. Once work is returned to the class, the link to the assignment will expire on BLACKBOARD.

How to Turn In Assignments

All papers must be turned in on BLACKBOARD as an attachment, with a paper confirmation copy turned in at the beginning of class on the date due. Papers that are submitted without a paper confirmation copy or that are not also posted on BLACKBOARD are considered late unless prior written approval is received from the instructor. It is the responsibility of each student to post his or her own assignments on time, even if the assignment is done in a group.

All assignments posted on BLACKBOARD as an attachment must be named using the following formula:
EOHS765_S16_ StudentLastName_StudentFirstName_Date_Group#_RM#_AssignmentName
Assignments will not be graded for students or groups not naming files according to instructions.

No papers, internet assignments or other homework will be accepted by email unless prior written arrangements are made with the instructor.

Make-ups, rewrites, and extra credit

As a general rule, there are no make-ups, rewrites, or extra credit assignments in this course. Plan to do your best work and turn your work in on time.

Students will never be given make-ups, rewrites, or extra credit assignments on a case-by-case. The instructors reserve the right to add extra credit assignments or rewrites during the semester to the entire class, as the instructors deem appropriate. If added or allowed, it is the policy of instructors to extend the same offer to all students in the class.

Expectations of students

Students are expected to come to class prepared to discuss the lesson and homework assignments.

Electronics may not be used during class. Please silence your cell phones prior to class the start of class. If it is an emergency and you need to make a phone call please quickly and quietly leave the class. Students texting, checking email or other electronics/ social media during class will be asked to leave the classroom as this is disruptive to the instructors and to fellow students. Everyone should be respectful of others' opinions and questions.

Expectations for the instructors

I am available for extra help outside of class. Students are encouraged to stop by my office for help with exams and homework assignments. The classroom is a place for discussion and I welcome and encourage students' questions about the topics that will be covered in the course.

I can be reached at eg86@hunter.cuny.edu during business hours to answer questions by email. **Please do not abuse the email privilege**. Consult the syllabus, blackboard and other course materials first for answers to your questions. Allow 24 to 48 business hours for an email response. Note that I cannot answer email while teaching, in meetings, and while working on

research. Students should plan to contact me during business hours. I am often not available and students should not expect to reach me by email after business hours, on weekends, and during holidays.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

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Course Schedule

The schedule is subject to change throughout the semester. Revised syllabi will be posted on the course website.

The Spring 2016 academic calendar can be found at the following address http://www.cuny.edu/academics/calendars/spring-2016.html. Please refer to it for information regarding withdrawal dates.

Class Schedule				
	Date	**Topic**	**Reading Assignments**	**Written Assignments**
Week 1	2/3/16	**F2F Class** Introduction & overview	Read the materials in the "Reading Assignment" folder on BlackBoard (BB) for	Visit the course site Complete Homework Assignment (HM) #1: Research Survey

			Week 1.	
Week 2	2/10/16	F2F Class-- Search Techniques, Coding and Use of LawAtlas	Read the materials in the "Reading Assignment" folder on BB for Week 2.	Complete HM#2.
Week 3	2/17/16	**F2F Class:** Beyond "all appropriate inquiry": asbestos, mold, radon, lead, USTs, soil vapor intrusion, wetlands & more. Use of transaction screen.	Read the materials in the "Reading Assignment" folder on BB for Week 3.	Complete HM#3. **Group Project #1 Due**
Class 4	2/24/16	**Online—Module 2**	Read the materials in the "Reading Assignment" folder on BB for Week 4.	**Group Project #2 Due**
Week 5	3/2/16	**F2F Class** Brownfields Programs	Read the materials in the "Reading Assignment" folder on BB for Week 5.	Complete HM#4. **Group Project #3 Due**
Week 6	3/9/16	**Online Module 3**	Read the materials in the "Reading Assignment" folder on BB for Week 6 & 7.	Complete HM#5. **Group Project #4 Due**
Week 7	3/16/16	**F2F Class** Environmental Compliance Audits: US EPA policy & programs	Read the materials in the "Reading Assignment" folder on BB for Week 7.	Complete HM#6. **Group Project #5 Due**

Week 8	3/23/16	**Online Module 4**	Read the materials in the "Reading Assignment" folder on BB for Week 8.	Complete HM#7. **Group Project #6 Due**
Week 9	3/30/16	**F2F Class** Environmental Compliance Audits: 3rd Party Programs	Read the materials in the "Reading Assignment" folder on BB for Week 9.	**Group Project #7 Due**
Week 10	4/6/16	**Online Module 5**	Read the materials in the "Reading Assignment" folder on BB for Week 10.	**Group Project #8 Due**
Week 11	4/13/16	**F2F Class** **Remediation** **Student Presentations**	Read the materials in the "Reading Assignment" folder on BB for Week 11.	**Group Project #9 (Presentation) Due for Presenting Groups**
Week 12	4/20/16	**Online Module 6**	Read the materials in the "Reading Assignment" folder on BB for Week 12.	**Research Paper Draft Due**
Week 13	4/27/16	**Spring Break**		
Week 14	5/4/16	**FTF** **Discussion of Paper Topics**	Read the materials in the "Reading Assignment" folder on BB for Week 14.	**Peer Review of Paper Due**

Week 15	5/11/16	**FTF** **Exam Review**	Read the materials in the "Reading Assignment" folder on BB for Week 15.	**Final Paper Due** HM#8: Student logs due.
Week 16	5/18/16	Online Exam		**Group Project #10 Due:** Peer & self review forms. HM#9: CUNY SPH student evaluation. HM#10: Class evaluation.

THE CUNY SCHOOL OF PUBLIC HEALTH

Hunter College

Environmental and Occupational Health Sciences

EOHS 770 Biohazards and Emergency Response (Cross listed with MLS 466)

Spring, 2016

Catalogue description

Looking at the course schedule, one can come away with the idea that the course is only concerned with Bioterrorism. All that is used in this type of response situation, comes from technology and work practices that were developed in Industrial Hygiene, Haz-Mat Response and BioSafety over the past 30-40 years.

As will be demonstrated in class, the Industrial Hygiene Paradigm of Anticipation, Recognition, Evaluation and Control lends itself well to Biosafety, and also to the subspecialty of BioTerrorism response. Add to this base the practices and principles used in Biosafety and Microbiology, and you come away with the skills and ability to deal with any situation in a normal research lab setting, or health care facility, or Haz-Waste remediation site.

Industrial Hygiene practices controlling the Source, Pathway and Recipient will be applied in this special setting.

Course meets: Room 232, Brookdale Campus, Thursdays, 6:05-7:50 pm,

e-Mail: **philip.hauck@mssm.edu**

Phone: 212 241 5169 **Office hours: By appointment**

Required books: Biosafety In Microbiology and Biomedical Laboratories

Available at: http://www.cdc.gov/biosafety/publications/bmbl5/index.htm (this is a FREE publication available on line!!-**there is a charge for a printed copy**).

This is also free

http://osp.od.nih.gov/sites/default/files/NIH_Guidelines.html



Recommended **Textbook: You should still have this as an MLS student.**
http://www.us.elsevierhealth.com/isbn/9780323054706/Medical-Microbiology



Medical Microbiology, 6th Edition - *with STUDENT CONSULT Online Access*

By Patrick R. Murray, PhD, Ken S. Rosenthal, PhD and Michael A. Pfaller, MD

960 pages Trim size 8 1/2 X 10 7/8 in
Copyright 2009 Mosby Title ISBN: 978-0-323-05470-6 **$83.95**, Softcover

Computer requirements: Access to Hunter Computers, your own PC or a friend's PC.

Program Competencies
This course will help you to achieve the following competencies

1. Understand the basic principles of Biological Safety
2. Understand the proper use of risks and hazards presented by microbial
3. Know how to use the Industrial Hygiene Paradigm of making interventions at the Source-Pathway-Recipient level of operations.
4. Know how to use safety equipment such as Biological Safety Cabinets and Personal Protective Equipment.
5. Know how to find information available on government websites to create and implement a Biological Safety Program.
6. Orally present findings clearly and effectively.
7. Through a class exercise, learn how to interact as a team using the Incident Command System, using the tools learned in the class to respond to a hypothetical (though realistic) exercise involving a microbial release and health impact.

Course Learning Objectives
After successfully completing this course, you are expected to be able to:

1. Become fluent in the language of Biosafety; able to interpret and apply regulations / guidelines; use guidance manuals, other documents

2. Understand the underlying principles of Biological Safety and where to find source materials such as CDC, NIOSH, ABSA, AIHA, EPA-to name a few

3. Have knowledge of how to survey for biological contamination – limitations of such surveys; how to use the data properly

4. Understand the use / limitations of Engineering Controls

5. Understand the use / limitations of Emergency Response Procedures

6. Understand the selection / use / limitations of Personal Protective Equipment

7. Understand microbial infection process and how to make interventions

8. Understand the similarities / differences between a naturally- occurring outbreak and a bioterrorism / deliberate release act

9. Know how to address a problem through all of the items above using the Incident Command System and developing team interactions in order to respond to an incident through an in-class table-top exercise.

10. To have confidence in your ability to do this type of work in the future

Grading System:

Exam 1 and Exam 2; 40 % each - Total Value for Grade - 80%
Class Presentation; - Total Value for Grade - 20%**
P+ 100% (20%) = 20
P 90% (20%) = 18
P- 80 % (20%) = 16
BL 70% (20%) = 14

***Class Presentation:**
The class will be divided into groups of 4 – 6 each. ***Each group*** will be given a card with a scenario. Your group will be responsible for:

a. Identifying agent(s) / hazard(s) contained in the scenario 4pts
b. Identifying agencies / organizations to notify 4pts
c. Developing an incident response plan 4pts
d. What Safety / Health Precautions to institute 4pts
e. What sampling method(s) to use to identify the hazard 4pts

This is a collaborative effort that gives you an opportunity to work on a simulated real -world problem, using the tools that you are acquiring through the course. *Be Creative* in your presentations — if you want to role play, act-out etc…do it- what ever gets the job done is fine. Just make sure you cover all of the five points above.

You will be "prodded" at certain points to ensure that you are making the right progress, through questions or prompts in class. If you are having difficulty, talk to me and I will make careful recommendations that will lead you on the right track- I will not do your presentation for you.

The assignment is to be enjoyable as well as educational. The other groups not presenting will constitute a "Town Hall forum"- you will have to impress them!! They will ask questions about your presentation….and if they do not….*I will.*

Warning* - all students will be expected to participate in both the presentation and the "Town-Hall" phase….*early presenters will be penalized* if they do not participate (i.e. absent themselves) in the second series of presentations. *Fair is fair*…you wanted an audience to be there for your presentation!!! *Return the courtesy to your classmates.

Assessment
Your understanding of the course material will be evaluated through examinations, research reports, homework assignments, in-class computer exercises, class participation, and class attendance.

Course policies

Grad School
Letter grade ranges are:

97.5-100%	A+
92.5-97.4%	A
90.0-92.4%	A-
87.5-89.9%	B+
82.5-87.4%	B
80.0-82.4%	B-
77.5-79.9%	**C+**
70.0-77.4%	**C**
<70.0%	**F**

Other course policies and formats

- Attendance will be taken and is mandatory.
- Cell Phones, I-pods are to be shut –off (unless you participate in emergency response- excuse yourself and take your call outside of class
- No private discussions or loud talking in class-it disrupts your classmates –If I can hear it…they can too.
- **During the class, do not do any email work or website browsing unrelated to the class.**
- You must sign up for Blackboard 8 so that you can receive course updates and obtain lecture notes and other handouts (For instructions on registering for and using Blackboard, go to: http://bb.hunter.cuny.edu).
- Power Point lecture notes will be available for downloading from Blackboard by the start of each class. (4 slides per page are recommended for printing.)
- Emergency communications and periodic updates about the class will be sent via Hunter email. Forward your Hunter email to your most frequently checked email address so that you can receive important communications. It is your responsibility to ensure that you receive all e-mails regarding the class that are sent to your Hunter e-mail address, so please check it occasionally to be sure that it is functioning properly.
- Instructors are available during office hours and by appointment to assist students with course material, exercises, and exam preparation throughout the semester. Students are encouraged to let the instructor know their office-hour visit plans in advance, in order to avoid overlapped visits.

Institutional policies (provide website link)

Accessibility

In compliance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, the Hunter College Office for Access and Accommodations ensures the availability of accommodations and supporting services for all students with documented disabilities. Those eligible include students with mobility, visual and hearing impairments, learning disabilities, psychiatric disorders, or any medical condition that limits one or more of life's basic functions. For Further Information, please contact: The Office for Access and Accommodations, Room 1124 Hunter East, Telephone: (212) 772-4857.

Academic integrity

"Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures." As stated on pp. 17 of the Hunter College 2006-2009 Graduate Catalog, "Any deliberate borrowing of the ideas, terms, statements, or knowledge of others without clear and specific acknowledgement of the source is intellectual theft and is called plagiarism. It is not plagiarism to borrow the ideas, terms and statements, or knowledge of others if the source is clearly and specifically acknowledge. Students who consult such critical material and wish to include some of the insights, terms or statement encountered must produce full citations in an appropriate form." The CUNY Policy on Academic Integrity is available on pp. 216-217 of the catalogue and online at: http://www.kbcc.cuny.edu/Academic_Integrity_Policy.pdf. The Hunter College Academic Integrity Procedures are summarized at: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-academic-integrity and its full description is available at: http://www.hunter.cuny.edu/senate/assets/Documents/Hunter%20College%20Policy%20on%20Academic%20Integrity.pdf

Course withdrawal

Procedures and rules about course withdrawal are available at: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-course-withdrawal

Last day to drop the course with the grade of "W" is

Help with research and writing

The School of Health Sciences is committed to improving the writing skills of our students. If you feel you need assistance in strengthening your writing skills, take advantage of the materials developed by the Writing Center that are available on their website at http//rwc.hunter.cuny.edu, or sign up for tutoring at the Writing Center (Room 416 Thomas Hunter Hall, 212-650-3937). As a substantial portion of your grade in this course is based on written assignments, you are advised to take advantage of Hunter's writing assistance services early in the semester.

The Hunter College reading/writing center has a wealth of helpful material about how to write outlines and papers. You should access and use this material throughout this course.
http://rwc.hunter.cuny.edu/

Grade of incomplete

Only documented legitimate reasons will be accepted for a student's failure to submit work by the date it is due. There is no absolute right to a grade of incomplete (IN). Only students averaging B or above in this course are eligible to request an incomplete course grade. Granting incompletes to eligible students is at the discretion of the instructor. These grades can be assigned for incomplete presentations, homework, laboratory assignments, class projects, papers, and examinations.

"These steps must be taken as soon as possible and no later than the end of the second week of the following semester. The student shall then be given the opportunity to complete the course without penalty beyond previous established penalties for lateness. The length of time permitted for completing missing coursework remains at the discretion of the instructor and shall be indicated in writing to the student, but shall not extend beyond the end of the semester following the one in which the course was taken. Unless the student submits the work by the date specified by the instructor, the grade will automatically become FIN on the student's permanent record. (Under certain circumstances, where the student must repeat class sessions in a course not given during the following semester, the FIN grade may later be converted to the appropriate letter grade.)" Graduate students have one academic year in which to submit the missing work otherwise the IN grade is permanent on the college transcript. Incompletes should be limited to legitimate and documented emergencies. See the Hunter College 2006-2009 Graduate Catalog (pp.16-17) for more information.

See also:
http://www.hunter.cuny.edu/studentservices/advising/grades-sub/grades-incomplete-grades

Grade appeals

When a student considers a final course grade unsatisfactory, the student can appeal the grade in a progressive order to the instructor, the school director, and the Hunter College Senate. In 1985, grade appeals procedures were adopted by the college. Consult the Hunter College 2006-2009 Graduate Catalog (p. 17) for the time frame and other information regarding the appeals process.

See also:
http://www.hunter.cuny.edu/provost/repository/files/COLLEGE-WIDE%20GRADE%20APPEALS%20PROCEDURES%205-4-05.pdf/view

Attendance and Coursework:

You are a college student at Hunter College, and therefore are expected to attend ***every*** class, participate in class activities and hand in your assignments on time. There are times and occasions where this is not possible -Talk to me so that other

arrangements can be made ahead of time. People do get ill or have conflicts with work / school. I am flexible .once or twice .not every week!!

I do not have an office on campus, however, if you need to see me or are having problems with course i.e. some of the material doesn't make sense, DO NOT wait until May 20th to talk to me about it. I am available to help.

INCOMPLETE Policy

You are expected to complete your coursework on time. Incompletes are NOT an option!! Only in the rarest, most extreme, dire cases and only if approved by the MLS or EOHS Directors, respectively, will an incomplete be considered as an option.

If you are having trouble in the course, do not wait until the last day to discuss it with me. Once the grades are in, it is very difficult to make adjustments. I can schedule meeting times for you (I do not have an Office on the Hunter Campus).

EOHS 770 Biohazards and Emergency Response (Cross listed with MLS 466)
Spring, 2016

Week	Thurs	From: 6:05 To: 7: 50 Rm: W232 Brookdale Campus 2016 Schedule
1	4 Feb	The CDC's Biosafety Levels 1- 3
2	11 Feb	Biological Agents as members of the Microbial World (overview)
*******	****	Start thinking about forming your groups (6 -7 groups of 6-7 students)
3	18 Feb	Sampling Methods and Evaluation of Samples
4*	25 Feb	Microbial Remediation Methods-Setting up Barrier/Containment Facilities and Decon Methods
5	3 Mar	Controlling Microbial Hazards in the Field and in the Laboratory - (RG's and BSL's 1-4)
6	10 Mar	PPE for the Responder- Everything except Respirators
7	17 Mar	Exam 1 – (One Hour) Then PPE for the Responder- Respirators, selection, fit-testing, OSHA 29 CFR 1910.134; CP**Assignment
8	24 Mar	Biology of Microbial Agents and Toxins
9	31 Mar	Mechanisms of Infection; Anti-Microbial Drugs, Vaccines
10	7 Apr	Biological Risk Assessments- or "How to Handicap a Hazard"
11	14 Apr	Emergency Management Procedures; Incident Command System; FRP
12**	21 Apr	Anatomy of an Incident -The Dalles Incident; Contrast to other incidents
13	28 Apr	Spring Recess (Yeah….No Mr. Hauck for a week!!)
14	5 May	Exam 2 – (One Hour) / work on presentations
15	12 May	Class Presentations
16	19 May	Reading Day
17	26 May	Class Presentations

* Monte- Carlo Night One - You get to pick your project assignments
** Monte - Carlo Night Two – You get to pick your presentation order

Questions Comments, Complaints:

Philip G. Hauck
philip.hauck@mssm.edu
(I look at this everyday)

212 241 5169 (work)
646 872 3248 (BlackBerry)

EOHS 770 Biohazards and Emergency Response (Cross listed with MLS 466)
Spring, 2016

Reading Assignments Biohazards and Emergency Response P. Hauck

Session	Title	MM-5	MM-6	Other Sources
Session 1	Biosafety Levels	None	None	BMBL 5th Section IV
Session 2	Microbial world	**2,**3,**6**,(7,8)	**2,4,5,**	None
Session 3	Sampling and Evaluation Chapter J (NIOSH) Handout	**4**,16,17,18	**14,15,** 16,17	
Session 4	Microbial Remediation Methods	**10**	**8**	NYC Asbestos and US Haz-Waste Guide
Session 5	Controlling Microbial hazards	None	None	BMBL 5th Edition
Session 6	Personal Protective Equipment (Suits,gloves)	None	None	MSSM Guide www.osha.gov
Session 7	Personal Protective Equipment (Respirators)	None	None	29 CFR.1910.134
Session 8	Biology of Microbial Agents	**4**,9	--	BMBL Section VIII
Session 9	Mechanisms of Infection	19,20,21,49,50, 51,**48, 68**	**18**,19,**20**,**48,49** 47,67,68,70,77	None
Session 10	Gov't. Roles in Emerg. Resp. National Response Plan	None	None	
Session 11	Emergency Management	None	None	
Session 12	Anatomy of an Incident **Handout: Saffron Swami**	39	18	
Session 13	Presentations			
Session 14	Presentations			

EOHS 770 Biohazards and Emergency Response (Cross listed with MLS 466)
Spring, 2016

Reading Assignments Biohazards and Emergency Response P. Hauck

You are welcomed to read as much as you want (or need) to help you understand the class material—**but, you will only be responsible for the class notes and sections specifically designated by the instructor**. Many of the Other Sources material are given to you to aid you in developing your class presentations and to retain for future reference in your professional development. Sources **like Chapter J (NIOSH)** have material that is not found in general textbooks, as these are professional guidance materials to governmental and private sector practitioners of Industrial Hygiene.

It is important for you to know what federal agencies and guidance materials they have to assist you in your practice, just as much as what is in the textbooks, and how to apply it. There are many "free sources" on the government web sites imbedded in the lecture material.

Books-Required: (They are Free!!!)

Biosafety in Microbiological and Biomedical Laboratories (BMBL-5th) is an invaluable reference to MLS folks as well as the EOHS folks. It should be used as a main reference in your class presentations. It is FREE on line at www.cdc.gov/biosafety You also have to read the assigned sections.

NIH Guidelines for rDNA: A good source of information on recombinant DNA research http://osp.od.nih.gov/sites/default/files/NIH_Guidelines.html

Books- *NOT*Required: (They are *NOT* Free!!!)

Medical Microbiology, Patrick Murray *et.al:* I have given you chapter sections for both the 5th Edition **(MM-5)** and 6th Edition **(MM-6**). You do not have to read any / all of the material, unless you are bogging down. Those Chapters bolded, are very good summaries and supplement class material- spend the time to look these over if you can

p.hauck 2016

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

EPI 75000 Epi Methods I:Study Design
3 Credits
Spring 2016

Time and location	Silberman, 322 (and C05), Wed 6:05-7:50
Instructor	Professor C Mary Schooling PhD Email: mschooli@hunter.cuny.edu Phone: 212 396 7753
Office hours	Wednesdays 4:00pm – 6:00pm, by appointment or walk-in Silberman 545
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course will provide an in depth understanding of the design and conduct of epidemiological studies, including causal inferences, measurement, major study designs and threats to validity.
Course prerequisites	PH 750/751 & PH 752/53
Course format	Lecture/seminar
Required reading and resources	Aschengrau A & Seage GR. *Essentials of Epidemiology in Public Health*, 2nd edition, Jones and Bartlett publishers, 2008 And reading on blackboard, see schedule
Suggested reading and resources	Susser E, Schwartz S, Morabia A, & Bromet EJ. Psychiatric Epidemiology, 1st edition, Oxford University Press, 2006

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Epidemiology-track Competencies		
1. Identify key sources of data for epidemiologic purposes 2. Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	1. Describe the design of major US surveys (NHANES) and explain how this affects analysis of the survey 2. Distinguish between incidence and prevalence 3. Explain the relation between different measures of association 4. Compare the interpretation of absolute and relative risk 5. Test hypotheses regarding associations of health with environmental, demographic, social and economic factors.	Worksheet 1 Worksheet 1 Worksheet 2 Worksheet 2 Midterm and Final
3. Critically read and evaluate the strengths and limitations of epidemiologic literature from a methodologic perspective	1. Evaluate the relevance of the Bradford Hill criteria to the scientific method 2. Compare the role of causal factors and predictors in public health 3. Explain the scientific process and the role of refutation in epidemiology	Worksheet 3 Worksheet 1 Worksheet 1
4. Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	1. Draw a directed acyclic graph for a research question using an RCT, a cohort study and a case-control study 2. Compare the biases generated by selection bias and confounders 3. Describe the uses of instrumental variable analysis in public health 4. Explain the “Table 2” problem	Worksheet 4 Worksheet 4 Worksheet 5 Worksheet 5

	5. Compare inferences that can be made from a cohort study and an RCT 6. Compare and contrast different types of case-control studies, and the measures they generate 7. Compare different methods for identifying confounders 8. Evaluate a study against the relevant checklist 9. Explain additive and multiplicative effect modification 10. Explain mediation 11. Evaluate a screening test 12. Calculate NPV, PPV and explain their determinants 13. Identify and communicate the limitations of specific research projects 14. Explain why most research findings are false	Worksheet 5 Worksheet 7 Worksheet 8 Worksheet 9 Worksheet 12 Worksheet 13 Worksheet 14 Paper
5. Identify key threats to validity (internal and external) within and across epidemiologic studies	1. Explain how to assess internal and external validity 2. Identify and communicate the limitations of specific research projects	Worksheet 9 Worksheet 9
6. Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	1. Implement descriptive and analytic analyses in SAS 2. Select appropriate statistical methods for the data type and the research question	Computer assignments Midterm and Final

Course Assessments

The course will be assessed based on a written assignment, 3 computer assignments, 12 worksheets, a midterm and a final.

Grading

Evaluation criteria

Written Assignment:
Paper: Students are asked to write a position paper discussing the levels of evidence needed for policy. Specifically: What level of evidence do you need for policy? Your paper should include a discussion about what we mean by a cause in epidemiology (definition), how we conceptualize causes and try to identify them in epidemiology, with specific reference to the thinking behind the RCT, cohort and case control study designs, and the limitations of epidemiology in identifying causes? The purpose of the position paper is to help students organize their thoughts on a topic of importance in epidemiology and develop an informed argument to support their ideas. The paper should begin with a clear statement of the student's position, or thesis, followed by a structured argument supporting that thesis, describing and discussing the limitations of the counter-arguments. The paper should be no more than 5 pages long, single spaced, 12-point font with 1 inch margins. Please ensure all statements of fact are referenced.

Grading rubrics for the written assignment

(A+ to A-)	(B+ to B-)	(C+ to C)	(F)
Provides a comprehensive synthesis of the topic with appropriate examples and discussion of the implications for practice	Identifies the implications of the key points in the topic, provides some examples and relevance to practise	Describes the main concepts in the topic	Inability to identify and describe the main concepts

Students are to complete 3 computer assignments, these are computer exercises.

Students are to complete 12 worksheets of mainly short answer questions about the topics covered in the lectures.

Midterm Exam: Students will have a take home midterm exam to complete in 1 week, consisting of short answer questions about topics covered during class lectures and in readings. Students must work independently and not discuss the exam with classmates.

Final Exam: The final exam will be a take-home computer assignment involving statistical analysis in SPSS of an analytic question, and students are expected to analyze the provided data, interpret findings in the context of the literature, and draw conclusions. The exam must be completed independently and students may not discuss the exam with classmates. Students will be given the questions 1 week before the exam is due.

The relative weight of each course component is as follows:

Assessment	Weight
Written Assignment	20%
Computer Assignments	20%
Worksheets	24%
final	20%
Midterm	16%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an “unofficial withdrawal” (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
Attendance is mandatory and class participation may generate extra credit.

Late/incomplete submission of assignments
Late or incomplete assignments will be accepted at the discretion of the instructor.

Make-ups, rewrites, and extra credit
Make-ups and not available, but rewrites are allowed.

Expectations of students
- You must sign up for Blackboard so that you can receive course readings, updates and obtain lecture notes and other handouts. For instructions on registering for a portal account in order to access Blackboard, go to: https://portal.cuny.edu/portal/site/cuny/index.jsp?epi-content=LOGIN.
- Please forward your CUNY e-mail to your most frequently checked e-mail address. Check your e-mail regularly so that you can receive emergency communications and periodic updates about the class.
- You are expected to complete readings and written assignments prior to class.
- Any written assignments should be uploaded to blackboard by 4pm on the day of the class.
- Students are expected to participate in class discussions, treating their classmates and the instructor with respect.
- Statistical analysis will be conducting using SAS. Students should be aware that they can bring their laptop computers to the CUNY School of Public Health library and get SAS software loaded for their home use. SAS has an excellent help menu and that there is a large amount of SAS code available online easily accessible through Google.

Expectations for the instructor
- Power Point lecture slides will be available for download on Blackboard after class.
- The instructor is available during office hours and by appointment to assist students with assignments, course material, and exam preparation. The preferred method of communication with the instructor is e-mail.
- Grades for each piece of work will be uploaded to blackboard within a week.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester.

Please refer to the current academic calendar for important dates (for example: holidays, course drop, course withdrawal). http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%2010-19-20151.pdf.

Course schedule

Session	Date	Topic	Reading	
1	3feb16	Introduction and review	None	
2	10feb16	Review measures of effect and data analysis	Assigned Readings: 1. Aschengrau text Ch. 2 & 3. 2. Northridge ME. Annotation: public health methods—Attributable risk as a link between causality and public health action. *American Journal of Public Health* 1995; 85:1202-1204. 3. Morabia A. The Essential Tension Between Absolute and Relative Causality *American Journal of Public Health* 2001; 91(3): 335-336 4. Davies HT, Crombie IK, Tavakoli M. When can odds ratios mislead? British Medical Journal 1998; 316: 989-991. Recommended readings: 1. Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA* 1998; 280: 1690-1691. 2. Schwartz LM, Woloshin S, Dvorin EL, Welch HG. Ratio measures in leading medical journals: structured review of accessibility of underlying absolute risks. BMJ 2006; 333(7581):1248.	Worksheet 1
3	17feb16	Causal inference in epidemiology 1	Assigned Readings: 1. Aschengrau text Ch.15. 2. Susser text pp. 33-52. 3. Benson K. Hartz AJ. A comparison of observational studies and randomized, controlled trials. *New England Journal of Medicine 2000*; 342(25):1878-1886. 4. Prasad V, Jorgenson J, Ioannidis JP, Cifu A.J Observational studies often make clinical practice recommendations: an empirical evaluation of authors' attitudes.J Clin Epidemiol. 2013 Apr;66(4):361-366. 5. M Parascandola, D L Weed. (2001) Causation in epidemiology. *J Epidemiol Community Health* 2001;55:905–912. 6. Hill AB. The environment and disease: Association or Causation? *Proceedings of the Royal Society of Medicine* 1965; 295-300. 7. Kreiger N. Epidemiology and the Web of Causation: Has anyone seen the spider? *Social Science and Medicine* 1994; 39:887-903. Recommended reading	Worksheet 2

			1. Taubes G. Epidemiology faces its limits. *Science* 1995; 269(5221):164-169 2. J Pearl. Introduction to Causal Inference. Int J Biostats 2010; 6: 1-11.	
4	24feb16	Directed acyclic graphs	Assigned Readings Greenland S, Pearl J, Robins, JM. Causal Diagrams for Epidemiologic Research. (1999) Epidemiology; 10(1): 37-48. Assigned Readings: 1. Iwashyna TJ, Kennedy EH, Instrumental variable analyses. Exploiting natural randomness to understand causal mechanisms. *Ann Am Thorac Soc*. 2013 Jun;10(3):255-60. 2. O'Keeffe AG, Geneletti S, Baio G, Sharples LD, Nazareth I, Petersen I.Regression discontinuity designs: an approach to the evaluation of treatment efficacy in primary care using observational data. *BMJ*. 2014 Sep 8;349:g5293. doi: 10.1136/bmj.g5293. 3. Keene D, Price C, Shun-Shin MJ, Francis DP, Effect on cardiovascular risk of high density lipoprotein targeted drug treatments niacin, fibrates, and CETP inhibitors: meta-analysis of randomised controlled trials including 117,411 patients. *BMJ*. 2014 Jul 18;349:g4379. doi: 10.1136/bmj.g4379. 4. Haase CL, Tybjærg-Hansen A, Qayyum AA, Schou J, Nordestgaard BG, Frikke-Schmidt R.,LCAT, HDL cholesterol and ischemic cardiovascular disease: a Mendelian randomization study of HDL cholesterol in 54,500 individuals. *J Clin Endocrinol Metab*. 2012 Feb;97(2):E248-56. 5. Simonsen L, Viboud C, Taylor RJ, Miller MA, Jackson L, Influenza vaccination and mortality benefits: new insights, new opportunities. *Vaccine*. 2009 Oct 23;27(45):6300-4. doi: 10.1016/j.vaccine.2009.07.008. 6. Westreich D, Greenland S. The table 2 fallacy: presenting and interpreting confounder and modifier coefficients. *Am J Epidemiol*. 2013 Feb 15;177(4):292-8.	Worksheet 3 Computer assignment 1
5	2mar16	Longitudinal studies 1	Assigned Readings: 1) Aschengrau text Ch. 6, 7 & 8 2) Susser text pp. 129-137. 3) Hernan MA. A definition of the causal effect for epidemiologic research. *J Epidemiol and Community Health* 2004; 58: 265-271. 4) Writing group for the Women's Health Initiative Investigators. Risk and benefits of estrogen plus progestin in healthy postmenopausal women. *JAMA* 2002; 288:321-333. 5) Pedersen AT, Ottesen B. Issues to debate on the Women's Health Initiative (WHI) study. Epidemiology or randomized clinical trials--time out for hormone replacement therapy studies? *Human Reproduction* 2003; 18(11):2241-2244. 6) Petitti D, Commentary: hormone replacement therapy and coronary heart	Worksheet 4

			disease: four lessons. *Int J Epidemiol.* 2004 Jun;33(3):461-3.. 7) Smith GD, Lawlor DA, Harbord R, Timpson N, Day I, Ebrahim S. Clustered environments and randomized genes: a fundamental distinction between conventional and genetic epidemiology. *PLoS Med.* 2007 Dec;4(12):e352. 8) Vandenbroucke JP, von Elm E, Altman DG, Gøtzsche PC, Mulrow CD, Pocock SJ, Poole C, Schlesselman JJ, Egger M; STROBE Initiative. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. *Epidemiology*. 2007 Nov;18(6):805-35. 9) Berkman LF. Seeing the forest and the trees – from observation to experiments in social epidemiology. *Epidemiologic reviews* 2004; 26(2): 2-6. 10) Lipsitch M, Tchetgen E, Cohen T. Negative controls: a tool for detecting confounding and bias in observational studies. *Epidemiology* 2000: (3): 383-8. 11) Suissa S, Azoulay L. Metformin and the risk of cancer: time-related biases in observational studies. *Diabetes Care.* 2012 Dec;35(12):2665-73. 12) Patel CJ, Ioannidis JP. Placing epidemiological results in the context of multiplicity and typical correlations of exposures. *J Epidemiol Community Health*. 2014 Nov;68(11):1096-100.	
6	9mar16	Exercises	No reading	Worksheet 5
7	16mar16	Midterm		
8	30mar16	Case-control studies 1	Assigned Readings: 1) Aschengrau text Ch. 9. 2) Susser text pp. 212-225. 3) Morabia A. Case control studies in clinical research: Mechanisms and prevention of selection bias. *Preventive Medicine 1997*; 26:674-677. 4) Bloom MS, Schisterman EF, Hediger ML. Selecting controls is not selecting "normals": design and analysis issues for studying etiology of polycystic ovary syndrome. Fertility & Sterility 2006; 86: 1-12. 5) Susser ES, Schaefer CA, Brown AS, Begg MD, Wyatt RJ. The design of the prenatal determinants of schizophrenia study. *Schizophrenia Bulletin 2000*; 26:257-273. 6) Brown AS, Begg MD, Gravenstein S, Schaefer CA, Wyatt RJ, Bresnahan M, Babulas VP, Susser ES. Serologic evidence of prenatal influenza in the etiology of schizophrenia. *Archives of General Psychiatry 2004*; 61(8):774-780.	Computer Assignment 2
9	6apr2016	Case-control studies 2	Use the previous weeks	Worksheet 7
10	13apr2016	Ecological and meta-analysis	Assigned Readings: 1) Aschengrau text Ch. 6 2) Rose, G. Sick individuals and sick populations. Int J Epidemiology 2001; 30: 427-432.	Worksheet 8

			3) Pearce N. The ecological fallacy strikes back. *J Epidemiol Community Health* 2000;54:326–327. 4) Schwartz, S. The fallacy of the ecological fallacy: the potential misuse of a concept and the consequences. American Journal of Public Health 1994; 84(5): 819-824. 5) Rosenthal R and DiMatteo MR. META-ANALYSIS: Recent Developments in Quantitative Methods for Literature Reviews. Annu. Rev. Psychol. 2001. 52:59–82. 6) http://prisma-statement.org/ 7) Stroup DF, Berlin JA, Morton SC, Olkin I, Williamson GD, Rennie D, Moher D, Becker BJ, Sipe TA, Thacker SB., Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group.*JAMA.* 2000 Apr 19;283(15):2008-12. 8) Gøtzsche PC, Ioannidis JP. Content area experts as authors: helpful or harmful for systematic reviews and meta-analyses? *BMJ*. 2012 Nov 1;345:e7031	
11	20apr2016	Internal validity	Assigned Readings: 1) Aschengrau text Ch. 10, 11 & 12. 2) Susser text pp. 138-150. 3) Copeland KT, Checkoway H, McMichael AJ & Holbrook RH. Bias due to misclassification in the estimation of relative risk. *American Journal of Epidemiology* 1977, 105(5): 488-495. 4) Christenfeld JS, Sloan RP, Carroll D & Greenland S. Risk factors, confounding, and the illusion of statistical control. *Psychosometric Medicine* 2004, 66: 868-875. 5) Brenner H & Blettner M. Controlling for continuous confounders in epidemiologic research. *Epidemiology* 1997, 8(4): 429-434. 6) Pearce N, Checkoway H, Kriebel D Bias in occupational epidemiology studies. *Occup Environ Med*. 2007 Aug;64(8):562-8.. 7) Schwartz S, Campbell UB, Gatto NM, Gordon K. Toward a clarification of the taxonomy of "bias" in epidemiology textbooks. *Epidemiology*. 2015 Mar;26(2):216-22.	Worksheet 9 Computer assignment 3
12	4may2016	External validity /Effect modification	Assigned readings: 1) Aschengrau text Ch. 13 2) Susser text pp. 319-328. 3) Sun X, Ioannidis JP, Agoritsas T, Alba AC, Guyatt G. How to use a subgroup analysis: users' guide to the medical literature. JAMA. 2014 Jan 22-29;311(4):405-11. 4) Ioannidis JP, Greenland S, Hlatky MA, Khoury MJ, Macleod MR, Moher D, Schulz KF, Tibshirani R. Increasing value and reducing waste in research design, conduct, and analysis. Lancet. 2014 Jan 11;383(9912):166-75.	Worksheet 11
13	11may2016	Measurement & Mediation	Assigned Readings: 1) Aschengrau text Ch. 15.	Worksheet 12

			2) Rothman KJ. (1995) Causes. American Journal of Epidemiology, 141(2): 90-95. 3) Hafeman DM, Schwartz S. (2009) Opening the Black Box: a motivation for the assessment of mediation. *International Journal of Epidemiology*, 38:838–845. 4) VanderWeele TJ, Mediation and mechanism. *Eur J Epidemiol*. 2009;24(5):217-24.	
14	18may2016	Screening	Assigned Readings: 1) Saquib N, Saquib J, Ioannidis JP., Does screening for disease save lives in asymptomatic adults? Systematic review of meta-analyses and randomized trials. *Int J Epidemiol*. 2015 Jan 15. 2) Berry DA[1,] Failure of researchers, reviewers, editors, and the media to understand flaws in cancer screening studies: application to an article in Cancer. *Cancer*. 2014 Sep 15;120(18):2784-91.	Worksheet 13 Writing Assignment due
15	25may2016	Final		Final due Worksheet 14

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

EPI 75200 APPLIED RESEARCH: DATA MANAGEMENT AND ANALYSIS

3.0 Credits
Spring 2016

Time and location	Silberman Building (2180 Third Avenue on 119th Street) room C-09 Tuesdays 6:05PM - 7:50PM
Instructor	Associate Professor, Elizabeth Kelvin, PhD, MPH Silberman building (2180 Third Avenue on 119th Street), Room 543 E-mail: ekelvin@hunter.cuny.edu Phone: 212-396-7751 Email is preferred method of communication
Office hours	Tuesdays 4:30-5:45 or by appointment
Course website	Black Board: https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Data management and analysis are essential components of all epidemiologic research studies. Often insufficient thought is put into these tasks with serious consequences to the outcome of the study. Data entered into poorly designed databases may turn out to be entirely unusable, or usable only after extensive cleaning and manipulation that is beyond the ability of many investigators. This problem can be prevented if database management and analysis are kept in mind during all aspects of the study, starting with the design of the data collection instruments. This course will provide an introduction to some of the core concepts of database design, data management, data cleaning and analysis. Via class lectures, student assignments and projects, and discussion, we will consider the best methods for working with data from the initial collection through analysis and interpretation.
Course prerequisites	• EPI 750 & EPI751 or equivalent with a course grade of B or better • BIOS 750 & BIOS751 or equivalent with a course grade of B or better • Experience using SAS software
Course format	Most classes will begin with a lecture, followed by discussion. Some classes are for students to receive help with their data analysis.
Required reading and resources	There is no required text book for this course, but some classes have assigned journal articles, which are posted on black board (BB). For help with SAS programming, goggle is usually very

	helpful, but students may also consider referring to the following suggested textbooks:
Suggested reading and resources	(1) Delwiche, LD & Slaughter, SJ. 2008. The Little SAS Book: A Primer (4th edition) . Cary, NC: SAS Institute, Inc. (2) Cody, RP & Smith, JK. 2005. Applied Statistics and the SAS Programming Language (5th edition). Upper Saddle River, NJ: Prentice Hall.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Identify key sources of data for epidemiologic purposes	• Define a research questions based on a review of the literature. • Conduct a web search to identify publicly available population-based health data to answer research questions • Identify the benefits and limitations of using publicly available data.	Paper & presentation
2. Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	• Construct a data analysis plan for a publicly available dataset that is appropriate given the study design used to collect that data and the research question being addressed. • Apply descriptive and analytic statistics to describe the distribution of health conditions using publicly available data. • Test hypotheses regarding associations of health with environmental, demographic, social and economic factors using publicly available data. • Use confidence intervals and p-values to assess statistical uncertainty using publicly available data. • Write a research paper in which data analysis methods and results are presented.	Paper, presentation & data management assignments
3. Critically read and evaluate the strengths and limitations of epidemiologic	• Discuss epidemiological articles in terms of the strengths and weaknesses of the	Paper & presentation

literature from a methodologic perspective	research design, data collection, analysis and interpretation. • Write a research paper in which the literature is synthesized into a structured argument justifying addressing a specific research question in the introduction and the research results are put into context of the literature in the discussion section.	
4.Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	• Write the methods section of a research paper using publicly available data • Construct a data analysis plan for a publicly available dataset that is appropriate given the study design used to collect that data and the research question being addressed. • Write the limitations section of a research paper.	Paper & presentation
5.Identify key threats to validity (internal and external) within and across epidemiologic studies	• Write the limitations section of a research paper. • Discuss study limitations	paper & presentation
6.Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	• Use database software (EpiInfo) to design a database, enter data, and pull that data into SAS for analysis. • Use SAS to describe epidemiologic data and assess the relationships among variables, including mediation and effect modification.	paper, presentation & data management assignments

Course Assessments

Student project: One important part of this course is a workshop in which students will work through the steps involved in writing a research paper. These steps include formulating and justifying testable hypotheses, cleaning and analyzing publicly available data, and writing a manuscript in publishable format. Specifically, activities include:
(1) Writing a literature review formulated as a structured argument describing what is known about the topic, what is missing in the current literature and how the student's analyses will fill that gap. This section of the paper should be no longer than 3 pages (double spaced, 12pt font, 1 inch margins).
(2) Specifying research questions, which have been justified in the literature review, and stating testable hypotheses to be examined to answer the research questions using a publicly available dataset (research question is usually specified at the end of the literature review section).
(3) Describing the study population and the methods used to collect and analyze the data. This section should be no more than 3 pages (double spaced, 12pt font, 1 inch margins).
(4) Cleaning and analyzing the data using SAS software.
(5) Describing the results of the analyses in tables and text. The results section should be no more than 4 pages (double spaced, 12pt font, 1 inch margins) and the paper should have no more than 4 tables.
(6) Discussing the results in light of the literature, describing the public health implications of the findings, and stating the strengths and weaknesses of the study the student has conducted. This section should be no more than 3 pages (double spaced, 12pt font, 1 inch margins).

Each student will work independently, but students are strongly encouraged to share ideas, syntax, read each other's drafts, and obtain feedback and suggestions from their colleagues both in and outside of the class.

For this project, students may choose one of four publicly available datasets:
1) The New Immigrant Survey, conducted by Princeton University. The study follows a cohort of new permanent residents in the United States, and currently the baseline data (called "NIS-2003-1") and first round of follow-up data (NIS-2003-2) is available for use. The data and documentation (code books, etc.) is available online at: http://nis.princeton.edu. Note that you have easy access to the study documents (questionnaires, data dictionary, etc.) but in order to access the actual data for analysis you will have to register on the website. The data are available in SPSS and SAS.
2) The Global School Based Student Health Survey (GSHS) from the World Health Organization & the Centers for Disease Control and Prevention (CDC). GSHS is a school-based survey conducted in various countries primarily among students aged 13–15 years that aims to provide data on health behaviors and protective factors related to the leading causes of mortality and morbidity among children. The data and documentation (code book, etc.) are available online at: http://www.who.int/chp/gshs/en/. The data are available in SAS (as well as other formats). You should probably focus on one country if using this data.

3) The 2013 Community Health Survey (CHS), conducted by the New York City Department of Health and Mental Hygiene. CHS is a cross sectional telephone survey conducted annually by the NYCDOH. Students interested in using this dataset should use the most up-to-date data (2010). The data and documentation is available online at: http://www.nyc.gov/html/doh/html/data/chs-data.shtml . The data are available in SAS.
4) 2013 NYC Youth Risk Behavior Survey (YBRS). The NYC Youth Risk Behavior Survey (YRBS) is conducted through an ongoing collaboration between the New York City Department of Health and Mental Hygiene (DOHMH), the Department of Education (DOE), and the National Centers for Disease Control and Prevention (CDC). The New York City's YRBS is part of the CDC's National Youth Risk Behavior Surveillance System (YRBSS). The survey has been conducted in odd-numbered years since 1997. The surveys' primary purpose is to monitor priority health risk behaviors that contribute to the leading causes of mortality, morbidity, and social problems among youth in New York City. Students complete a self-administered, anonymous questionnaire that measures a variety of behaviors, including tobacco, alcohol and drug use, unintentional injury and violence, sexual behaviors, dietary behaviors, and physical activity. The data is available online at: http://www.nyc.gov/html/doh/html/data/episrv-yrbsdata.shtml

All four datasets have population weights, which should be used to apply the descriptive statistics and analytic results to the total population rather than just the study sample, and were collected using a complex sampling scheme that needs to be taken into account during analysis. The weighting and sampling scheme can be taken into account in SAS for most statistical tests you would want to run. More complicated analyses might require SUDAAN, which is beyond the scope of this class. Note that it is possible to analyze this type of data in STATA and, if you have the complex sampling module add-on, in SPSS, but for this course we will be using SAS. The websites for the data sets have instructions for how to analyze the data and students should refer to those instructions when planning and conducting their analyses.

Written assignments: The end product of the class project will be a research paper in the format of a publishable manuscript. However, students will work on the sections of the manuscript in steps: (1) Introduction and methods section), (2) full paper draft with edited introduction and methods sections (no more than 15 pages) (3) final paper draft (no more than 15 pages). At each step, students will turn-in (post on discussion board of BB) to their instructor the written documents. Students will also be invited to read each others' work for class discussions during certain classes. Students should be considerate in giving feedback to their colleagues, and can do so either orally or by writing comments on the document and returning it to the author. Sources cited in the paper must be appropriately cited and referenced. Students are REQUIRED to use endnote for their references, and they must paste their data cleaning and statistical analysis syntax (SAS syntax, well organized and labeled) at the end of their paper as an appendix. Endnote is available for students to download to their personal computer (PC or MAC) for free from Hunter: http://library.hunter.cuny.edu/citation-tools. The final paper should be formatted for a specific journal to which the student thinks his/her paper could be submitted (at least theoretically). If the student does not have a

preferred journal, s/he may format for AJPH (http://ajph.aphapublications.org/userimages/ContentEditor/1318438422261/Instructions_for_Authors.pdf). Each draft of the paper turned-in will be assigned a numeric grade by the instructor. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

Data management assignment: In addition to the paper, early in the semester students will complete and turn-in for evaluation a data management assignment. The assignment will be completed and turned-in in three sections: (1) Database creation & data entry: students will create a database in EpiInfo and enter some provided data (free software from the CDC: http://wwwn.cdc.gov/epiinfo/html/downloads.htm. Note EpiInfo cannot be loaded on a Mac). (2) Merging data and formatting: Export the data from EpiInfo and import it into SAS, merge in additional data and write syntax to format and label the data. (3) Data cleaning: Write SAS syntax to run queries to identify problematic data, and correct the data. Students will turn-in (1) their database with the entered data, (2) their formatted data and syntax, and finally (3) their merged and cleaned data with syntax by posting the assignments on BB. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

Class attendance & participation: This class is being taught partly as a seminar and manuscript writing workshop and students will be given time to discuss and work-on their papers during class. Therefore students are expected to attend class in order to participate in discussions and provide comments and suggestions to their fellow students on their work. Students may be absent for up to three classes without having any effect on their grade.

Student presentations: Students will also be required to present their paper at the end of the semester. The presentation should take no more than 8 minutes and include no more than 12 Power Point slides.

Grading

Evaluation criteria

Describe the grading methodology that will be used to assess performance in the class. If a rubric is not used, what method will be used to evaluate graded assignments?

The relative weight of each course component is as follows:

Assessment	**Weight**
Class attendance and participation	5%
Student presentation	5%
Database design & data entry assignment	10%
Dataset Formatting Assignment	10%
Data queries & cleaning assignment	10%
Written Literature Review & Methods Section	15%
Paper draft	15%

Final paper	30%
TOTAL	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

. Students may be absent for up to three classes without having any effect on their grade.

Late/incomplete submission of assignments

- Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).
- Students who miss their scheduled presentation will receive a grade of zero which will be averaged into their course grade.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit assignments. This is an advanced graduate level course and as such it is assumed that students are able to manage their time and complete assignments at the high level expected for such a course.

Expectations of students

- This is the final epidemiology/biostatistics methods course in the MPH series. It is assumed that by this point students feel relatively comfortable writing research-style papers and conducting statistical analysis using SAS. Students should be aware that they can bring their laptop computers to the CUNY School of Public Health library and get SAS software loaded for their home use. SAS has an excellent help menu and that there is a large amount of SAS code available online easily accessible through Google. In addition, the NYCDOH website provides sample SAS code for analyzing data collected using their complex sampling methods. Students should not expect to be given all the SAS code they will need to analyze the data for their papers and should plan to spend time searching for examples of the code they need.
- There are three software packages you will need to have access to in this class: (1) EpiInfo, which can be downloaded to your PC for free from the CDC website but which does not work on Macs (2) Endnote, which can be downloaded to your PC or Mac for free from Hunter's website, and (3) SAS, which is available to load on student's personal laptops from the library. Students should plan on loading Endnote, EpiInfo and SAS and become comfortable with their features early in the semester so that they are ready to use the software when required for an assignment. The software for this course will also be available for student use at the following locations (1) on the laptop computers in the library in the Silberman building should have SAS, EpiInfo and Endnote (2) the computer labs at 68th Street should have SAS and Endnote, may have EpiInfo (hours can be found at this link: http://www.hunter.cuny.edu/it/it-services/computer-labs-alias). Most students will likely have to schedule time to come to the Silberman building or some other computer lab to complete the class assignments. Students should keep this in mind when deciding when to take this class and in planning their schedules throughout the semester. Not having access to software is not a valid excuse for turning-in an assignment that is incomplete (e.g. does not have citations in endnote) or late.
- In this class you will be working with real data. Therefore, if you put thought and effort into the project and have a little luck you may finish the class with a paper that

is worth publishing or presenting at a public health conference. Of course, luck is something you cannot control and there are no guarantees, but previous classes have been very successful. In 2011, for example, two students won BEST POSTER awards at the Hunter College Student Research Day for the analyses they conducted as part of this class. In addition, three students have presented their work form this class at professional conferences, and four papers have been published in journals with high impact factors. A couple of additional papers are being edited for journal submission.

- If a student will not be able to attend a class, assignments due on that day should be e-mailed to the instructor or, when appropriate, posted on BB before the class begins (e.g. before 6:05pm the day of the class) to receive full credit. The instructor will reply when a document is received via e-mail. If a reply is not received by the student he/she should contact the instructor to be sure that the assignment was sent correctly. Students should keep their sent e-mail to demonstrate that the assignment was turned-in and when, in the event that the instructor has a questions about this. Late assignments will receive a penalty in the form of a grade reduction (see below for specifics).
  - Students must turn in their own, independently written assignments and papers. However, students are encouraged to work collaboratively on data analysis and paper editing. Students working with similar variables should collaborate by sharing variable definitions or data analysis syntax. When one or more student has provided a large amount of help to another student in any aspect of the final paper (hypothesis conceptualization, data analysis, paper editing, etc.), that help should be acknowledged by including an acknowledgement statement at the end of the final paper that is turned in. Such collaboration might also warrant co-authorship should the paper be submitted for publication.
- **Resources for help:** Hunter college has a writing center that can provide guidance for paper writing (website for information: http://rwc.hunter.cuny.edu/). Students are encouraged to use this and other resources in preparing their written assignments. Students should also feel free to discuss their papers with each other and to seek assistance from others in editing their papers, refining their hypotheses and clarifying their argument. However, the final paper or assignment that is turned in must be written by the student him or herself. Others may NOT contribute to the paper or assignment by writing portions of it.

Expectations for the instructor

- Power Point lecture slides will be available for download on Blackboard prior to class.
- Students can expect the instructor to start and end class on-time and give feedback on assignments in a constructive way.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's

basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Note that the schedule is subject to change throughout the semester.

EPI752 Course Schedule		
Date of class	**Topic**	**Assignment due (should be completed prior to class)**
February 02, 2016	1. Introduction: what is data management?	
Feb 9, 2016 follows a Friday Schedule		
February 16, 2016	2. Database design, software & data entry	Readings: Pinol 1998, Linger 1998 **Assignment Due**: Post on BB which dataset you will use for your paper, what outcomes and exposures you want to look at. Describe how these variables are coded, their frequency (unweighted) and what recode, if any, you might make (you can change your plan later)
February 23, 2016	3. Writing a research paper introduction	Readings: Marquez 2006
March 01, 2016	4. Data management (formatting, queries, cleaning, merging, etc.); organizing your syntax	**Assignment Due:** Data Management 1: Creating a database & data entry (post database on BB)
March 08, 2016	5. Writing a methods section: study population, study design, data collection procedures, variable definition & data analysis plan	**Readings:** Montgomery 2013 **Assignment Due**: Post on BB your initial bibliography for your paper with at least 25 papers cited using endnote.
March 15, 2016	6. Data analysis review & advanced topics (regression options, sampling weights, complex sampling designs, merging complex data across time or populations)	**Readings**: Sakshaug 2014 & Martin **Assignment Due:** Data Management 2: Pulling data into SAS, merging & formatting (post syntax & data on BB)
March 22, 2016	7. Presenting your analytic results (tables & text)	Readings: LeVasseur 2013, Mantell 2011 **Assignment Due:** Data Management 3: Queries & cleaning (post syntax and cleaned data on BB)
March 29, 2016	8. Class time for data analysis problem solving	**Assignment Due:** Paper introduction & Methods Sections
April 05, 2016	9. Class time for data analysis problem solving	

EPI752 Course Schedule		
Date of class	**Topic**	**Assignment due (should be completed prior to class)**
April 12, 2016	10. Writing a discussion section, sensitivity analysis & pulling the whole paper together Additional time for data analysis problem solving	Readings: Kelvin 2012
April 19, 2016	11. Missing Data & Multiple Imputation	**Assignment Due:** Complete paper draft 1 with edited paper introduction & methods sections as well as results (tables & text) & discussion section
April 22-30, 2016 Spring Recess		
May 03, 2016	12. Student Presentations	
May 10, 2016	13. Student presentations	
May 17, 2016	14. Final student presentations Lecture on Presenting & publishing your research	
May 24, 2016	**15. No class meeting**	**Final Paper Due**

Assigned readings:

Class 2: February 16, 2016

(1) Pinol A, Bergel E, Chaisiri K, Diaz E and Gandeh M. Managing data for a randomised controlled clinical trial: experience from the WHO antenatal care trial. Paediatric and Perinatal Epidemiology 1998, 12, Suppl. 2: 142-155.

(2) Linger H, Burstein F, Zaslavsky A, Aitken C, Crofts N. Conceptual development of an information systems framework for improving continuity in epidemiological research. European Journal of Epidemiology 1998, 14(6): 587-593.

Class 3: February 23, 2016

(1) Marquez DX and McAuley E. Social cognitive correlates of leisure time physical activity among Latinos. Journal of Behavioral Medicine 2006, 29(3): 281-289.

Class 5: March 08, 2016

(1) Montgomery MA, Jackson CT, Kelvin EA. Premigration Harm and Depression: Findings from the New Immigrant Survey, 2003. Journal of Immigrant and Minority Health, DOI 10.1007/s10903-013-9810-z, 2013.

Class 6: March 15, 2016

(1) Sakshaug JW & West BT. Important considerations when analyzing health survey data collected using a complex sample design. American Journal of Public Health 2014, 104(1): 15-16.
(2) Martin K. Analyzing Data from Complex Samples Using PROC SURVEYFREQ in SAS® 9.2. Available at: http://www.wuss.org/proceedings10/HOC/Analyzing%20Data%20from%20Complex%20Samples%20Using%20PROC%20SURVEYFREQ%20in%20SAS%C2%AE%209.2.pdf.

Class 7: March 22, 2016
(1) LeVasseur MT, Kelvin EA, Grosskopf NA. The Modifying Effect of Intersecting Identities on the Association Between Bullying and Suicide Attempt among New York City Youth: Results from the 2009 New York City Youth Risk Behavior Survey. American Journal of Public Health, 103(6):1082-9.
(2) Mantell JE, Kelvin EA, Sun X, Zhou JF, Exner TM, Hoffman S, Zhou F, Sandfort TGM , Leu CS. HIV/STI risk by migration status among workers in an urban high-end entertainment centre in Eastern China. Health Education Research 2011, 26(2): 283-295.

Class 10: April 12, 2016
(1) Kelvin EA, Yung J, Fong MW, Carpio A, Bagiella E, Leslie D, Leon P, Andrews H, Hauser WA. The association of living conditions and lifestyle factors with burden of cysts among neurocysticercosis patients in Ecuador. Transactions of the Royal Society of Tropical Medicine and Hygiene, 106(12): 763-9, 2012.

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

EPI 76100-01 Psychiatric and Mental Health Epidemiology
3 Credits
Spring 2016

Time and location	Graduate Center, Room 02, Thursdays, 6:30-8:30
Instructor	Angela Parcesepe, PhD, MPH, MSW Adjunct Assistant Professor Silberman Building (2180 Third Avenue, corner of 119th Street), Room 530 E-mail: ap3471@cumc.columbia.edu Phone: 646-774-6990 **Please note: Email is the best way to reach me.**
Office hours	Office Hours: Wednesdays, 4:00-5:00 pm and by appointment
Course website	The CUNY Blackboard website can be found at: https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course offers an introduction to the epidemiology of mental health and mental illness. This course takes an explicit epidemiologic perspective, focusing on the study of the burden and determinants of mental illness. We will review the extant literature on the epidemiology of specific disorders and evaluate studies that investigate risk factors for mental illness. We will consider methodologic challenges involved in the study of mental health and illness such as limitations to diagnostic techniques and screening instruments and issues surrounding co-morbidity. The course will also address the social consequences of mental illness, and consider how we may apply epidemiologic methods to promoting psychological wellbeing in the general population.
Course prerequisites	EPI 75000 or equivalent
Course format	Each class will begin with a lecture (45-60 minutes). Most classes will then be followed by class discussion.
Required reading and resources	1) Journal articles provided on Black Board 2) Selected chapters from *Psychiatric Epidemiology*. Second Edition. Tsuang MT, Tohen M. eds. Wiley-Liss, 2002 (Available on Black Board; NO NEED TO BUY THE TEXTBOOK)
Suggested reading and resources	Hunter College has a writing center that can provide guidance for paper writing (website for information: http://rwc.hunter.cuny.edu/). Students may use this and other resources in preparing their written

	assignments. Students should also feel free to discuss their papers as well as the computer assignments with each other and to seek assistance from others in editing their papers and clarifying their argument. However, the final paper or assignment that is turned in must be written by the student him or herself. Others may NOT contribute to the paper or assignment by writing portions of it.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Critically read and evaluate the strengths and limitations of epidemiologic literature from a methodologic perspective	Discuss epidemiological articles in terms of the strengths and weaknesses of the research design, data collection, analysis and interpretation. Evaluate key theoretical, methodological and substantive contributions of epidemiologic studies Synthesize extant epidemiologic literature on a research question of relevance to mental health	• Class participation • Reaction papers • Literature review
2. Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	Evaluate to what extent analytic strategies used in psychiatric epidemiologic literature are appropriate to answer research questions of interest	• Literature review
3. Identify key threats to validity (internal and external) within and across epidemiologic studies	Recognize potential sources of bias in psychiatric epidemiologic studies	• Literature review
4. Assess substantive and methodologic gaps in psychiatric epidemiologic literature and use epidemiologic methods to address such gaps	Identify key substantive or methodological gaps in the psychiatric epidemiologic literature Discuss how epidemiologic methods can be used to address gaps in psychiatric empirical literature	• Final paper • Final paper

Course Assessments

Literature review and final paper:

All students will prepare a final paper on a psychiatric epidemiology topic of their choosing. Students will work on their papers in two parts. The first part is a literature review of the selected topic, which must be uploaded to Blackboard by **prior to class on the date it is due**. This review should summarize current epidemiologic knowledge of the selected topic and should be between **6 and 8 double-spaced pages** with references cited appropriately. The final paper will include the literature review, with revisions based on feedback from the instructor, with two additional sections that (1) identify key gaps in the current literature and (2) comment on how epidemiologic methods can be used to address these gaps. Final papers should be between **12 and 15 pages, double-spaced, excluding references**. **Final papers are due on the last day of class** and must **be uploaded to Blackboard prior to that class.** More detailed information on the literature review and final paper will be provided on Blackboard.

Sources cited in the paper must be appropriately cited and referenced. The literature review as well as the final completed paper will be assigned a letter grade by the instructor. Late assignments will lose 5 points out of 100 for each day they are late (including weekends and holidays).

Class Participation & Individual Presentations: Students are expected to attend class in order to participate in discussions. Students will also be required to give brief presentations on their project twice during the semester. During the first presentation (approximately 10 minutes in length), students will share findings on their literature review. The second presentation will occur at the end of the semester and will consist of a 15 minute presentation on their final paper.

Reaction Papers: Students will write ten 1-2 page reaction/discussion commentaries related to the week's readings, along with a few questions for clarification and discussion. Reaction papers should synthesize and critically evaluate key theoretical, methodological and/or substantive contributions of the readings. This may consist of identifying questions that the readings provoke; critiquing problematic assumptions, logic, and measurement; discussing theoretical and empirical advances; and considering ideas for future directions. Late response papers will not be evaluated. The reflections are due by email to ap3471@cumc.columbia.edu before the start of that week's class. When referring to a specific article in the reflection, please use the author-date style. Format: single-spaced, typed, 12-point Times Roman font with 1-inch margins.

Grading

Evaluation criteria

In general, papers and presentations will be evaluated according to their demonstration of a) grasp of the topic, b) identification of the key points, c) synthesis of the material, and d) discussion of the implications for public health research and practice.

Class participation will be evaluated less according to the number of times a student participates or length of student contributions to class discussion and more on the student's contribution to the discussion, use of readings in discussion and engagement with the topic being discussed.

Grading rubrics for assessments

GRADING RUBRICS	(A+ to A-)	(B+ to B-)	(C+ to C)	(F)
Reaction papers	Demonstrates engagement with and synthesis of assigned readings and critical evaluation of key theoretical, methodological or substantive contributions of the readings to public health research and practice	Demonstrates familiarity with assigned readings and consideration of contributions of readings to public health research and practice	Demonstrates familiarity with assigned readings	Does not demonstrate familiarity with assigned readings
Literature review, final paper, and presentations	Provides a comprehensive synthesis of the topic with appropriate examples and discussion of their implications for public health research and practice	Describes the main concepts of the topic, provides some examples of relevance to public health research and practice	Describes the main concepts of the topic	Does not describe the main concepts of the topic

The relative weight of each course component is as follows:

Assignment	Weight
Class Participation	10%
Reaction papers (10 x 3 points each)	30%
Literature review	20%
Final paper	30%
Class presentation	10%
Total	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4

C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
Students are expected to attend class in order to participate in discussions. Students will also be required to give brief presentations on their project twice during the semester. If a student will not be able to attend a class, assignments should be e-mailed to the instructor before the class begins (e.g. before 6:30 pm the day of the class) to receive credit. The instructor will reply when a document is received. If a reply is not received by the student she or he should contact the instructor to be sure that the assignment was sent correctly. No more than two classes can be missed.

Late submission of assignments
Reaction papers are due by email to ap3471@cumc.columbia.edu before the start of that week's class. Late response papers will not be evaluated.

Literature reviews and final papers must be uploaded to Blackboard prior to the start of class on the day that they are due. Papers that are turned in late will lose 5 points out of 100 for each day they are late (including weekends and holidays).

Make-ups, rewrites, and extra credit
Make-up, rewrites and extra credit are not provided in this class.

Expectations of students
Students are expected to arrive on class on time and prepared to participate in discussion. Reading and written assignments are expected to be completed prior to every class.

The use of cell phones is prohibited during class. Laptops may be used for note-taking only.

Expectations for the instructor
The instructor is available during office hours and by appointment to assist students with assignments and course material. It is best to schedule an appointment in advance.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity
Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Please note: The schedule is subject to change throughout the semester.

Please refer to the current academic calendar for important dates (e.g., holidays, course drop, course withdrawal). The current academic calendar can be found at: http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%20-Repaired-FINAL.pdf

EPI 76100-01 Course Schedule, Spring 2016		
Date of class	**Topic**	**Assignments**
February 4, 2014	1. Course overview and introduction to the topic	
February 11, 2014	2. The DSM, diagnostic methods, and screening tools	Reaction Paper
February 18, 2014	3. Assessing mental disorders using available datasets	Reaction Paper
February 25, 2014	4. Investigating social and environmental risk factors for mental disorders	Reaction Paper
March 3, 2014	5. Epidemiology of affective and anxiety disorders	Reaction Paper
March 10, 2014	6. Epidemiology of psychotic disorders	Reaction Paper
March 17, 2014	7. Students present literature review	Literature Review Due
March 24, 2014	NO CLASS	
March 31, 2014	8. Characterizing posttraumatic stress in epidemiologic studies	Reaction Paper
April 7, 2014	9. Psychiatric co-morbidity and the consequences of illness	Reaction Paper
April 14, 2014	10. Service utilization and unmet need	Reaction Paper
April 21, 2014	11. Epidemiology of substance use disorders	Reaction Paper
April 28, 2014	NO CLASS	
May 5, 2014	12. Cross-cultural mental health	Reaction Paper
May 12, 2014	13. Mental illness in children and adolescents	
May 19, 2014	14. Student research presentations	Present Papers
May 22, 2014	15. Student presentations and the future of psychiatric epidemiology	Final Paper Due

SCHEDULE AND READINGS

Class 1: Course overview and introduction to the topic

Required Readings:

Tohen M, Bromet E, Murphy JM, Tsuang MT. Psychiatric epidemiology. Harvard Review of Psychiatry 2000; 8111-8125.

Insel T, Fenton WD. Psychiatric epidemiology: It's not just about counting anymore. Arch Gen Psych 2006;62:590-592.

Kessler RC. Psychiatric epidemiology: Select recent advances and future directions. Bulletin of the World Health Organization 2000;98:464-474.

Class 2: The DSM, diagnostic methods, and screening tools
Required Readings:

Frist MB. DSM-IV and psychiatric epidemiology. Chapter 13 in Textbook in Psychiatric Epidemiology. Second Edition. Tsuang MT, Tohen M. eds. Wiley-Liss, 2002.

Robins LN. Birth and development of psychiatric interviews. Chapter 11 in Textbook in Psychiatric Epidemiology. Second Edition. Tsuang MT, Tohen M. eds. Wiley-Liss, 2002.

Goldstein JM, Simpson JC. Validity: Definitions and application to psychiatric research. Chapter 5 In Textbook in Psychiatric Epidemiology. Second Edition. Tsuang MT, Tohen M. eds. Wiley-Liss, 2002.

Regier DA, Kaelber CT, Rae DS, Farmer ME, Knauper B, Kessler RC, Norquist GS. Limitations of diagnostic criteria and assessment instruments for mental disorders. Implications for research and policy. Arch Gen Psychiatry. 1998;55(2):109-15.

Class 3: Assessing mental disorder using available datasets
Required Readings*:*

Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., Wittchen H.-U., Kendler, K.S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. *Archives of General Psychiatry*;51:8-19.

Aldworth J, Colpe LJ, Gfroerer JC, et al. The National Survey on Drug Use and Health Mental Health Surveillance Study: calibration analysis. *Int J Methods Psychiatr Res* 2010;19(Suppl 1):1-98.

Strine TW, Dhingra SS, Okoro CA, et al. State-based differences in the prevalence and characteristics of untreated persons with serious psychological distress. *Int J Public Health* 2009;54(Suppl 1):9-15.

Class 4: Investigating social and environmental risk factors for mental disorder
Required Readings:

Kohn R, Dohrenwend BP, Mirotznik J. Epidemiological findings on selected psychiatric disorders in the general population. In: Dohrenwend BP, ed. *Adversity, stress, and psychopathology*. New York: Oxford University Press; 1998.

Kessler RC, Price RH, Wortman CB. Social factors in psychopathology: stress, social support, and coping processes. *Ann Rev Psychol* 1985; 36:531-72.

Dohrenwend BP, Levav I, Shrout PE, et al. Socioeconomic status and psychiatric disorders: the causation-selection issue. *Science* 1992.

Class 5: Epidemiology of affective and anxiety disorders
Required Readings:

Horwath E, Cohen RS, Wissman MM. Epidemiology of depressive and anxiety disorders. Chapter 16 In Textbook in Psychiatric Epidemiology. Second Edition. Tsuang MT, Tohen M. eds. Wiley-Liss, 2002.

Kessler RC, Berglund P, Demloer O, Jin R, Koretz D, Merikangas KR, Rush AJ, Walters EE, Wang PS. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication. JAMA 2003;289(23):849-857.

Tohen M, Angst J. Epidemiology of bipolar disorders. Chapter 17 In Textbook in Psychiatric Epidemiology. Second Edition. Second Edition. Tsuang MT, Tohen M. eds. Wiley-Liss, 2002.

Class 6: Epidemiology of psychotic disorders

Jablensky A, McGrath J, Herrman, H, et al. Psychotic disorders in urban areas: an overview of the Study on Low Prevalence Disorders. Australian and New Zealand Journal of Psychiatry 2000; 34:221-236.

Bromet EJ, Dew MA, Eaton WW. Epidemiology of psychosis with special reference to schizophrenia. Chapter 15 In Textbook in Psychiatric Epidemiology. Second Edition. Tsuang MT, Tohen M. eds. Wiley-Liss, 2002.

Class 7: Student presentations: Literature Review
No reading

Class 8: Characterizing posttraumatic stress in epidemiologic studies

Breslau N. The epidemiology of posttraumatic stress disorder: what is the extent of the problem? J Clin Psychiatry. 2001;62 Suppl 17:16-22.

Yehuda R. Post-traumatic stress disorder. N Engl J Med. 2002 Jan 10;346(2):108-14.

Yehuda R, McFarlane AC. Conflict between current knowledge about posttraumatic stress disorder and its original conceptual bias. *Am J Psychiatry* 1995;152:1705-1713.

Brewin C. Systematic review of screening instruments for adults at risk of PTSD. Journal of Traumatic Stress. 2005;18(1):53-62.

Class 9: Psychiatric co-morbidity and the consequences of illness
Required Readings:

Kessler RC, Nelson CB, McGonagle KA, Liu J, Swartz M, Blazer DG. Comorbidity of DSM-III-R major depressive disorder in the general population: results from the US National Comorbidity Survey. British Journal of Psychiatry. 1996;30:17-30.

Kessler RC, Ormel J, Demler O, Stang PE. Comorbid mental disorders account for the role impairment of commonly occurring chronic physical disorders: Results from the National Comorbidity Survey. Journal of Occupational and Environmental Medicine 2003;45(12):1257-1266.

Brady KT, Sinha R. Co-occurring mental and substance use disorders: the neurobiological effects of chronic stress. Am J Psychiatry. 2005;162(8):1483-93.

Kessler RC, Foster C, Saunders W, Stand P. Social consequences of psychiatric disorders: I. Educational attainment. American Journal of Psychiatry. 1995;152:1026-1032.

Greenberg PE, Sisitsky T, Kessler RC, Finkelstein SN, Berndt ER, Davidson JR, Ballenger JC, Fyer AJ. The economic burden of anxiety disorders in the 1990s. J Clin Psychiatry. 1999;60(7):427-435.

Class 10: Service utilization and unmet need

Wang PS, Lane M, Olfson M, Pincus HA, Wells KB, Kessler RC. Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. Arch Gen Psychiatry. 2005;62(6):629-640.

WHO World Mental Health Consortium. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health surveys. JAMA 2004;291(21):2581-2590.

Burke JD. Mental health services research. Chapter 6 In Textbook in Psychiatric Epidemiology. Second Edition. Tsuang MT, Tohen M. eds. Wiley-Liss, 2002.

Steinwachs DM, Kasper JD, Skinner EA. Patterns of use and costs among severely mentally ill people. *Health Affairs* 1992;11(3):178-185.

Class 11: Epidemiology of substance use disorders
Required Readings:

TBD

Class 12: Cross-cultural mental health
Required Readings:

TBD

Class 13: Mental illness in children and adolescents
Required Readings:

Achenbach TM, McConaughy SH, Howell CT. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. Psychological Bulletin. 101(2):213-232.

Carter AS, Wagmiller RJ, Gray SAO, McCarthy KJ, Horwitz SM, Briggs-Gowan MJ. (2010). Prevalence of DSM-IV disorder in a representative, healthy birth cohort at school entry: Sociodemographic risks and social adaptation. Journal of the American Academy of Child & Adolescent Psychiatry, 49(7): 686-698.

Merikangas KR, He J, Burstein M, Swanson SA, Avenevoli S, Cui L, Benjet C, Georgiades K, Swendsen J. (2010). Lifetime prevalence of mental disorders in U.S. adolescents: Results from

the National Comorbidity Survey Replication – Adolescent Supplement (NCS-A). Journal of the American Academy of Child & Adolescent Psychiatry, 49(10): 980-989.

Class 14: Final student presentations
No readings

Class 15: Final student presentations and future of psychiatric epidemiology
Required Readings:
TBD

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

EPI 76400 Epidemiology Methods III
3.0 Credits
Spring 2016

Time and location	The Graduate Center (34th Street & 5th Avenue) room C01 Wednesdays 6:30-8:30pm
Instructor	Associate Professor, Elizabeth Kelvin, PhD, MPH Silberman building (2180 Third Avenue on 119th Street), Room 543 E-mail: ekelvin@hunter.cuny.edu Phone: 212-396-7751 Email is preferred method of communication
Office hours	Tuesdays 4:30-5:45 or by appointment
Course website	Black Board: https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course exposes students to intermediate methods in epidemiologic research and provides students with an opportunity to consider how these strategies complement and advance the more commonly used strategies. Doctoral and master's students will apply these concepts and theoretical knowledge to quantitative analyses using different types of epidemiologic data. Emphasis will be placed on developing practical skills relevant to contemporary epidemiologic research. Students will explore individual-level exposure-disease associations using classic study designs and techniques, as well as more recent methods that shift away from identifying individual risk factors for disease causation to the description and analysis of environmental systems that give rise to both exposures and health states. Students will also examine potential mediators of these relations.
Course prerequisites	EPI 75100 (Epidemiological Methods II) and BIOS 75100 (Applied Biostatistics II)
Course format	This class is taught as a combination of lecture, student presentation/student-led group discussion, computer-based data analyses, and short analytic papers. In general, the first hour of class will be used for lecture and discussion of the readings, and the second hour will be used to work on either a computer-based exercise or a case study. The computer based exercises provide an opportunity to practice applying methodologies discussed, and case studies provide an opportunity to understand how the methods are

	used to address a real world challenge.
Required reading and resources	• Rothman, KJ and Greenland, S. Modern Epidemiology, 3nd edition. Lippincott-Raven, 2008 • Hernan M. Causal Inference, 1st edition. Chapman & Hall/CRC, 2011. Draft chapters available at: http://www.hsph.harvard.edu/faculty/miguel-hernan/causal-inference-book/ • Additional readings as described below
Suggested reading and resources	For help with SAS programming, goggle is usually very helpful, but students may also consider referring to the following suggested textbooks: (1) Delwiche, LD & Slaughter, SJ. 2008. The Little SAS Book: A Primer (4th edition). Cary, NC: SAS Institute, Inc. (2) Cody, RP & Smith, JK. 2005. Applied Statistics and the SAS Programming Language (5th edition). Upper Saddle River, NJ: Prentice Hall.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Identify key sources of data for epidemiologic purposes	• Conduct in-depth epidemiologic analyses using data from local and public use datasets • Recognize how epidemiologic studies can build upon routine or mandatory administrative data sources	Papers & presentations
2. Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	• Use descriptive statistics to characterize disease states in the context of an analytic study • Appreciate the strengths and limitations of stratified analyses in data analysis	Papers & presentations
3. Critically read and evaluate the strengths and limitations of epidemiologic literature from a methodologic perspective	• Discuss epidemiologic theory and principles from published literature and in the context of a changing field of inquiry • Identify and critique research hypotheses in published literature	Papers & presentations
•4. Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	• Develop testable research hypotheses using principles from causal theory, including causal diagrams • Operationalize hypotheses into statistical testing strategies	Papers & presentations

5. Identify key threats to validity (internal and external) within and across epidemiologic studies	• Recognize key sources of bias and measurement error in published literature and their potential effects	Papers & presentations
6. Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	• Develop capacity to complete in-depth epidemiologic and statistical analyses using SAS	Papers & presentations

Course Assessments

Short analytic papers: Students will complete two papers presenting the results of data analysis. Three paper topics together with data and instructions will be posted on BB each with its own due date. Hunter students must pick two of the papers to complete for the course. If a student would like to complete all 2 papers, the paper grade will be calculated using the two papers that received the highest grades.

All short papers should be 6-8 pages of text (double-spaced, 12-point font, 1 inch margins). Papers must be handed in on paper on the assigned day. If a student is unable to attend class on the day when a paper is due, the paper may e-mail it to the class instructor. The e-mail must be sent before the beginning of the class when the paper is due (i.e. by 6:30 pm). Students e-mailing papers will be sent an acknowledgement of receipt. If you do not receive an acknowledgement within 24 hours of e-mailing the paper, contact the instructor to make sure that the e-mail went through. Late papers will have 5 points deducted for each day they are late (including holidays and weekends. Papers should roughly be organized according to the following format:

Brief introduction/Literature review	(1-2 page)
Methodology	(2-3 pages)
Results	(1-2 pages)
Discussion	(1-2 pages)
Tables & Figures	(1-5, not included in the 10 page limit)
List of Citations	(As many as necessary)
Appendix with annotated SAS syntax	(as many as necessary)

Students may submit as many tables and figures as they wish to accompany this paper to demonstrate their systematic analysis strategy, but recall the power of parsimonious presentation (fewer is sometimes better). Tables may be in formats that are more work-in-progress than typically seen in published journals (for example, explorations of confounding or interaction can be shown). All tables and figures should be numbered and include self-explanatory titles and labels and go at the end of the paper. Tables and figures should be references in the text by table/figure number.

All analysis strategies should involve the following, when appropriate:

a) Basic descriptive epidemiology
b) Univariate analysis
c) Analysis for confounding
d) Analysis for interaction
e) Multivariable model building

Citations MUST be inserted into the paper using citation software (Endnote, Refworks, Zotero), which are available online (Graduate Center: http://libguides.gc.cuny.edu/c.php?g=159565&p=1045007 Hunter:

http://library.hunter.cuny.edu/citation-tools). It is strongly suggested that students download (when appropriate) the software and start working with is in the very beginning of the semester to ensure that they are comfortable with the program by the time they start working on papers for the course. Five points will be deducted from papers that do not have the citations inserted using Endnote.

Individual presentations: Students will present the methods and results of each of the 2 papers so that the different approaches taken can be compared and discussed. Students who write all 3 papers will present on all 3 papers and their presentation grade will be calculated using the two highest grades. Missing a scheduled presentation will results in a zero grade for that presentation.

Group Session: Students will be randomly assigned into teams of 2-3. Each team will be responsible for teaching one class. While the responsible student team will present the material and lead the discussion, it is expected that ALL students will be prepared for and actively participate in the discussion, and participation grades will reflect the level of engagement in these discussions. If a student misses his/her scheduled presentation a grade of zero will be assigned for that component of the grade.

Attendance & class participation: Each student is expected to attend and actively participate in each class. Two absences are allowed with no effect on the participation grade

Grading

Evaluation criteria

Describe the grading methodology that will be used to assess performance in the class. If a rubric is not used, what method will be used to evaluate graded assignments?

The relative weight of each course component is as follows:

Assessment	**Weight**
Paper 1	25%
Paper 2	25%
Paper 3	25%
Presentation 1	5%
Presentation 2	5%
Presentation 3	5%
Group Session	5%
Attendance & Participation	5%
TOTAL	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100

A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Two absences are allowed with no effect on the participation grade

Late/incomplete submission of assignments

- Late papers will have 5 points (out of 100) deducted for each day they are late (including holidays and weekends
- Students who miss their scheduled presentation (individual or group) will receive a grade of zero which will be averaged into their course grade.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit assignments. This is an advanced graduate level course and as such it is assumed that students are able to manage their time and complete assignments at the high level expected for such a course.

Expectations of students

- This is an advanced, doctoral level epidemiology methods course. It is assumed that by this point students feel relatively comfortable writing research-style papers and conducting statistical analysis using SAS. Hunter students should be aware that they can bring their laptop computers to the CUNY School of Public Health library and get SAS software loaded for their home use. GC students can access SAS through the intranet (contact It for support). SAS has an excellent help menu and that there is a large amount of SAS code available online easily accessible through Google. In addition, many publicly available data websites (e.g. the NYCDOH) provide sample SAS code for analyzing data collected using their complex sampling methods. Students should not expect to be given all the SAS code they will need to analyze the data for their papers and should plan to spend time searching for examples of the code they need.
- There are two software packages you will need to have access to in this class: (1) SAS and (2) citation software. Students should arrange access to the software and start using it early in the semester so s to be prepared when they start working on the assigned papers. The software for this course will also be available for student use at the following locations (1) on the laptop computers in the library in the Silberman building should have SAS and Endnote (2) the computer labs at 68th Street should have SAS and Endnote (hours can be found at this link: http://www.hunter.cuny.edu/it/it-services/computer-labs-alias), and the computers in the GC library should have this software. Most students will likely have to schedule time to come to their campus or some other computer lab to complete the class assignments. Students should keep this in mind when deciding when to take this class and in planning their schedules throughout the semester. Not having access to software is not a valid excuse for turning-in an assignment that is incomplete (e.g. does not have citations) or late.
- If a student will not be able to attend a class, assignments due on that day should be e-mailed to the instructor or, when appropriate, posted on BB before the class begins (e.g. before 6:30pm the day of the class) to receive full credit. The instructor will reply when a document is received via e-mail. If a reply is not received by the student he/she should contact the instructor to be sure that the assignment was sent correctly. Students should keep their sent e-mail to demonstrate that the assignment was turned-in and when, in the event that the instructor has a questions about this. Late assignments will receive a penalty in the form of a grade reduction.
- Students must turn in their own, independently written papers. However, students are encouraged to discuss their data analysis approaches and papers with colleagues.

Expectations for the instructor

- Power Point lecture slides will be available for download on Blackboard prior to class.
- •Students can expect the instructor to start and end class on-time and give feedback on assignments in a constructive way.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Note that the schedule is subject to change throughout the semester.

COURSE SCHEDULE			
Date	**Lecture and Discussion Topics**	**Lab**	**Assignments Due (see below for readings)**
Class 1: Feb 3, 2016	Introduction & statistics review	Review of data analysis with SAS I	
Class 2: Feb 10, 2016	Causality & DAGS	Discussion	
Class 3: Feb 17, 2016	Developing and testing hypotheses & sampling	Data analysis of complex samples in SAS	
Class 4: Feb 24, 2016	Confounding & effect modification	Lab to explore confounding and effect modification	
Class 5: March 2, 2016	Cohort Analysis	Lab to explore person time	PAPER 1 DUE: DESCRITIVE ANALYSIS & HYPOTHESIS TESTING OF A CROSS SECTIONAL STUDY
Class 6: March 9, 2016	Student Presentations More on DAGS	Discussion	Student Presentations
Class 7: March 16, 2016	Model Development & DAGS	Lab to explore modeling	
March 23, 2016 follows a Friday schedule			
Class 8: March 29, 2016	Multilevel models	Lab I to explore neighborhood and multilevel models	
Class 9: April 6, 2016	More on Multilevel Models	Lab II to explore neighborhood and multilevel models	PAPER 2 DUE: ANALYSIS OF DATA FROM A COHORT STUDY
Class 10: April 13, 2016	Student presentation of paper 2 Analysis of case control study data	Lab to explore case control study data with without matching	Student Presentation

	with and without matching		
Class 11: April 20, 2016	Missing Data & Multiple Imputation Guest Lecture by: Matthew Romo, DPharm, MPH	Lab to explore multiple imputation in SAS	
April 22-30, spring recess			
Class 12: May 4, 2016	Internal validity and sensitivity analysis	Lab to explore sensitivity analysis	
Class 13: May 11, 2016	Other topic of interest TBD by class		
Class 14: May 18, 2016	Student presentations of paper 3 Putting it all together	Discussion	Presentation on paper 3
Class 15: May 25, 2016	NO CLASS MEETING		PAPER 3 DUE: NEIGHBORHOOD ANALYSIS

READING ASSIGNMENTS

Class 2 (February 10, 2016): Causality & DAGS
Required readings:
(1) Rothman Text Ch. 2 (Causality) & 6(Causal Diagrams)
(2) Hernan Website Ch. 1 (A Definition of Cause and Effect), Ch. 3 (Observational Studies) & Ch. 6 (Graphical representation of causal effects)
(3) Cornfield J et al. "Smoking and lung cancer: recent evidence and a discussion of some questions" JNCI 1959 (reprint IJE 2009; 38: 1175- 1191)

Recommended readings:
(1) Cox DR. "Commentary smoking and lung cancer: reflections on a pioneering paper" IJE 2009; 38: 1192-1193.
(2) Greenhouse JB. "Commentary: Cornfield, epidemiology and causality" IJE 2009; 38: 1199-1201.
(3) Vandenbroucke JB. "Commentary: 'Smoking and lung cancer'—the embryogenesis of modern epidemiology" IJE 2009; 38: 1193-1196.
(4) Zwahlen M. "'Commentary: Cornfield on cigarette smoking and lung cancer and how to assess causality" IJE 2009; 38: 1197-1198.

Class 3 (February 17, 2016): Developing and Testing Hypotheses & sampling
Required readings:
(1) Rothman Text Ch. 4, pp.51-62 (Measures of Effect), Ch. 10 (Precision) & Ch. 13, pp. 213-219 (Fundamentals of Analysis)
(4) Sakshaug JW & West BT. Important considerations when analyzing health survey data collected using a complex sample design. American Journal of Public Health 2014, 104(1): 15-16.
(5) Martin K. Analyzing Data from Complex Samples Using PROC SURVEYFREQ in SAS® 9.2. Available at: http://www.wuss.org/proceedings10/HOC/Analyzing%20Data%20from%20Complex%20Samples%20Using%20PROC%20SURVEYFREQ%20in%20SAS%C2%AE%209.2.pdf.

Class 4 (February 24, 2016): Confounding & effect modification
Required readings:
(1) Rothman Text Ch. 7 (confounding), Ch. 9 (Validity), Ch. 15 (Introduction to Stratified Analysis)
& Ch. 5 (concepts of Interaction)
(2) Hernan Website Ch. 7 (confounding) , Ch. 4 (Effect Modification) & Ch. 5 (Interaction)
(3) Sun X, Briel M, Walter SD, Guyatt GH. Is a subgroup effect believable? Updating criteria to evaluate the credibility of subgroup analyses. BMJ 2010; 340: 850-855.

Class 5 (March 2, 2016): Cohort Analysis Methods
Required readings:
(1) Rothman Text Ch, 7 (Cohort Studies)
Recommended readings:
(1) Hernan Website Ch. 17 (Causal survival Analysis)
(2) Samet JA. Perspective: cohort studies Epidemiol Rev 1998; 20(1): 135-6.
(3) Doll, Richard 2004 “Cohort studies: history of the method I. prospective cohort studies” pp. 75-86 in A history of epidemiologic methods and concepts, edited by A Morabia.
(4) Doll, Richard 2004 “Cohort studies: history of the method II. Retrospective cohort studies” pp. 152-160 in A history of epidemiologic methods and concepts, edited by A Morabia.

Class 6 (March 9, 2016): More on DAGS
(1) Hernan et al. Causal knowledge as a prerequisite for confounding evaluation: an application to birth defects epidemiology AJE 2002; 155: 176-184.
(2) Fleischer NL, Diez Roux AV. Using directed acyclic graphs to guide analyses of neighborhood health effects: an introduction. JECH. 2008 Sep;62(9):842-6.
(3) Glymour, M. Maria. 2006. "Using causal diagrams to understand common problems in social epidemiology." in Methods in Social Epidemiology, edited by J. Michael Oakes and Jay S. Kaufman. San Francisco: Jossey-Bass / Wiley.

Class 7 (March 16, 2016): Model Development & DAGS
Required readings:
(1) Rothman Text Ch. 20 (Regression Models)
(2) Rothman Text Ch. 21 (Regression Modeling)
Recommended readings:
(1) Hernan Website Ch. 11 (Why Model?)
(1) Donders AR, van der Heijden GJ, Stijnen T, Moons KG. Review: a gentle introduction to imputation of missing values. J Clin Epidemiol 2006;59:1087-1091.

Class 8 (March 29, 2016): Multilevel Analysis
Required readings:
(1) Merlo J, Chaix B, Yang M, Lynch J, Rastam L. A brief conceptual tutorial of multilevel analysis in social epidemiology: linking the statistical concept of clustering to the idea of contextual phenomenon. J Epidemiol Community Health 2005;59:443–449..
(2) Diez-Roux A. The Study of Group-Level Factors in Epidemiology: Rethinking Variables, Study Designs, and Analytical Approaches. Epi Reviews 2004, 26: 104-11
(3) Theall KP et al. Impact of small group size on neighborhood influences in multilevel models. JECH 2010 May 27.
Recommended readings:
(1) Hubbard AE et al. To GEE or not to GEE: comparing population average and mixed models for estimating the associations between neighborhood risk factors and health. Epidemiology. 2010 Jul;21(4):467-74.
(2) Boone-Heinonen J et al. Where can they play? Outdoor spaces and physical activity among adolescents in U.S. urbanized areas. Prev Med. 2010 Jul 22

Class 9 (April 6, 2016): More on Multilevel Models
Required readings:
(1) Merlo J, Chaix B, Ohlsson H, Beckman A, Johnell K, Hjerpe P, Rastam L, Larsen K. A brief conceptual tutorial of multilevel analysis in social epidemiology: using measures of clustering in multilevel logistic regression to investigate contextual phenomena. J Epidemiol Community Health 2006;60:290–297.

Class 10 (April 13, 2016): Case-control analysis methods
Required readings:
(1) Rothman Text Ch. 8 (Case-Control Studies)
(2) Hernan Website Ch. 2 (RCT) & Ch. 3 (Observational Studies)
Recommended readings:
(1) Paneth N and Susser M 2004 “Origins and early development of the case-control study: part 2, The case-control study from Lane-Claypon to 1950” p. 360-365 in A history of epidemiologic methods and concepts, edited by A Morabia.

Class 11 (April 20, 2016): Multiple imputation with SAS
Required Readings
TBD

Class 12 (May , 2016): Internal validity & sensitivity analysis
Required readings:
(1) Hernan Website Ch. 8 (Selection Bias)
(2) Hernan Website Ch 8 (Selection Bias) & 9 (Measurement Bias)
(3) Cole SR et al. Illustrating bias due to conditioning on a collider. IJE 2010; 39:417-420
(4) Greenland S. Basic methods for sensitivity analysis of biases. Int J Epi 1996;2:1107-1116.
Recommended readings:
(1) Bodnar LM, Tang G, Ness RB, Harger G, Roberts JM. Periconceptual vitamin use reduces the risk of preeclampsia. Am J Epidemiol 2006;164:470-477.
(2) Hernán MA, Cole SR. Invited Commentary: Causal diagrams and measurement bias. Am J Epidemiol. 2009 Oct 15;170(8):959-962
(3) Shahar E. “Shahar Responds to ‘‘Causal Diagrams and Measurement Bias’’ Am J Epidemiol. 2009 Oct 15;170(8):963-964.

Class 13 (May 11, 2016):
Assigned Readings
TBD

NOTE: Additional readings may be added throughout the semester.

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

EPI 77201: Time Series
1.5 Credits
Winter 2016

Time and location	Graduate Center 6418, Tues and Thursdays 6:05-8:30
Instructor	Professor Jay Verkuilen, PhD Email: jverkuilen@gc.cuny.edu Phone:
Office hours	Tuesdays 4:00pm – 6:00pm
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course will discuss models for data with serial dependence, often referred to as time series. Much of the terminology in this area comes from economics, particularly macroeconomics, and many of the models are rooted in that area. However, serial dependence appears in many areas of science, including psychology, special education, epidemiology, and environmental science. These tools are important even in statistics itself: In Bayesian analysis using Markov chain Monte Carlo (MCMC) estimation, time series analysis methods are used to diagnose model fit.
Course prerequisites	N/A
Course format	Lecture/Seminar
Required reading and resources	R.J. and Athanasopoulos, G. (2013) Forecasting: principles and practice.
Suggested reading and resources	Moeyaert M et al. (2012). Coding the Design Matrix

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Critically read and evaluate the strengths and limitations of epidemiologic literature from a methodologic perspective	Interpret a times series analysis Explain the strengths and weaknesses of a times series analysis	Project Project
Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	Explain the difference between linear models and time series analysis Explain the concept of serial dependence	Homework 1 Homework 1
Identify key threats to validity (internal and external) within and across epidemiologic studies –	Describe how a times series model can be used for forecasting Apply Model Building techniques and Diagnosis to time series models	Homework 4 Homework 3
Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	Implement times series models in stata with appropriate graphics	Homework 2

Course Assessments

The course will be assessed based on a four weekly assignments and a project.

Grading

Evaluation criteria

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Grading rubrics for the weekly assignments and project

(A+ to A-)	(B+ to B-)	(C+ to C)	(F)
Provides a comprehensive synthesis of the topic with appropriate examples and discussion of the implications for practice	Identifies the implications of the key points in the topic, provides some examples and relevance to practise	Describes the main concepts in the topic	Inability to identify and describe the main concepts

Project: The project will be a take-home assignment involving statistical analysis in stata of an analytic question, and students are expected to analyze the provided data, interpret findings in the context of the literature, and draw conclusions. The project must be completed independently and students may not discuss the project with classmates. Students will be given the questions 1 week before the project is due.

The relative weight of each course component is as follows:

Assessment	Weight
Homeworks x4	40
Project	60
	100

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation
Attendance is mandatory and class participation may generate extra credit.

Late/incomplete submission of assignments
Late or incomplete assignments will be accepted at the discretion of the instructor

Make-ups, rewrites, and extra credit
Make-ups and not available, but rewrites are allowed.

Expectations of students
- You must sign up for Blackboard so that you can receive course readings, updates and obtain lecture notes and other handouts. For instructions on registering for a portal account in order to access Blackboard, go to: https://portal.cuny.edu/portal/site/cuny/index.jsp?epi-content=LOGIN.
- Please forward your CUNY e-mail to your most frequently checked e-mail address. Check your e-mail regularly so that you can receive emergency communications and periodic updates about the class.
- You are expected to complete readings and written assignments prior to class.
- Any written assignments should be uploaded to blackboard by 4pm on the day of the class.
- Students are expected to participate in class discussions, treating their classmates and the instructor with respect.

Statistical analysis will be conducting using stata. stata has an excellent help menu and that there is a large amount of stata code available online easily accessible through Google..

Expectations for the instructor

- Power Point lecture slides will be available for download on Blackboard after class.
- The instructor is available during office hours and by appointment to assist students with assignments, course material, and exam preparation. The preferred method of communication with the instructor is e-mail.
- Grades for each piece of work will be uploaded to blackboard within a week.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester.

- Please refer to the current academic calendar for important dates (for example: holidays, course drop, course withdrawal).

Course schedule

Session	Date	Topic	Reading	
1	5jan16	Linear Model review		
2	7jan16	Linear Model – serial dependence		
3	12jan16	Graphical Analysis		
4	14jan16	ARIMA Models overview		
5	19jan16	ARIMA models Model Building and Diagnosis		
6	21jan16	ARIMA Models Forecasting		
7	26jan16	Interrupted Time Series		
8	28jan16	Markov Switching Models		

Brooklyn College, 2900 Bedford Avenue, Brooklyn, NY 11210

HNSC 7120X: Fundamentals of Epidemiology
Spring, 2016 (ET6A, Code 32558)

Catalogue description	Principles and application of epidemiological analysis, illustrations of incidence, distribution, multiple determinants, and control of disease. Methods of investigation. Sources, presentation, and interpretation of Data.
Course meets	Tuesdays, 6:30-9:00pm, Room 232 New Ingersoll.
Instructor	Prof. James Greenberg
Email	jamesg@brooklyn.cuny.edu (Email is best way to contact me; expect a response within 2 business days)
Phone	718-951-5000 ext. 2736
Office	4107 Old Ingersoll
Office hours	M & W 1-2 pm & Tu 5:15 - 6:15 pm, or by appointment.
Required Text	Gordis L. Epidemiology. 5th ed. Philadelphia, PA: Saunders, Elsevier, 2013 (ISBN: 978-1-4557-3733-8)
Additional Required Reading Materials	Online in Blackboard.* Other additional Materials may be supplied by the instructor.
Additional Required Materials	A simple calculator should be brought to every meeting of our class, including the Midterm and Final Exam. Cell phones are not allowed.
Reserve Material	Gordis L. Epidemiology. 5th ed. Philadelphia, PA: Saunders, Elsevier, 2013 (ISBN: 978-1-4557-3733-8)

* It is YOUR responsibility to successfully log onto Blackboard throughout the semester. For more information on using Blackboard, see: **http://library.brooklyn.cuny.edu/blackboard**

Competencies and Objectives:

Apply the public health core functions of assessment, policy development and assurance	• Describe in writing the purpose of surveillance and how surveillance is used in public health practice • Explain the difference between incidence and prevalence • Describe the process of identifying and testing potential targets of intervention and give examples of effective and ineffective public health interventions • Describe the process of identifying vulnerable sub-populations, and give examples • Describe under what conditions screening is appropriate	Sessions 1-3 Epi paper Participation Midterm Home Work Lab 1-3
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe epidemiological studies, including observational, quasi-experimental and experimental studies • Differentiate between primary and secondary data collection and identify possible sources of secondary data • Explain the difference between correlation and causation; risk factors/predictors and causes • Describe the causal inferences which can be made from experimental, quasi-experimental and observational studies using published examples	Sessions 2-12 Epi paper Participation Midterm Final Exam Home Work Lab 2-12
Adhere to ethical and social justice principles and standards	• Describe circumstances in which an experimental study would and would not be ethical • Describe major disparities in life expectancy nationally and globally	Session 13 Participation Final Exam
Interpret and analyze public health literature and apply evidence-based research	• Access and use published data to accurately describe in writing the health of populations and factors that affect health in terms of person, time and place characteristics • Distinguish between narrative and systematic reviews • Systematically review the literature on a specific topic using a PICO question	Sessions 3-12 Epi paper Participation Midterm Final Exam Home Work Lab 3-12
Apply basic statistical and informatics techniques	• Explain in a few sentences the principle	Sessions 1-7 & 9-11

	of screening • Define lead time and length bias and how these biases may impact screening program evaluation • Describe in a few short sentences sensitivity, specificity, positive predictive value and negative predict value of a screening test compared to a gold standard test • Calculate and interpret a mean, a proportion, a rate and an odds ratio, • Explain the difference between relative and absolute risk • Calculate age-standardized rates	Epi paper Participation Midterm Final Exam Home Work Lab 1-7 & 9-12
Communicate public health information through oral, written, digital and visual presentation	• Describe the validity, utility and feasibility of tests used for screening and diagnosis of health conditions • Present visually information on key public health topics such as the major causes of death nationally and globally	Sessions 2-5 & 7-13 Epi paper Participation Midterm Final Exam Home Work Lab 2-5 & 7-12
Design and evaluate interventions to prevent or control public health problems	• List the strengths and weaknesses of different techniques for evaluating interventions • List the strengths and weaknesses of different techniques for controlling public health problems	Sessions 2-5 & 7-13 Epi paper Participation Midterm Final Exam Home Work Lab 2-5 & 7-12
Collect, analyze and interpret public health data	• Explain how to choose and apply appropriate study designs to answer a research question • Explain the interpretation of different measures of population health, such as life expectancy, quality adjusted life years	Sessions 2-11 Epi paper Participation Midterm Final Exam Home Work Lab 2-11

SECTION 1. ASSESSMENT

	Percentage of Grade

Participation Includes attendance, answers to instructor's questions about assigned readings, in-class writing, group work, and active participation in class discussion	10%
Epi Paper* Topic Selection (2%), draft (5%), final paper (10%), individual class presentation (3%)	20%
Midterm (~60 minutes, multiple choice & short answer) There will be one midterm that will contain ~30 questions.	25%
Homework* There will be 10 homework assignments due, to be handed in at the start of class.	10%
Final Exam (during final class session, multiple choice & short answer) There will be ~40 questions.	35%
Total	**100%**

*** Paper assignments** must be uploaded into SafeAssign in Blackboard by 6:00 pm on the day that they are due. **Assignments cannot be submitted by email**

MAKEUPS: Makeup exams and late homework and epi paper assignments will only be accepted with a very good reason, e.g. court stipulation, death certificate, physician's note or police report.

PLEASE NOTE: To maintain fairness among all students, there will be no extra credit assignments at any point to make up for a low grade.

Grades will be Posted in Blackboard within a few days after the Midterm and Final Exam.

Grading Scale: A+ 97-100; A 93-96; A- 90-92; B+ 87-89; B 83-86; B- 80-82; C+ 77-79; C 73-76; F Less than 73

* Note that, per Brooklyn College regulations, there is no "D" grade. For more information, please see the "Academic Regulations and Procedures" section of the Brooklyn College Graduate Bulletin

SECTION 2. CLASS FORMAT & POLICIES

Class Format

The first part of each class will be a lecture/discussion session that will involve, instructor's questions about assigned readings, Powerpoint slides and will last about 1 ½ hours. The Powerpoint slides are posted in Blackboard. The second part of each class will be a lab in which students will be divided into groups for the purpose of discussing the questions and answers in the homework assigned for the class.

Homework

There will be 10 weekly homework assignments due at the start of class. Five of the homework assignments, randomly selected, will be graded.

Homework assignments will be posted in Blackboard at least one week prior to class. **Homework assignments are described as "Lab Ex 2" through "Lab Ex 12"** on the class schedule (down below). Each assignment will have multiple-choice and short-answer questions.

Answers to multiple-choice questions should be submitted on assignment sheets and Scantron sheets, obtainable from the instructor. Answers to short-answer questions should be typed on assignment sheets. **Show your work** on assignment sheets for answers that require numeric calculations. Submitted Scantron and assignment sheets should have your name, course number and name, Lab number and date clearly marked.

Bring two copies of your completed assignment sheet and one copy of your completed Scantron sheet to each class in which the assignment is due. Hand in your completed Scantron and one copy of the completed assignment sheet at the start of class. No late assignment or Scantron sheets will be accepted

I will calculate the grade for homework assignments (10% of course grade) as follows: 1) 0.5% of course grade for handing in each of the 10 completed Scantrons plus completed assignment sheets on time; & 2) 1% of course grade for each of the 5 graded homework assignments.

Keep the second copy of your completed assignment sheet for the lab-session group discussion of the questions and answers. I will present correct answers toward the end of the lab session

Epi Paper

The epi paper is an opportunity for you to conduct a structured, formal investigation of a health topic of interest to you. The paper topic is of your choosing, but must be approved by me.

Generally, any aspect of public or individual health that could be, or has been, improved as a result of epidemiological research would be suitable. Your topic must involve two epidemiological research studies aimed at assessing the association between a specific disease and a potential causative agent or risk factor. Review articles and meta-analyses do not qualify.

There will be three submissions:

1) Your proposed topic, to be typed and handed in at the start of the third class of the semester and submitted into SafeAssign in Blackboard before 6 pm on the day of the third class (2% of course grade). This assignment should be on one page and should contain:
   - your name
   - your proposed topic (include specific disease and potential causative agent)
   - the research question to be addressed
   - expected conclusions
   - two or more references, including the two studies that you propose to summarize and critique. All references should be in a standard format.

2) A 2-3 page draft due at 6 pm on the day of the 5th class of the semester (5% of course grade), to be submitted into SafeAssign in Blackboard. The draft should contain:

. Title of your paper & your name
. Word count (max 500 words, not counting references)
. Introduction which should present evidence, with references, showing why the topic is important.
. Body of the paper, containing a summary of two (2) peer reviewed epidemiological studies on your topic.

FORMAT FOR EACH SUMMARY (Use bold words as headings)
. **Title** of the study
. **Objectives** (Objectives of the study. Two sentences at most)
. **Type of Study**
. **Sample** (how was the sample obtained. Two sentences at most)
. **Hypothesis of Interest** (One sentence)
. **Primary exposure variable of interest** (maximum of one variable)
. **Primary outcome variable of interest** (maximum of one variable)
. **Confounder Variables**
. Method of Statistical Analysis for hypothesis of interest (maximum of three sentences)

. **Give Data & p-values for results** Please see the description of the Epi Paper in our syllabus **for the primary exposure and outcome variables (**Two sentences at most)
. **Conclusions** (Two sentences at most)
. **Limitations of the Study** – maximum of two limitations
. **Summary of Your Conclusions from the Two Studies**– (three sentences maximum).
. **Recommendation for the Future**– (three sentences maximum)
. **List of References in Standard Format- (**References should be papers published in peer-reviewed journals, information on government websites or in government reports, or other similarly authoritative sources)
. **Copy of the Abstract of Each of the Two Studies Summarized in Your Paper**

3) Final 2-3 page paper due at 6 pm on the day of the 11th class of the semester (10% of course grade). Format is the same as for the draft;

4) Oral presentation of your paper (10-15 minutes), aided by the overhead projector in 14th class of the semester (3% of course grade). Your presentation should be in MSWord format. Please ensure that fonts are large enough to be easily read by your audience.
IT IS YOUR RESPONSIBILITY TO CHECK PRIOR TO THE CLASS that your data file and thumbdrive are compatible with the Windows computers on the Brooklyn College campus.

Submission policy

- Unless noted otherwise, written assignments must be successfully uploaded to SafeAssign on Blackboard by 6:00 pm on the day on which they are due. Unless you do this, the assignment will not be considered to have been submitted.

Formatting of paper assignments

- Write your name, title of your paper, course number and name and date at the top of the assignment
- Unless otherwise specified, your paper assignment should be typed, double spaced, with 1 inch margins and 12 point font. All pages must be numbered.
- All statements of fact or expert opinion should be supported with one or more references.
- You must properly cite each data source, both in the text and in a reference section at the end of the paper, per a standard format of your choosing.
- Points will be automatically deducted from your grade if your assignment is not formatted as instructed. Here are a few examples:
    - If your assignment has 1.5 spacing rather than double spacing, you will lose points
    - If your margins are 1.25" and not 1", you will lose points
    - If your assignment does not have a bibliography, literature or "works cited" section (and you were asked to create one), you will lose points
    - If your citations are not presented in a standard format, you will lose points

Spelling and grammar ALWAYS count

- Points will be automatically deducted from your grade if there are *excessive* and *serious* spelling, grammar and/or writing deficiencies.

- What counts as “excessive”? This varies by assignment, but my general rule of thumb is that the number of serious mistakes should not exceed the number of pages of that assignment. For example, if you are submitting a 2 page paper, any more than 2 serious errors could lead to a reduction in your grade.
- What counts as “serious”? Again, there is no hard and fast rule, but here is how I break down categories of “spelling/grammar/writing issues”
-
    - Sentence is grammatically incorrect or awkward. Usually requires reshuffling words.
      Example: “The next goal Braun et al. (2007) acts on is when and where did race become so important in health.”
    - Sentence is unclear but I have some idea what writer is trying to say
      Example: “The residential concentration of Asian Americans is very typical, and marinating the inequality of socioeconomic medical care between these neighborhoods when compared to the whites’ is an important factor for continuing the gap.”
    - Sentence is unclear and I have little or no idea what writer is trying to say
      Example: “Categories of race that define illnesses came into medical research with the intention to arrange full racial formation in clinical trial.”

Class Attendance and Participation

Your class attendance and participation will be scored using the rubric in the table below. There are 12 points in total in the table, which after I multiply by 10/12 will represent 10% of your course grade.

	Strong work (3)	Needs development (2)	Unsatisfactory (1)
Active listening (3 points)	Actively and respectfully listens to peers and instructors; consistently engaged and focused.	Sometimes displays lack of interest; not entirely engaged throughout the session; occasionally checks email, instant/text messages or other non-course material during class time.	Projects lack of interest during class; apparent visible clues that s/he is not listening to peers or instructors; frequently checks email, instant/text messages or other non-course internet material during class time.
Preparation (3 points)	Arrives to class with questions about reading assignments; active involvement in the lab sessions, clearly demonstrating that s/he has read/thought about the material	Sometimes arrives unprepared or with only superficial preparation for the lab sessions	Exhibits little evidence of having read or thought about assigned material
Quality of contributions to class discussions (3 points)	Comments and asks pertinent questions frequently. Expresses thoughts clearly.	Comments and questions sometimes advance the discussion, but sometimes do little to move it forward	Thoughts are not expressed clearly; comments are often off topic; or student does not participate in class discussions
Attendance	Arrives in class on	Usually arrives in class	Arrives consistently late,

(3 points)	time, does not have unexcused absences, and ≤ 2 absences	on time; ≤ 2 absences, but only sometimes informs instructors about unavoidable absences.	and/or does not inform instructors about absences, or > 2 absences.

* adapted from: http://www46.homepage.villanova.edu/john.immerwahr/TP101/EvDay/discussion%20rubric.pdf. Accessed on July 21, 2010

Absence, Lateness, and Early Exit

- Please note that assignments and exams are based in part on class lectures
- Students are expected to attend the full duration of ALL class sessions. It is advised that you inform me of any emergencies or long-term illnesses or other circumstances as soon as possible
- If you are absent for a class, or miss any part of it due to lateness or early exit, it is **your responsibility** to contact a classmate for notes on any material covered in class, and to complete any work that is due for the next class. "I wasn't here" is not an acceptable excuse!
- You are expected to arrive on time for class. If you arrive late to an exam or other activity, you will have until the end of the allotted period to finish (i.e., no extra time will be granted). The same policy applies for leaving class early. No students may begin an exam or other activity after another student has completed/turned in an exam
- You may NOT make-up any exam assignment, report, papers or in-class activity that you missed, unless there is a valid serious reason, documented by a police report, physician's note, court stipulation or death certificate.

Professional Conduct

- Professional development constitutes a tremendous proportion of your professional degree career and this class in particular. Please treat this class as if it were your "real" job. This includes formal correspondence via email (i.e., "Dear Professor Greenberg…"), proofread and spell-checked work (including emails), professional presentation and demeanor during class time. Please sign your emails and avoid using abbreviations and slang in all work

Writing and Preparation

- It is critical that your writing be clear and commensurate with professional level writing. The Library maintains a collection of links to sites that can assist you with proper citation format and paraphrasing and quoting other authors at http://library.brooklyn.cuny.edu → Research & Writing Help. The Learning Center has writing tutors available to help you with your writing http://lc.brooklyn.cuny.edu . The department of Health & Nutrition Sciences has a writing tutor.
- As a graduate student, you are expected to spend at least 3-5 hours per course credit, per week, doing course-related work. As this is a 3-credit class, you should anticipate spending 12-15 hours/week outside of class time doing work for this course. Please plan appropriately
- All written work must conform to assignment instructions, including the specified format, or points will be deducted.

Email Correspondence

- I will respond to quick questions via email, however if you have a more substantive issue to address you MUST see or call me during office hours
- Please check your email daily
- When sending me an email, ALWAYS put "HNSC 7120 - [Your name]" in subject line so that I know who the message is from

- Email is a *formal* means of communication in the context of school or work; please sign every message at the bottom, use polite language, capital letters, punctuation, greetings and salutations. Please avoid abbreviations, slang and cuteness

IMPORTANT: Please do not expect an immediate response when you email me. During the week I will generally respond to an email within 2 business days. If you email me on a Friday afternoon the soonest I will get back to you is early in the following week

Other Classroom Rules

- Use of cell phones and other electronic media is not permitted.
- Respect others, including their opinions (you do not have to agree, but you should show respect), and their skill levels

NOTE: You will be asked to leave the classroom if you break any of these rules and your class participation grade (10% of your final grade) will be penalized

SECTION 3. INSTITUTIONAL POLICIES

University's Policy on Academic Integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: http://www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation. **A copy of the Faculty Action Report is appended to this syllabus. I WILL report ALL instances of cheating, plagiarizing, or any other type of academic dishonesty.**

> **IMPORTANT:** A number of the assignments due in this course must be submitted on Blackboard through SafeAssign, an anti-plagiarism tool.

Center for Student Disability Services

In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with Valerie Stewart-Lovell, Director of the Center for Student Disability Services, at 718-951-5538. If a student is already registered with the Center for Student Disability Services, the student should provide the professor with the course accommodation form and discuss the specific accommodation with the professor.

> **IMPORTANT:** For more information on college-wide regulations governing grading, attendance, grade appeals, and other important matters, please see the "Academic Regulations and Procedures" section of the Brooklyn College Graduate Bulletin.

SECTION 4. PRELIMINARY CLASS SCHEDULE

As you go through this schedule, please remember:

1. This schedule, including assigned readings and due dates, is **SUBJECT TO REVISION** throughout the semester.
2. **ALWAYS** bring your readings, homework assignments and calculator to class.

3. You are responsible for **ALL** readings assigned for this course, even if they are not discussed in class.
4. Unless noted, all written assignments must be uploaded to SafeAssign in Blackboard in order to be considered submitted.

Session	Date	Lecture	Workshop / Exams	Readings and Assignments
1	2/2	Introduction/Historical Epidemiology	Lab 1: Intro to Epidemiological Databases	Gordis, Chap 1
2	2/16	Surveillance & Morbidity & Mortality Measures	Lab 2: Measures of Disease & Direct Age Adjustment	Gordis, Chap 3 & 4.
3	2/23	Infectious Disease Epidemiology	Lab 3: Outbreak investigation & Critique Wade on Gene Drives	Gordis, Chap 2 **Epi Paper Topic**.
4	3/1	Case reports, Case series, Cross-sectional & Ecological studies. Prognosis	Lab 4: Case Series & Cross-sectional & Ecological Studies	Gordis, Chap 6 & p 140 & 208-212
5	3/8	Case-Control study design	Lab 5: Case-control Studies	Gordis, Chap 10 & p 220-222 **Epi Paper Draft.**
6	3/15	Cohort study design	**MIDTERM**	Gordis, Chap 9 & 13.
7	3/22	Clinical Trials study design	Lab 7: Analyze and interpret clinical trials data	Gordis, Chap 7 & 8.
8	3/29	Interpreting measures of risk	Lab 8: Critique Golomb et al., on Chocolate & BWT I	Gordis, Chap 11 & 12.
9	4/5	Bias, Confounding, Mediation, Interaction	Lab 9: Confounding & Stratified analysis	Gordis, Chap 15
10	4/12	Causation	Lab 10: Critique Greenberg & Buijsse, on Chocolate & BWT II	Gordis, Chap 14
11	4/19	Genetic vs Environmental Causation	Lab 11: Critique Corder et al., on Alzheimer's Disease	Gordis, Chapter 16 **Epi Paper Final.**
12	5/3	Screening	Lab 12: Evaluating a screening test	Gordis, Chap 5 & 18.
13	5/10	Ethics & Genetic Engineering		Gordis, Chap 20 & Wade, NY Times 12/21/15
14	5/17			**Epi Paper Presentations**
15	5/24		**FINAL**	

Department of Health and Nutrition Sciences, Brooklyn College

Brooklyn College MPH Program, The CUNY School of Public Health

HNSC 7120X
Fundamentals of Epidemiology
Section ET6B
Code: 74455
Spring 2016

Course Description
Apply principles and methods of epidemiological analysis. Identify and interpret epidemiological data. Illustrate and investigate incidence, distribution, determinants and control of disease.

Pre-Requisites
N/A

Objectives of Course
The course will provide an introduction to basic epidemiologic concepts, terms, methods and numeric measures. By the end of the semester students should be able to explain basic epidemiologic terminology and definitions; describe study designs; understand, calculate and interpret epidemiology measures; interpret and critically examine published epidemiologic studies; comprehend ethical issues in epidemiology.

Course Meets Tuesday, 6:30-9:00 PM, 329 Ingersoll Hall Extension

Instructor Ruth McChesney, PhD, MPH

Email ruthmc@brooklyn.cuny.edu

Office Room 4200 Ingersoll Hall

Office Hours and Phone Number Tuesday 5:30 - 6:30 p.m.
Other appointment times can be set up as needed.
(718) 951-5000 Ext 2757

Required Textbook Gordis, L. Epidemiology, Fifth Edition, Elsevier Saunders, 2014.

Attendance and Class Participation

You are expected to attend all class meetings. Attendance at lectures is required for satisfactory completion of the course requirements. If you will not be able to attend, please notify the instructor as soon as possible. Please arrive on time for meetings. If you are absent please make contact for any material covered in class, and to complete any work that is due for the next class. For all assignments, please submit in a timely manner. Please see the Brooklyn College Bulletin for details about the New York State Education Law regarding nonattendance because of

religious beliefs. Normal, respectful etiquette is expected. Professional conduct is expected in interpersonal interactions, both for in-class and email communications.

Course Requirements and Grading:

The topics and lecture material for the course are mainly based on the recommended textbook. Other supplementary material will be included as appropriate, and made available to students. It is recommended that you have access to the required textbook. Additional handouts will be given out in class.

A calculator is needed for the course. When appropriate, use of the computer will accompany some of the topics as part of the classes. Computer use will not be included in the examinations.

Assignments need to be handed in by the indicated dates. Each assignment will be checked and returned. Satisfactory completion of the assignment by the indicated date will give you full credit for the assignment. The completion of other in-class exercises will be considered to contribute to class participation. There is no resubmission of assignments.

Assessment

The cumulative grade for the course will be based on the midterm examinations, a final examination, the assignments and class participation. Students should not expect to be offered make-ups for missed examinations. For an absence from an examination, a prompt communication is expected as the situation permits. For an absence from the final examination please see the Brooklyn College Bulletin.

The final grade will be determined by demonstration of knowledge and performance during the course, as indicated below. The class distribution will also be considered, if necessary.

Determination of Final Grade

	% of final grade
Midterm Examination I (1 hour)	10%
Midterm Examination II	25%
Final Examination	30%
Assignments	25%
Class Participation and Discussion	10%

Grading scale

97-100=A+	87-89=B+	77-79=C+	Less than 73=F
93-96=A	83-86=B	73-76=C	
90-92=A-	80-82=B-		

As stated in the Brooklyn College Graduate Bulletin, students in the MPH program must receive a grade of B or better in HNSC 7940 and may take the course a maximum of two times; Note that there is no grade of D in any of the graduate programs at Brooklyn

The University's Policy on Academic Integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: http://www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

Student Disability Services

In order to receive disability-related academic accommodations students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms Valerie Stewart-Lovell at (718) 951-5538. If you have already registered with the Center for Student Disability Services please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Important Dates

Thursday, February 4	Last day to add a course
Tuesday, February 9	Conversion Day: Classes follow a Friday Schedule
Monday, February 15	Last day to apply for Spring (June 1) 2016 Graduation
Thursday, February 18	Last day to drop a course without a grade
Friday-Saturday April 22- 30	Spring Recess
Monday, April 11	Course withdrawal period ends

Brooklyn College Learning Center

Help may be obtained through the Brooklyn College Learning Center http://lc.brooklyn.cuny.edu

Information For MPH Students

Program Competencies **This course will help you to achieve the following competencies, which are expected of all MPH graduates.**	**Course Learning Objectives** **After successfully completing this course, you are expected to be able to:**	**Assessment Methods** **Attainment of program competencies and learning objectives will be assessed with the following methods**
Apply the public health core functions of assessment, policy development and assurance	• Describe in writing the purpose of surveillance and how surveillance is used in public health practice • Explain the difference between incidence and prevalence • Describe the process of identifying and testing potential targets of intervention and give examples of effective and ineffective public health interventions • Describe the process of identifying vulnerable sub-populations, and give examples • Describe under what conditions screening is appropriate	• Midterm Exam I & II • Final Exam • Assignments
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe epidemiological studies, including observational, quasi- experimental and experimental studies • Differentiate between primary and secondary data collection and identify possible sources of secondary data • Explain the difference between correlation and causation; risk factors/predictors and causes • Describe the causal inferences which can be made from experimental, quasi-experimental and observational studies using published examples	• Midterm Exam I & II • Final Exam • Assignments • Class participation & discussion
Adhere to ethical and social justice principles and standards	• Describe circumstances in which an experimental study would and would not be ethical • Describe major disparities in life expectancy nationally and globally	• Assignments • Class participation & discussion
Interpret and analyze public health literature and apply evidence-based research	• Access and use published data to accurately describe in writing the health of	• Midterm Exam I & II

	populations and factors that affect health in terms of person, time and place characteristics • Distinguish between narrative and systematic reviews • Systematically review the literature on a specific topic using a PICO question	• Final Exam • Assignments
Apply basic statistical and informatics techniques	• Explain in a few sentences the principle of screening • Define lead time and length bias and how these biases may impact screening program evaluation • Describe in a few short sentences sensitivity, specificity, positive predictive value and negative predict value of a screening test compared to a gold standard test • Calculate and interpret a mean, a proportion, a rate and an odds ratio, • Explain the difference between relative and absolute risk • Calculate age-standardized rates	• Midterm Exam I & II • Final Exam • Assignments
Communicate public health information through oral, written, digital and visual presentation	• Describe the validity, utility and feasibility of tests used for screening and diagnosis of health conditions • Present visually information on key public health topics such as the major causes of death nationally and globally	• Assignments • Class participation & discussion
Design and evaluate interventions to prevent or control public health problems	• List the strengths and weaknesses of different techniques for evaluating interventions • List the strengths and weaknesses of different techniques for controlling public health problems	• Assignments
Collect, analyze and interpret public health data	• Explain how to choose and apply appropriate study designs to answer a research question • Explain the interpretation of different measures of population health, such as life expectancy, quality adjusted life years	• Midterm Exam I & II • Final Exam

HNSC 7120X Fundamentals of Epidemiology
Syllabus Spring 2016

Week	Date	Topics	Textbook Chapter Gordis	Assignment Due
1	2/02	Introduction to Concepts and Methods in Epidemiology	1, 2	
2	2/09	No Class		
3	2/16	Morbidity & Mortality Quantitative Measures Sources of Data Surveillance	3, 4, 6	
4	2/23	Hypothesis Generation and Testing Models of Causation	1	1
5	3/01	Descriptive Epidemiology: Person, Place, Time.	1, 2	2
6	3/08	**Midterm Examination I (1 hour)**		
		Analytical Epidemiology: -Observational Study Designs -Ecologic Studies -Cross-Sectional Studies	9, 10 13 10	3
7	3/15	-Case-Control Studies	10,13	4
8	3/22	-Cohort Studies. -Retrospective/Historical Studies -Prospective Studies	6, 9,11,12,13	5
9	3/29	Survival Analysis Experimental Study Designs -Randomized Controlled Trials	6 7,8	6
10	4/05	Interpretation of Studies -Error, Bias, Confounding, Interaction Effect modification -Causal Criteria Review for Midterm Examination	14,15,19 14,15,19 14	7

Week	Date	Topics	Textbook Chapter Gordis	Assignment Due
11	4/12	**Midterm Examination II**		
12	4/19	Screening Evaluation of Screening Programs	5 18	8
13	4/26	No Class		
14	5/03	Analysis of Published Epidemiologic Studies		
		Infectious Disease Epidemiology	2	9
		Chronic Disease Epidemiology		
15	5/10	Topics in Epidemiology - Genetics in Epidemiology - Environmental and Occupational Epidemiology - Nutritional Epidemiology	16	10
		Epidemiology and Health Services	17	
16	5/17	Epidemiology and Public Policy	19	
		Ethical Issues in Epidemiology	20	
		Review for Final Examination		
17	5/24	**Final Examination**		

CUNY SCHOOL OF PUBLIC HEALTH

Fundamentals of Environmental Health - Spring 2016

Course Number/Class Section	HNSC7130X/EW6 Fundamentals of Environmental Health
Course Meeting Day/Time	Wednesday - 6:30 to 9:00 PM
Location	Ingersol Extension, Room 238
Instructor	Singh, Supy, MA
Office	4123 Ingersol Hall
Phone	718-951-5026
E-Mail	Subraham.Singh@brooklyn.cuny.edu Please put "HNSC7130" in the subject field
Office Hours	Available before or after class or by appointment
Text (Recommended)	Environmental Health: From Global to Local (2nd ed.) by Howard Frumkin, San Francisco, CA: John Wiley & Sons, Inc; 2010.

I. Course Description

Environmental health consists of various aspects of public health issues as it relates to physical, chemical, biological, social and psychological, economic, and political factors affecting vulnerable population. It plays a key role with respect to theory and practice of assessing and controlling in the environment that may potentially impact human health. This is a survey based course aimed at to examining the environment impact of the shifting trends at the local and global level including urban development and land use, air pollution, water quality, resource management, climate instability, solid waste management, environmental justice, and technological development of the urban infrastructure (e.g., housing, transportation, sewage and waste disposal). The impact of the changing trends and shifts in policies for abating environmental health problems will be assessed and developed during the course discussions and assignments. This course will help students facilitate the following:

- Identify the various factors and other trends that are and will be impacting urban environmental health landscape in the 21st century;
- Analyze the impact of these shifting trends and policies on the public health of vulnerable populations;
- Identify technical, economic, and political strategies at multiple levels for mitigating environmental health problems that is essential to human health and environmental quality;
- Assess and evaluate the effect of environmental health hazards in the urban environmental landscape; and,
- Provide a more concise and thorough understanding of the impact of environmental hazards on the health of urban populations, and strategies for mitigating and preventing.

II. Assessment

Grading for the course will be based on a scale. Due dates for examinations and assignments are noted in the course schedule section of this syllabus. Extensions for exams are not available unless planned with the professor well in advance of day the exam is distributed or the assignment is due. Your understanding of the course material will be evaluated though three short writing assignments, two short oral presentations, class participation, two examinations, and a term paper

Grading:

	Activity	Due
5%	Short Assignment 1-Causes and consequences	February 10
5%	Short Assignment 2-Climate change	February 24
5%	Short Assignment 3-Risk Assessment	March 9
5%	Class Participation	Throughout the Semester
5%	Presentation 1-Emergent Environmental Health Issue in the News	Throughout the semester
5%	Presentation 2-Environmental Health consultant	Throughout the semester
20%	Mid-term examination	March 30
20%	Final examination	May 25
	Research Paper on an Environmental Health Topic:	
5%	Topic/Annotated bibliography	March 16
20%	Draft term paper	April 20
	Final term Paper	May 18
5%	Oral or poster presentation	May 18
100%		

Letter Grading:

A	≥ 93%
A	92 -90%
B+	87 -89%
B-	83 -86%
B	80 - 82 %
C+	77- 79%
C	73 -76%
C-	70 -72 %
F	< 70%

The grading criteria for the course are as follows:

1. Class Attendance and Participation. (5%) Students are expected to attend class regularly, show up on time, participate actively, and be prepared to discuss readings and other assignments.

2. 3- Short related writing assignment (15%): Short related written assignments are from 1-2 pages in length focusing on key concepts illustrated during class discussion and supported by the reading assignments. Information about the short assignments will be posted on Blackboard in the Assignment tab and reviewed in detail the week before the assignment is due.

First Short Written Assignment (5%) (February 10):

Second Short Written Assignment (5%) (February 24):

Third Short Written Assignment (5%) (March 10):

3. 2-Presentations (10%):

1. Emergent Environmental Health Issue in the News (5%)
Presentation 1 allows you, as a student, to introduce emergent environmental health issue of your choosing. A semester schedule for the Environmental Health in the News will be developed starting with week 2. During the course of the semester, the 2-3 students scheduled for that week will each provide a short presentation on an environmental health story of their choosing. The stories should be taken from the publicly available credible news media outlet. A subsequent supporting scholarly article on the issue should be acquired.

Guidelines for your oral presentation on Emergent Environmental Health Issue in the News
1. Prior to class, find a story that you find important and of interest to you.
2. Prepare a Powerpoint presentation with a maximum of three (3) slides that include the following

Slide 1:

- One sentence statement of the nature of the environmental health story
- Citation for your environmental health story with title and URL (or written reference). The citation should be in AMA format.

Slide 2:

- Additional information that explains the situation.

Slide 3:

- A citation of a peer reviewed source that is relevant for your news story. The citation should be in AMA format.
- A statement saying about the findings of the paper.
- A statement saying how the peer review source relates to your news story.

A template for the Powerpoint presentation can be found in the "Environmental Health in the News folder" in the assignments tab.
3. Come to class 10 minutes early (6:20) to upload your Powerpoint.
4. Deliver your presentation to the class—you'll have 5 minutes with 3 minutes for questions.
5. You cannot read your presentation.
6. Your grade will be based on your how well you convey emergent environmental health issue in the news.
7. Additional guidelines can be found in the "Environmental Health in the News" folder.

Scheduling Ground Rules: Due to the size of the class, changes in scheduling are not encouraged. A copy of the presentation schedule will be posted on Blackboard.

2. Consulting on Environmental Health Policy (5%)
Presentation 2 consists of the assignments of an environmental health topic to present to the class 2-3 minutes. A semester schedule for the Consulting on Environmental Health Policy will be developed starting with week 2.You will acquire a peer-reviewed journal on the subject matter and come to class prepared to summarize, answer questions from myself and

other students and to discuss topic, policies associated with the topic, and mitigation and interventions as needed.

3. Mid-term (20%): The mid-term exam will consist of some combination of essay and short-answer responses covering key concepts from the course sessions and selected readings. Mid-term exam scheduled for *March 30*.

4. Final Exam (20%): The final exam will also consist of some combination of essay and short-answer responses covering key concepts from the course sessions and selected readings. The format will be multiple choice, short answer, and essay questions. Final exam scheduled for *May 25*.

5. Research Paper (30%): The purpose of this research paper is for you to demonstrate key concepts illustrated in the readings and class sessions and to practice clear and concise writing and proper citation format. You'll write an 8-10 page research paper using at least 8-10 peer reviewed sources.

There are three types of paper from which you can choose from:

- The "Description and verification" paper topics ask you examine the evidence of the environmental-relatedness of your topic (either a chemical or illness).
- The "Ranking and analysis-risk assessment" papers should be modeled on the EPA's risk assessment guidelines which means you will need to assess both the magnitude of exposure and the health effects of chemical. Using this information, you will make an inference as to whether the situation is one where a person's health could be at risk. Then, you will critically describe a policy that addresses the hazard.
- The "Policy" papers ask you to identify the information needed in order to formulate policy recommendations.

At a minimum the paper should include but not limited to following subject areas:

- **Introduction:** Clearly identify the environmental health issue and its impact, describe the public health significance of the problem, the objective of the paper, and the position you are taking with respect to the problem;
- **Discussion:** Detail description of the history and the current status of the environmental health problem, what is the cause or is causing the problem? What is the evidence base for the problem? Use examples from reference materials to cite support your agreement. What are the adverse health conditions the problem is causing?
- **Population and Setting:** Identify the location and population that is being impacted the most by this environmental health problem;
- **Prevention/Intervention Strategies:** Include the strategies on abating the problem, include a theoretical framework for your intervention, describe how you would implement the intervention including barriers that may hamper the implementation; and,
- **Conclusion:** Summarize the problem, your position on the problem, policy and practices that can potentially mitigate the problem, areas for future research.

Formatting of written assignments:

- Title page;
- 8-10 pages in length;
- Times New Roman, 12pt font;
- Double spaced;
- 1-incg margins;
- Page numbers;
- At least 8-10-peer reviewed references should appear on a separate page; and,
- APA/MLA citation style.

Research Paper Submittal: There will be three submission dates to remember.

a. **Thesis/Topic/Annotated Bibliography:** (5%): Describe the environmental health issue of interest that is significantly impacting or will be impacting public health of a population in urban environment. The annotated bibliography should include 8-10 references pertaining to your selected topic. Your topic and annotated bibliography which will be due on *March 16*.

b. **Presentation:** (5%) Each student will give a presentation of no longer than five (5) minutes, including some questions based on time limitations. The presentation will be a discussion of the student's final paper, supporting evidence, analysis and conclusion. The presentation may not be read although you may use Powerpoint (provided you don't read the slides!).

   The Powerpoint if used should highlight and expand the impact of your presentation and not simply substitute for notes. As such a thorough use of graphical or visual enhancements can be productive means of conveying key information to your audience. The presentation will be graded for the accuracy of content, organization, and effectiveness in conveying the topic. Presentations will occur on *May 18.*

c. **Research Paper Submittal** (20%)**:** The term paper will have two due dates. If you submit the draft research paper on or before April 20, it will be returned to you on May 4 and you'll have an opportunity for revision.

   Submission by the first deadline (April 20) is highly recommended. All term papers, whether revised or not will be due on *May 18*, the day of the class presentation. Papers submitted after class time on *April 20* will be accepted without the revision option.

III. General Information and Policies

Class participation

Success in the course depends on preparation, participation, and engagement. Students should attend class, do the readings, be prepared to initiate and participate in class discussions, prepare oral presentations, collaborate with other students, and submit assignments by their due date. The focus of this course is to produce a supportive and inclusive learning environment that

facilitates the exchange of ideas and thought from all students through discussion while maintaining mutual respect.

Lateness & Absences
Attendance is mandatory and will be taken every day at the beginning of class. The course consists of a total of 15 sessions so timely and regular attendance is essential. Therefore, if you do have to miss class due to exceptional circumstances, please make arrangements to get notes from a classmate and to meet me to go over the notes once you have had a chance to read them.

Late submission of assignments
All assignments are expected to be submitted via hardcopy or Blackboard on the due date. Assignments are not to be submitted by e-mail unless you are specifically requested to do so.

Assignments handed in after the due date without prior permission will have points deducted. If you anticipate the need to turn in work late, please contact me to negotiate a mutually acceptable submission plan in advance of the assignment's due date. Please do not ask for an extension on the due date of the assignment.

Class citizenship & rules of conduct
Cell phones: Please refrain from using cell phones during the class unless specifically instructed to do so. If you have a situation where it is necessary to take a call, please step outside.

Plagiarism and Academic Misconduct
The best learning is done in conversation with others, whether they are people—classmates, teachers, friends—or texts—books, articles, essays, poems, films etc. It should not be a solitary process. However, the assignments that you hand in for this course must be done on your own, should represent your own thinking, and should be original work that you have done for this particular course. The best way to balance these two seemingly contradictory approaches (collaborative learning and original individually-produced work) without knowingly—or, even unwittingly—resorting to plagiarism or other forms of academic misconduct is to learn and meticulously observe the rules for citing the work of others. It is **your** responsibility to learn what constitutes plagiarism and the correct rules for citing sources—read the information on the following website carefully: http://www.brooklyn.cuny.edu/bc/policies/.

Center for Student Disability Services
In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services (CSDS). Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with Valerie Stewart-Lovell, Director CSDS, at 718-951-5538. If a student is already registered with CSDS, the student should provide the professor with the course accommodation form and discuss the specific accommodation with the professor. Per College policy, students are not permitted to bypass CSDS and go directly to a faculty member to request accommodation. Faculty members are not permitted to grant an accommodation without receiving the *Verification of Disability and Course Accommodations* forms from CSDS. Please note that, in addition to chronic conditions, many students who are dealing with acute or short-term health issues may be eligible for accommodation

The Library maintains a collection of links to sites that can assist you with proper citation format and paraphrasing and quoting other authors at http://library.brooklyn.cuny.edu→ Research & Writing Help. The Learning Center has writing tutors available to help you with your writing http://lc.brooklyn.cuny.edu/.

Incomplete Grade Policy
A grade of Incomplete (INC) may be given at the discretion of the instructor when 1) a student has satisfactorily completed most, but not all, course requirements, and 2) a student provides to the instructor evidence documenting the extenuating circumstances that prevent the completion of course requirements by the end of the semester. The instructor may change the grade of INC to another grade when the work has been completed. An INC grade may also be given at the discretion of the instructor when 1) a student has been fulfilling course requirements but is absent from the final examination, and
2) A student provides to the instructor evidence documenting the extenuating circumstances that prevent the taking of the scheduled final examination. The instructor may change the grade of INC to another grade after the final exam has been taken.

Grade appeals
You have the right to appeal a grade with which you disagree. For details, please go to:
http://www.brooklyn.cuny.edu/pub/pdf/departmental_grade-appeals.pdf

Brooklyn College Graduate Policies
For additional information on Brooklyn College policies governing graduate students, please consult the Graduate Bulletin which can be found at:
http://www.brooklyn.cuny.edu/web/off_registrar/2015

Course Communication and Assignment Submission
This course is, in part, delivered using the Blackboard course management system. In addition, students may be required to submit course assignments from time to time to the instructor "electronically" using Brooklyn College e-mail or Blackboard. An active Brooklyn student e-mail user ID and password is required to log into both systems. An active CUNY e-mail ID is required for non-Brooklyn students taking the class. All students are issued a free e-mail account when registering for classes for the first time. Blackboard and Brooklyn e-mail will be used for communicating with the instructor, for receiving some supplemental course materials, and for submitting assignments. It is the responsibility of the student to remain current on this system.

Email Correspondence
Announcements, changes in the syllabus, reminders about tests or due dates etc may be sent out via email is necessary. It is your responsibility to check e-mail regularly to keep up-to-date with these announcements. I will use the e-mail address you have provided, so please make sure that this is indeed the correct address and you are receiving email correspondences.

- Check your email daily; and,
- ALWAYS PUT <yourname> AND <class title> IN THE SUBJECT (HNSC7130) so I know who the message is from. You may want to consider using your Brooklyn College email for school work – you can access it in the BC WebCentral Portal http://portal.brooklyn.edu

Readings and assignments
As indicated above the **recommended** text ***for*** the course is Environmental Health: From Global to Local (2nd ed.) by Howard Frumkin. Supplemental readings will also be posted on BlackBoard/provided via email for students.

Assignments must be named using the following formulae when submitted:

HNSC7130 StudentLastName_StudentFirstName_AssignmentID
HNSC7130 StudentLastName_StudentFirstName_Assignment ID

Papers (and paper related assignments) will not be graded for students who do not name files according to instructions.

Assignments are due by class time on the day indicated in section on grading policies. For course discussion purposes, you may also be asked to bring paper copies of your assignments to class.

Syllabus Change Policy
Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. Changes to the syllabus will be communicated in class/Blackboard/ via email if deemed necessary.

Important Dates

Thursday, February 4 Last day to add a course

Tuesday, February 9 Conversion Day; Classes follow a Friday Schedule

Monday, February 15 Last day to apply for Spring 2016 Graduation

Thursday, February 18 Last day to drop a course without a grade

Wednesday, March 23 Conversion Day: Classes follow a Friday Schedule

Monday, April 11 Last day to withdraw from a course with a W (non-penalty) grade

Monday, May 2 Last day to resolve Fall 2015 and Winter 2016 incomplete grade (INC)

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COURSE SCHEDULE				
Session	**Date**	**Topics**	**Readings for Session**	**Assignments Due For Class**
Session 1	February 3, 2016	Introduction to Environmental Health Ecology and Environmental Health Principles and Processes Healthy Communities Emerging Environmental Health Issues	Chapter 1-Ecology and Human Health Chapter 11 –Developing Nations Chapter 14 – Healthy Communities	
Session 2	February 10, 2016	Environmental Health Policies Environmental Justice Environmental Intervention and Prevention	Chapter 27-Environmenatl Health Practices Chapter 26 –Prevention in Environmental Health Chapter 8 –Environmental Justice Chapter 30-Environmental Health Policy	First Short Asignment
Session 3	February 17, 2016	Industrialization Globalization Population Pressure Climate Instability Global Warming	Chapter 9-Population Pressure Chapter 10- Climate Change	3-Students Presenting on Emerging Environmental Health Issues 3- Students Consulting Environmental Health Policies
Session 4	February 24, 2016	Physical Environment Technological development of the urban infrastructure (e.g., housing, transportation, sewage and waste disposal) Green Initiatives/LEED	Chapter 14 – Healthy Communities Chapter 19 –Healthy Buildings	Second Short Assignment 3- Students Consulting Environmental Health Policies 3-Students Presenting on Emerging Environmental Health Issues

Session 5	March 2, 2015	Water Quality and Health Sanitation	Chapter 15 –Water and Health	3-Students Presenting on Emerging Environmental Health Issues 3- Students Consulting Environmental Health Policies
Session 6	March 9, 2015	Air Pollution/ Energy Production	Chapter 12 –Air Pollution Chapter 13 – Energy Production	3-Students Presenting on Emerging Environmental Health Issues
Session 7	March 16, 2015	Toxicology/ Risk Assessment/ Exposure Assessments	Chapter 2- Toxicology Chapter 3 -Epidemiology Chapter 4 –Exposure Assessment Chapter 6 –Genetic and Environmental Health Chapter 29-Risk Assessment	Thesis Topic/Annotated Bibliography 3-Students Presenting on Emerging Environmental Health Issues 3- Students Consulting Environmental Health Policies
March 23, 2015 No Class –Conversion Day (Classes Follow a Friday Schedule)				
Session 8	March 30, 2016	Environmental Disasters (Natural/Anthropogenic)	Chapter 23 –Environmental Disasters	**Midterm Exam**

Session 9	April 6, 2015	Solid/Hazardous Waste Management (landfills, RCRA, CERCLA, Superfund Sites)	Chapter 16 –Solid and Hazardous Waste Management	Third Short Assignment 3-Students Presenting on Emerging Environmental Health Issues 3- Students Consulting Environmental Health Policies
Session 10	April 13, 2016	Children Environmental Health Hazards (PCBs/Pesticides/Lead)/ Persistent Organic Pollutants	Chapter 17 –Pesticides Chapter 25-Children	3-Students Presenting on Emerging Environmental Health Issues 3- Students Consulting Environmental Health Policies
Session 11	April 20, 2016	Occupational Health and Safety Work Place Accidents and Injuries	Chapter 20-Work Place Health and Safety Chapter 22 -Injuries	Draft of Research Paper 3-Students Presenting on Emerging Environmental Health Issues 3- Students Consulting Environmental Health Policies
April, 27, 2016 Spring Recess – No Class				
Session 12	May 4, 2016	Radiation Vector Borne Illnesses	Chapter 21 - Radiation	6- Students Consulting Environmental Health Policies

Session 13	May 11, 2016	12-Student Presentations	Oral and Poster Presentations Final Research Paper
Session 14	May 18, 2016	11-Student Presentations	Oral and Poster Presentations Final Research Paper
Session 15	May 25, 2016	**Final Exam**	

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you achieve increased competency in health care policy and administration. By the time you graduate, you should be able to:	After successfully completing this course, You are expected to be able to:	Competencies and learning objectives will evaluated by the following assessment methods:
Apply the public health core functions of assessment, policy development and assurance	Describe approaches for identifying and assessing the human and ecological impacts of workplace and environmental hazards	Open forum discussion during all courses sessions
Apply theories, concepts, models and methods to the design of public health research, policy and practice	Explain the importance of working collaboratively with diverse communities, sectors, and constituencies in the development, implementation, and evaluation of workplace and environmental health programs and policies. Describe the elements, appropriate use and limitations of key risk assessment, risk management and risk communication strategies	Cass discussion
Apply basic statistical and informatics techniques	Use informatics techniques to retrieve, analyze and summarize environmental health data Use spreadsheet applications to collect and graphically represent data	Three class presentations 1.emergent environmental health issues in the news, 2. students panel discussion consulting on environmental health policy, 3. final research paper presentations oral /posters
Communicate public health information through oral, written, digital and visual presentation	Describe common strategies and their limitations for controlling workplace and environmental hazards	Open forum class discussion throughout the semester during all courses sessions
Explain how social, behavioral, biomedical and environmental determinants affect population health	Understand the basic mechanisms of toxicity and pathobiology Describe the genetic, physiologic, psychosocial factors that affect susceptibility to adverse health outcomes following exposure to workplace and environmental hazards Explain the reasons, sources, and impacts of inequitable	Discussion during course sessions 2, 4, 5, 7, and 11

	distribution of environmental hazards	
Design and evaluate interventions to prevent or control public health problems	Describe common strategies and their limitations for controlling workplace and environmental hazards	This will be facilitated throughout the semester during all courses sessions
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	Identify the accomplishments and limitations of key environmental regulatory programs, guidelines, and authorities at the federal and state level.	Discussions during course sessions 3, 5, 6, 7, 8, 10, 11, and 12

THE CUNY SCHOOL OF PUBLIC HEALTH
Brooklyn College MPH Program
HNSC 7140
Fundamentals of Health Policy and Management
[Code: 32560, Section NETA]
Spring 2016

Catalogue description	Examination of the organization, delivery and financing of health care in the United States as it pertains to the health policy-making process, including the organization of the agencies and personnel constituting the health care system, and analysis of government structure, laws, and regulations. Theoretical concepts, practice, and implementation of health programs in organized settings, including the planning, administration, management, evaluation, and policy analysis of public health agencies and private sector managed care.
Course Meets	Fully online*
Instructor	Dr. Betsy Eastwood
Email	eastwood@brooklyn.cuny.edu
Phone	718-951-5000 ext. 2755
Office	5129 Ingersoll Hall
Office Hours	Tuesdays from 3-6 PM. For other times, please email me.
Required Books	Sultz, H.A. & Young, K.M. (2013). Health Care USA: Understanding Its Organization and Delivery (8th edition), Sudbury, MA: Jones & Bartlett. ISBN-10: 128029883; ISBN-13: 978-1284029888 Bodenheimer, T.S. & Grumbach, K. (2012). Understanding Health Policy: A Clinical Approach (6th edition), New York: McGraw Hill. ISBN-10: 0071770526; ISBN-13: 978-0071770521
Other Required Materials	Assignments and additional required readings will be posted on Blackboard

*This is a fully online course. This means that, as with a traditional class, you are responsible for weekly readings and activities. Unlike a traditional class, you are expected to independently access and view PowerPoint presentations/lectures every week, and to participate in online discussion boards (DB), as well as to complete activities and take quizzes and exams online. **All weekly course materials will be made available by WEDNESDAY; weekly assignments are due by the following FRIDAY and TUESDAY nights.**

It is YOUR responsibility to successfully log onto Blackboard and successfully participate in the course throughout the semester. If you need assistance, Brooklyn College's Information Technology Systems (ITS) Help Desk can be accessed by calling 718-677-6180 (9am-5pm), emailing helpdesk@brooklyn.cuny.edu, or visiting http://dewey.brooklyn.cuny.edu/resources/?service=blackboard

COURSE OBJECTIVES

Program Competencies	Course Learning Objectives	Sessions/ Activities
This course will help you to achieve the following competencies, which are expected of all MPH graduates	**After successfully completing this course, you are expected to be able to:**	
Apply the public health core functions of assessment, policy development and assurance	• Assess the effects of political, social and economic policies on public health systems and the health of urban population's terms of effectiveness, efficiency and equity. • Discuss political and economic feasibility issues related to health policy	Sessions 2-14; DB postings
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe evidence-based approaches in the development and evaluation of public health policies and interventions • Discuss the function and role of management and the organizational structure of public health organizations • Explain quality and performance improvement concepts employed in public health organizations	Sessions 2-14; Writing Assign. 1-5
Adhere to ethical and social justice principles and standards	• Explain the difference between health care systems based on market justice and those based on social justice through a comparison of the U.S. healthcare system to global health systems.	Session 14
Interpret and analyze public health literature and apply evidence-based research	• Prepare documents for use in legislative testimony.	Writing assignments 2-5
5. -----	-----	
Communicate public health information through oral, written, digital and visual presentation	• Communicate the impact of current and potential policies to the lay public, advocacy groups and policy professionals.	Writing Assign. 1-5
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Analyze the impact of individual, organizational, community, national and global trends and interdependencies on public health related problems and health disparities	DB postings; Sessions 2-14
Engage and collaborate with diverse groups	• Explain how professional ethics and practices relate to equity and accountability in diverse community settings.	Writing assignments 2-5
9. -----	-----	
10. -----	-----	
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Describe the legal foundation of public health and the public health policy process, including the role of each level and branch of government in assuring the health of the public • Assess the main components of, and issues related to, the organization, financing and delivery of health services and public health in the US in terms of equity, access cost and effectiveness	Sessions 2-14; Writing Assign. 1, 2, 5
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Describe communication, strategic planning and marketing principles related to public health activities across different settings and audiences • Investigate the role of major stakeholders including non-	Sessions 2-14; Writing Assign. 1-2

	profit and community-based organizations in the policy process and their impact on public health	
Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Explain the basic organization, financing and delivery of health services in the U.S. • Discuss the impact of a lack of access to health care for both individuals and society • Specify the role of public health and other governmental agencies in providing access to care for the U.S. population	Sessions 2-14; Writing Assign. 1, 2, 5

PART I. COURSE COMPONENTS & ASSESSMENT

Online courses can be challenging to master in the beginning. As a first step you MUST thoroughly review both this syllabus and the other materials available in the "Syllabus & Other Course Info" folder and the "Session #1 (Orientation)" folder on BB.

Technical requirements

- Access to an Internet connection with high bandwidth for streaming video, Flash and audio
- Mozilla Firefox or Microsoft Internet Explorer Internet browsers preferred
- Microsoft Office applications (Word, Excel, PowerPoint), version 2010 or later
- ***You may NOT use a Smartphone, tablet or any other device other than a computer to complete activities such as DB posts or quizzes.***

  For technical assistance with BB: Please contact Brooklyn College Information Technology Services (ITS) Help Desk at 718-677-6180 (9am-5pm) or helpdesk@brooklyn.cuny.edu. Basic information on how to use BB, as well as full contact information for ITS, including on-campus assistance, can be found at http://dewey.brooklyn.cuny.edu/resources/?service=blackboard

Student expectations

- Students are expected to thoroughly understand all requirements, components, and procedures of this online class by carefully reviewing this syllabus and asking questions.
- Students are expected to successfully navigate the various components of Blackboard, including the Discussion Boards, assignments, and quizzes, by dedicating an adequate amount of time (well in advance of any deadlines) to exploring the site and accessing the help resources available to them.
- Students are expected to log onto the course BB site several times a week to read announcements, retrieve and view course materials, and participate in the Discussion Boards.
- Students are expected to ensure that they have reliable and timely access to an adequate Internet connection. In other words, if your home computer crashes or Internet access fails, you will be able to use a university computer or a friend's computer to access course materials, submit postings and assignments, and take exams by the stated deadline. ***"My computer or Internet crashed so I couldn't post to the Discussion Board or take the quiz"*** is not an acceptable excuse!

Assessment

The way you are assessed and graded for an online class does not differ greatly from a face-to-face class. Your grade is derived from three basic course components, which are listed below and described in detail in the table presented on the next two pages.

1. Participation (primarily from 3 weekly Discussion Board posts)……..30%

2. Weekly quizzes (14 in total) and Final Exam……..…….……35%

3. Written assignments (5 in total)……..……..35%

Component	% of Grade	What is it?	Where is it?	What else should I know?
(1) Discussion board (DB) participation	30%	• The majority of your participation grade will consist of posting to weekly discussion boards (14 sessions in total). For *each* of the 14 sessions, you should post a total of 3 posts. These posts should consist of 1 substantive original post (e.g., thread) of at least 150 words and 2 short interaction/reply posts of at least 25 words in response to other students' original posts. • Some additional online assignments will also count towards your participation grade, including providing feedback for the course in two "Feedback forums." These postings are mandatory, but graded as "pass/fail". • All original postings are due by 11:59pm on Friday, reply posts are due 11:59pm on the Tuesday at the end of session week.	• Each week's DB is located in that week's folder – so the DB for Session #1 is located in the Session #1 folder, etc.	• DB posts are formal written assignments for a graduate-level course and will be graded as if you had handed in your writing on a piece of paper (e.g., in the form of an essay or research paper). • Please see Appendix A "Writing for this Class," as well as Appendix B "Grading Rubric for Discussion Board Participation".
(2) Quizzes/ Final Exam	35%	• There will be 14 weekly quizzes throughout the semester, each worth 2% of your final grade. These quizzes are short (approximately 10 questions, usually multiple choice), timed (you have 20 minutes to complete each quiz, and you may not stop once you have started a quiz), and must be completed individually and without referring to notes or text. All quizzes are due by 11:59pm on the Tuesday at the end of session week. • The final exam is longer, and is worth 7% of your final grade. The final exam is due by the end of Session #15	• Each week's quiz is located in that week's folder – so the Quiz #1 is located in the Session #1 folder, etc. • The final exam will be located in the Session #15 folder.	• Nervous about what a timed online quiz is like? Take "Quiz #1," located in the "Session #1" folder, to get a feel for it. All students will receive full credit for this first quiz as long as they complete it on time!

Component	% of Grade	What is it?	Where is it?	What else should I know?
(3) Writing Assignments§	35%	• You will have 5 writing assignments due throughout the semester. Each assignment is worth 7% of your final grade and "builds up" to a 3-6 page policy memo on a health topic of your choice that also incorporates at least one international comparison. These assignments consist of: ➢ Writing Assignment #1: International comparisons exercise ➢ Writing Assignment #2: Policy memo topic, outline, sources ➢ Writing Assignment #3: Draft of a policy memo (3-6 pgs.). Graded as "pass/fail" -- full credit will be awarded if assignment is submitted on time ➢ Writing Assignment #4: "Double-blind" peer review of a classmate's policy memo draft ➢ Writing Assignment #5: Final submission of your policy memo and response to peer reviewer • Note that all written assignments be processed through SafeAssign, a plagiarism detection tool. • All assignments are due by 11:59pm on the Tuesday at the end of the session week in which they are due. **NO LATE WORK WILL BE ACCEPTED.** NO EXCEPTIONS.	• All assignments are in the "Assignments" folder in BB. • Unlike quizzes, lectures, and DB's, which are released on a week-by-week basis, all written assignments are available to you at least 6 weeks before the deadline (usually sooner) and may be found in the "Assignments" folder in BB. As such, you may work on most assignments throughout the semester, though there is a finite deadline for each.	• Please see Appendix A "Writing for this Class." • Anxious about SafeAssign? As your first assignment ("Sample Assignment"), you are asked to upload any college-level paper with citations to the SafeAssign link provided and to view the results. This is a Pass/Fail assignment! I will not be grading (or even viewing) the SafeAssign results; I just want you to become familiar with how the program works. You will be asked to comment on your results in Session #2's DB.

§ **I DO NOT ACCEPT EMAILED ASSIGNMENTS. EVER**. Assignments must uploaded to BB by the date and time specified. **NO EXCEPTIONS.**

Grading scale^

97-100=A+	86-89=B+	77-79=C+
93-96=A	83-86=B	73-76=C
90-92=A-	80-82=B-	Less than 73=F

^ A few notes about the grading scale:

(1) Students enrolled in this course come from many different programs and situations. For example, some students may have been admitted on a non-matriculated basis, such that earning a certain grade in this class may be a condition of matriculating. Some students are MPH students, who are required to earn at least a B in all of the 10 "core" public health courses (if this information is news to you, you should review the Brooklyn College Graduate Bulletin ASAP). Keep in mind that, as with all your instructors, I don't necessarily know who is who, so it is each student's personal responsibility to monitor their grades and their progress. Moreover, everyone is judged by the same standard, no matter what grade they "need" to get!

(2) Note that there is no grade of D in any of the graduate programs at Brooklyn College.

(3) My policy is that I do not give INC grades. NO EXCEPTIONS. EVER.

An illustration of how weekly deadlines work in this class (Note that the class week starts on WED and ends on TUES!)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			Session #2 released at 12:00am		Original 150-word DB post by 11:59pm	
		Quiz, 25-word DB replies, etc. due by 11:59pm	Session #3 released at 12:00am		Original 150-word DB post by 11:59pm	
		Quiz, 25-word DB replies, etc. due by 11:59pm	Session #4 released at 12:00am		Original 150-word DB post by 11:59pm	*And so on…*

Suggestions for a successful online experience

Time management is crucial in an online class. It is expected you will have completed all the assigned reading for each of the class sessions, and that you will join each week's Discussion Board (DB) prepared to thoughtfully read, write, and learn.

Please note that this marks a significant difference from some face-to-face courses, where you might be able to fall behind on reading and catch up before exams or papers are due without your grade being affected. Staying on schedule by doing the reading will make the class more enjoyable for you, make for a better learning experience, make for livelier Discussion Boards, and improve your grade.

I would suggest the following sequence of events for any given session:

1. "ANYTIME" ACTIVITIES: You may do these activities at any time before their due dates

- Read the textbook chapters that are due for the upcoming week. You may do this at any time, as all assigned readings from the textbooks are listed in this syllabus.

- Work on any upcoming writing assignments. Assignments are usually available in the "Assignments" folder on BB at least 3 weeks before the due date.

2. SESSION-SPECIFIC ACTIVITIES: For any given session, from Wednesday onwards you may log onto BB to access that week's materials (labeled Session #1, Session #2, etc.). You have until the following Tuesday night to:

- Retrieve additional course materials for that week's topic and view the PowerPoint lecture for that week

- Post to BB for that week, remember that the longer original post is due on Friday night, and the reply posts are due on Tuesday night, but there is nothing stopping you from posting earlier!

- Take the weekly quiz. The quizzes are based on both the textbook readings and the materials presented in each session folder. Each quiz is also due by Tuesday night at 11:59PM, but you should take it whenever you have completed reviewing the materials for that week

- IMPORTANT: *Do not wait until Tuesday night to complete the session-specific activities!*

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PART II. COURSE POLICIES

Email correspondence

I will respond to most questions via email, however if you have a more substantive issue to address please arrange to meet with me (in person or on the phone) during office hours.

When you email me, you can usually expect a response within 2 business days, but generally sooner. Do not expect an immediate response. Note that I do not respond to emails on the weekend.

Golden Rules for Email

- Keep in mind that I get many emails a day. ALWAYS put "HNSC 7140 - [Your name]" in subject line so that I know who the message is from and what it is in regard to.
- You are expected to conduct yourself in a professional manner in all of your interpersonal interactions, including in email. Email is a *formal* means of communication in the context of school or work; please sign every message at the bottom, use polite language, capital letters, punctuation, greetings and salutations. Please avoid abbreviations, slang and cuteness.
- As noted above, I do not accept assignments via e-mail.

Other forms of communication

In person: As noted above, my office hours at Brooklyn College for Spring 2016 are Tuesdays 3:00-6:00pm; please email for an appointment for those dates), or by appointment. You are always welcome to

drop by during office hours, but to avoid long waits I ask that students please make an appointment via email beforehand whenever possible.

Phone or chat: I can also make appointments to either talk with students on the phone or communicate via chat (via BB's "Collaboration") during office hours for those who cannot make it to campus on Tuesdays. Please make these appointments via email. I am rarely right in front of my Brooklyn College phone (unless we have scheduled a phone meeting), and I usually only pick up phone messages during office hours, so the phone is the least efficient way to contact me, unless you want to let me know that you are running late for a face-to-face meeting.

PART III. INSTITUTIONAL POLICIES

Brooklyn's Policy on Academic Integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: http://www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation.

A copy of the Faculty Action Report in Incidents of Academic Dishonesty is appended to this syllabus. This form, as well as full CUNY and Brooklyn College-specific policies and procedures, may be found in the folder "*Academic Integrity & Plagiarism Resources"* in the *"Syllabus & Other Course Info" section of BB. I* WILL report ALL instances of cheating, plagiarizing, or any other type of academic dishonesty.

Cheating on weekly quizzes or exams, for example by using notes or text, or by completing a test with assistance, constitutes an act of academic dishonesty and WILL be reported. In addition, all written assignments will be processed through SafeAssign, a plagiarism detection tool.

Center for Student Disability Services

In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services (CSDS). Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with Valerie Stewart-Lovell, Director CSDS, at 718-951-5538. If a student is already registered with CSDS, the student should provide the professor with the course accommodation form and discuss the specific accommodation with the professor. Per College policy, students are not permitted to bypass CSDS and go directly to a faculty member to request accommodation. Faculty members are not permitted to grant an accommodation without receiving the *Verification of Disability and Course Accommodations* forms from CSDS.

Please note that, in addition to chronic conditions, many students who are dealing with acute or short-term health issues may be eligible for accommodation, so get help if you need it.

PART IV. PRELIMINARY READING/ASSIGNMENT SCHEDULE & CALENDAR

This schedule, including assigned readings and due dates, is **SUBJECT TO REVISION** throughout the semester.

Session	Release date (Wednesday)	Topic	Readings	Activities due by the following Tuesday at 11:59pm
#1	2/3	``````````````````	ALL documents in the folder "Syllabus & Other Course Info"	1. Session #1 DB postings (class introduction) 2. Quiz #1 3. "Sample" Assignment (SafeAssign upload)
#2	2/10	Overview of Health Care: What it Is, What it Does	S&Y Ch. 1 B&G Chs. 1, 11 See BB for additional materials	1. Session #2 DB postings 2. Quiz #2
#3	2/17	Benchmarks Developments in U.S. Health Care	S&Y Ch. 2 See BB for additional materials	1. Session #3 DB postings 2. Quiz #3
#4	2/24	How Health Care is Organized I	S&Y Chs. 3, 4 See BB for additional materials	1. Session #4 DB postings 2. Quiz #4
#5	3/2	How Health Care is Organized II	B&G Chs. 5 & 6 See BB for additional materials	1. Session #5 DB postings 2. Quiz #5 3. "Feedback forum" posting due (mandatory, but ungraded)
#6	3/9	Accessing & Paying for Health Care	B&G Chs. 2, 4 See BB for additional materials	1. Session #6 DB postings 2. Quiz #6
#7	3/16	Cost Control	B&G Chs. 8, 9 See BB for additional materials	1. Session #7 DB postings 2. Quiz #7
#8	3/23	International Comparisons	B&G Ch. 14 See BB for additional materials	1. Session #8 DB postings 2. Quiz #8 3. Writing Assignment #1 of 5
#9	3/30	Quality of Health Care	B&G Ch. 10 See BB for additional materials	1. Session #9 DB postings 2. Quiz #9
#10	4/6*	Long Term Care	S&Y Ch. 8 B&G Ch. 12 See BB for additional materials	1. Session #10 DB postings 2. Quiz #10 3. Writing Assignment #2 of 5: Policy memo topic, outline, sources
Session	**Release date (Wednesday)**	**Topic**	**Readings**	**Activities due by the following Tuesday at 11:59pm**
#11	4/13*	Public Health and the Role of Government in Health Care	S&Y Ch. 10 See BB for additional materials	1. Session #11 DB postings 2. Quiz #11 3. Writing Assignment #3 of 5: Draft

Acronyms to know: Blackboard (BB); Discussion board (DB); Bodenheimer & Grumbach, 2012 (B&G); Sultz & Young, 2011 (S&Y)

#12	4/20 Assignment not due until 5/3	The Health Care Workforce	S&Y Chs. 5, 6 B&G Ch. 7 See BB for additional materials	1. Session #12 DB postings 2. Quiz #12 3. Writing Assignment #4 of 5: Peer review 4. "Feedback forum" posting due (mandatory, but ungraded)
SPRING BREAK				
#13	5/4	Current Reform in Context	B&G Ch. 15, 16 S&Y Ch. 12 See BB for additional materials	1. Session #13 DB postings 2. Quiz #13
#14	5/11	TBA	TBA	1. Writing Assignment #5 of 5: Final paper & response to reviewer
#15	5/18			1. Final Exam due

*4/11 last day to withdraw with a W.

IMPORTANT DATES FOR SPRING 2016

Full Spring 2016 academic calendar at http://www.brooklyn.cuny.edu/web/off_registrar/Spring_2016_calendar.pdf

Lincoln's Birthday (College closed)	Fri, Feb 12
Presidents' Day (College closed)	Mon, Feb 15
Last day to drop classes	Thurs, Feb 18
Conversion day (Classes follow Fri schedule)	Wed, Mar 23 (this course will still 'meet' today)
Spring Recess	Fri, Apr 22-30
Last day to apply for withdrawal (i.e., W grade)	Mon Apr 11
Last day of graduate classes	Fri, May 20

Appendix A: Writing for this Class

Developing your writing in this course

- This is a graduate-level course. You are expected to submit graduate-level writing*, including in your Discussion Board posts.* "Graduate-level writing" means written work that follows the directions of the assignment, articulates original ideas and insights, and is free of excessive spelling, grammatical, and writing errors. Please see the section, "Writing issues" for more details.

- Time management is essential to academic success. As a graduate student, you are expected to spend at least 3-5 hours per course credit, per week, doing course-related work. As this is a 3-credit class, you should anticipate spending 12-15 hours/week outside of class time doing work for this course. Please plan appropriately.

- Apart from learning content, another goal of the course is to develop or strengthen skills that will help you be a better student and, ultimately, a better professional. These skills include: articulating your ideas in writing, collaborating with peers, and engaging in a productive critique of your own writing.

Writing issues

- Spelling, punctuation, grammar, and writing ALWAYS count*, including in your Discussion Board posts.* You must write in full, properly punctuated, sentences. Sentences must be actual sentences, rather than sentence fragments. Paragraphs must contain thesis statements.

- Points will be automatically deducted from your grade if there are *excessive* and *serious* spelling, grammar, and/or writing issues.

- What counts as "excessive"? This varies by assignment, but my general rule of thumb is that the number of mistakes should not exceed the number of pages of that assignment. For example, if you are submitting a 5 page paper, any more than 5 errors could lead to a reduction in your grade.

- What counts as "serious"? Again, there is no hard and fast rule, but here is how I break down categories of "spelling/grammar/writing issues." The examples given below are from graduate student papers.

    - Sentence is grammatically incorrect or awkward. Usually requires reshuffling words.
      Example: "The next goal Braun et al. (2007) acts on is when and where did race become so important in health."
    - Sentence is unclear, but I have some idea what writer is trying to say
      Example: "The residential concentration of African Americans is very typical, and marinating the inequality of socioeconomic medical care between these neighborhoods when compared to the whites' is an important factor for continuing the gap."
    - Sentence is very unclear and I have little or no idea what writer is trying to say
      Example: "Categories of race that define illnesses came into medical research with the intention to arrange full racial formation in clinical trial."

- **For additional assistance with writing issues, contact the Brooklyn College Learning Center, which offers one-on-one tutoring, at 718-951-5821 or http://lc.brooklyn.cuny.edu**

The citation style and formatting of papers in this course

- You must properly cite each data source, both in text and in a reference section at the end of the paper, per American Psychological Association (APA) style (6th edition).
    - For more guidance on **HOW** to cite sources in APA format, please see http://owl.english.purdue.edu/owl/resource/664/01/ as well as other resources available in the "APA Resources" folder in the "Syllabus and Other Course Info" section of BB. For students who use RefWorks, Endnote, or any other bibliographical/citation program, please note that it is YOUR responsibility to double-check the output these programs produce, as it is YOU who are ultimately liable for all of the work you submit.
    - If you are unsure of **WHEN** to cite a source, please see the "Academic Integrity & Plagiarism Resources" folder in the "Syllabus and Other Course Info" section. *Do not make up your own rules about what is or is not plagiarism, or go by the standards you thought were in place based on previous classes.*

- Unless otherwise specified, your papers should be typed, double spaced, with 1 inch margins and 12 point font. All pages must be numbered.

- Points will be automatically deducted from your grade if your assignment is not formatted as instructed. Here are a few examples:
    - If your assignment has 1.5 spacing rather than double spacing, you will lose points
    - If your margins are 1.25" and not 1", you will lose points
    - If your assignment is doesn't have a bibliography or "works cited" section (and you were asked to create one), you will lose points
    - If your citations are not presented in APA format, you will lose points

- BOTTOM LINE: Formatting is not hard; looking up citation style is not hard. Just follow the directions you are given!

Submission policy

- Unless noted otherwise, written assignments must be successfully uploaded or posted to BB by the date and time indicated. If you do not this, the assignment is not considered to be submitted. NO EXCEPTIONS.

Plagiarism

- All work must be properly cited. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. We may review strategies for avoiding plagiarism in this class; however it is ultimately YOUR job to know what is and is not plagiarism.

- The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found in the "Academic Integrity & Plagiarism Resources" folder in the "Syllabus and Other Course Info" section.

- Note that all written assignments will be processed through SafeAssign, a plagiarism detection tool. However, SafeAssign is not the only method I may employ to detect plagiarism.

- If you are caught plagiarizing you will get an F in this course. I am also required by the college to submit a "Faculty Action Report Form for Incidents of Academic Dishonesty." NO EXCEPTIONS.

Appendix B: Grading Rubric for Discussion Board Participation

Overview: Discussion boards are an integral part of this online course. The majority of your participation grade will consist of posting to weekly discussion boards (14 sessions in total). For *each* of the 14 sessions, you should post a total of 3 posts, for which you will earn approximately 2 points towards your participation grade per week. *Note that I will not be responding to every post of every thread, but I will be popping in to each DB periodically to spur conversation or give feedback.*

Specific requirements by type of discussion board post

Type of post	Original Post/Thread	Reply/Interaction Posts
Frequency	• At least 1 per week, though you may post more often	• At least 2 per week, though you may post more often
Length	• At least **150** words. Posts must be free of spelling, punctuation, grammatical or other writing issues.	• At least **25** words. Posts must be free of spelling, punctuation, grammatical or other writing issues.
For full credit	• Posting was placed in the appropriate DB within the week indicated • Posting was responsive to the discussion board prompt question, and consisted of substantive comments that enhanced the discussion and helped move the conversation forward. These comments may have included follow up questions, examples, or new perspectives • When not posting first, comments provided evidence that the participant had read at least some postings from colleagues • Posting showed ample evidence of having reviewed, or completed the relevant readings or assignments • Posting was constructive and differences of opinion expressed in a collegial manner	• Posting was placed in the appropriate DB within the week indicated • Posting was responsive to the discussion board prompt question, and consisted of substantive comments that enhanced the discussion and helped move the conversation forward. These comments may have included follow up questions, examples, or new perspectives • Posting provided evidence that the participant had actually read the colleague's posting • Posting was constructive and differences of opinion expressed in a collegial manner

In addition, ALL posts should demonstrate:

- *Quality of Thinking*: Develop, support, and convey clear, focused, and substantive ideas in ways appropriate to topic, context, audience, and purpose
- *Organization and Coherence:* Organize writing in clear, coherent sequences, making connections and transitions among ideas, paragraphs, and sentences
- *Sentence Structure and Word Choice:* Use and vary sentence structures and word choices to achieve clear and fluent writing
- *Editing:* Edit for correct spelling, grammar, punctuation, capitalization, paragraph structure, sentence construction, formatting, and, when appropriate, citations
- *Use of Researched Information:* Use, integrate, and cite researched information and evidence
- *Reflection:* Evaluate and articulate one's own point of view supported by research and logic

Remember: DB posts are formal written assignments for a graduate-level course and will be graded as if you had handed in your writing on a piece of paper (e.g., in the form of an essay or research paper).

Appendix C: Brooklyn College Faculty Action Report for Incidents of Academic Dishonesty*

Print Form

BROOKLYN COLLEGE

Faculty Action Report Form for Incidents of Academic Dishonesty

If a faculty member, upon investigation, confirms that a suspected violation of the CUNY Policy on Academic Integrity has occurred and/or if the student admits to the violation, the faculty member **must** report the violation by completing and submitting a FAR Form.

The form should be forwarded to the appropriate Academic Integrity Official. For a violation in an undergraduate course send the form to Mr. Patrick Kavanagh (3208 Boylan Hall); for a violation in a graduate course send the form to Professor Philip Gallagher (3227 Boylan Hall).

A. Information about the Incident

Student Name: _____ Student ID#: _____

Date of Incident: ____ / ____ / ____ Type of Incident: ☐ Cheating ☐ Plagiarism ☐ Other

Description of Incident (please be specific): _____

_____

_____

Indicate the outcome of your discussion of the violation with the student: _____

_____

_____

Course Title: _____ Course Number: _____ Section: _____

Instructor Name: _____ Dept: _____

Phone: _____ E-mail: _____

B. Academic (Grade) Sanction

What academic sanction are you imposing?

☐ Failing Grade on Exam/Assignment ☐ Failing Grade for Course

☐ Other (please explain): _____

Did the student accept this sanction: ☐ Yes ☐ No, please explain: _____

_____

C. Disciplinary Complaint Option

Are you filing a disciplinary complaint with the Office of the Dean of Student Affairs for investigation and possible disciplinary charges?

☐ No

☐ Yes - Please be sure to enter a PEN grade for the course and to forward the *Disciplinary Complaint Form* and all supporting documentation to the Office of Student Affairs.

Instructor Signature _____ Date: ____ / ____ / ____

* Copies of all disciplinary forms are available for print-out at http://www.brooklyn.cuny.edu/bc/offices/studlife/ (under the category "Get It Right").

Revised 9/2007

**Note that a copy of this form, as well as the full CUNY Policy on Academic Integrity and Brooklyn College-specific procedures, is available in "Academic Integrity & Plagiarism Resources" in the "Syllabus & Other Course Info" folder on BB.*

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

HNSC 7140 [Code: 68080, Section NETB]
Fundamentals of Health Policy and Management
3 Credits
Spring 2016

Time and location	Fully online
Instructor	Peter Freeman, MPH peter.freeman59@brooklyn.cuny.edu; 773-318-4842 Skype: petaire.finch
Office hours	By appointment only. Please email or call for an appointment.
Course website	*This is a fully online course. This means that, as with a traditional class, you are responsible for weekly readings and activities. Unlike a traditional class, you are expected to independently access and view course materials every week, and to participate in online discussion boards (DB), as well as to complete activities and take quizzes and exams online. All weekly course materials will be made available by MONDAY; weekly assignments are due by the following THURSDAY and SUNDAY nights. It is YOUR responsibility to successfully log onto Blackboard and successfully participate in the course throughout the semester. If you need assistance, Brooklyn College's Information Technology Systems (ITS) Help Desk can be accessed by calling 718-951-4188 (9 AM-5 PM) or emailing helpdesk@brooklyn.cuny.edu.
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Examination of the development of modern medical systems; description and discussion of the organization of the agencies and personnel constituting the health care system; the planning, administration, management, evaluation, and policy and analysis of health programs; investigation of the health legislative process and institutions that attempt to influence the process. Study of the principles and programs involved in the financing of health care services; critical analysis of current criticisms of the modus operandi of the health care system.
Course prerequisites	N/A
Course format	Fully online
Required reading and resources	Bodenheimer, T.S. & Grumbach, K. (2012). Understanding Health Policy: A Clinical Approach (6th edition), New York: McGraw Hill. ISBN-10: 0071770526; ISBN-13: 978-0071770521 Sultz, H.A. & Young, K.M. (2013). Health Care USA: Understanding Its Organization and Delivery (8th edition), Boston, MA: Jones & Bartlett. ISBN-10: 1284029883; ISBN-13: 978-1284029888 Assignments and additional required readings will be posted on Blackboard

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Assess the effects of political, social and economic policies on public health systems and the health of urban population's terms of effectiveness, efficiency and equity. • Discuss political and economic feasibility issues related to health policy.	• Sessions 2-14; DB postings
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe evidence-based approaches in the development and evaluation of public health policies and interventions. • Discuss the function and role of management and the organizational structure of public health organizations • Explain quality and performance improvement concepts employed in public health organizations.	• Sessions 2-14; Writing Assign. 1-5
Adhere to ethical and social justice principles and standards	• Understand how ethics plays into the delivery of healthcare services • Describe what population(s) experience disproportionately low representation in the access of healthcare services	• Sessions 2-14; DB postings; Writing Assign. 2-5
Interpret and analyze public health literature and apply evidence-based research	• Identify reputable sources of public health data • Interpret and communicate findings from research related to healthcare delivery and outcomes	• Sessions 2-14; Writing Assign. 1-5
Communicate public health information through oral, written, digital and visual presentation	• Communicate the impact of current and potential policies to the lay public, advocacy groups and policy professionals.	• Writing Assign. 1-5
Explain how social, behavioral, biomedical and	• Analyze the impact of individual, organizational,	• DB postings; Sessions 2-14

environmental determinants affect population health	community, national and global trends and interdependencies on public health related problems and health disparities.	
Engage and collaborate with diverse groups	• Effectively communicate ideas and concepts of healthcare delivery to colleagues and peers	• DB postings
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Describe the legal foundation of public health and the public health policy process, including the role of each level and branch of government in assuring the health of the public. • Assess the main components of, and issues related to, the organization, financing and delivery of health services and public health in the U.S. in terms of equity, access cost and effectiveness.	• Sessions 2-14; Writing Assign. 1, 2, 5
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Describe communication, strategic planning and marketing principles related to public health activities across different settings and audiences. • Investigate the role of major stakeholders including non-profit and community-based organizations in the policy process and their impact on public health.	• Sessions 2-14; Writing Assign. 1-2
Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Discuss the roles of major influencing factors in the development of healthcare policies and practices, including finances and quality metrics	• Sessions 2-14; DB postings; Writing Assign. 1

PART I. COURSE COMPONENTS & ASSESSMENT

Online courses can be challenging to master in the beginning. As a first step you MUST thoroughly review both this syllabus and the other materials available in the "Syllabus" & "Course Documents" folders and the "Session #1 (Orientation)" folder on BB.

Technical requirements

I. Access to an Internet connection with high bandwidth for streaming video, Flash and audio
I. Mozilla Firefox or Microsoft Internet Explorer Internet browsers preferred
II. Microsoft Office applications (Word, Excel, PowerPoint), version 2010 or later
III. You may NOT use a Smartphone, tablet or any other device other than a computer to complete activities such as DB posts or quizzes.

For technical assistance with BB: Please contact Brooklyn College Information Technology Services (ITS) Help Desk at 718-951-4188 (9 AM-5 PM) or helpdesk@brooklyn.cuny.edu.

Student expectations

I. Students are expected to thoroughly understand all requirements, components, and procedures of this online class by carefully reviewing this syllabus and asking questions.
II. Students are expected to successfully navigate the various components of Blackboard, including the Discussion Boards, assignments, and quizzes, by dedicating an adequate amount of time (well in advance of any deadlines) to exploring the site and accessing the help resources available to them.
III. Students are expected to log onto the course BB site several times a week to read announcements, retrieve and view course materials, and participate in the Discussion Boards.
IV. Students are expected to ensure that they have reliable and timely access to an adequate Internet connection. In other words, if your home computer crashes or Internet access fails, you will be able to use a university computer or a friend's computer to access course materials, submit postings and assignments, and take exams by the stated deadline. "My computer or Internet crashed so I couldn't post to the Discussion Board or take the quiz" is not an acceptable excuse!

Assessment

The way you are assessed and graded for an online class does not differ greatly from a face-to-face class. Your grade is derived from three basic course components, which are listed below and described in detail in the table presented on the next two pages.

I.	Participation (primarily from 3 weekly Discussion Board posts)	30%
II.	Weekly quizzes (14 in total) and Final Exam	35%
III.	Written assignments (5 in total)	35%

Acronyms to know: BB = Blackboard; DB = Discussion board; B&G = Bodenheimer & Grumbach, 2012; S&Y = Sultz & Young, 2013

Component	% of Grade	What is it?	Where is it?	What else should I know?
(1) Discussion board (DB) participation	30%	I. The majority of your participation grade will consist of posting to weekly discussion boards (14 sessions in total). For each of the 14 sessions, you should post a total of 3 posts. These posts should consist of 1 substantive original post (e.g., thread) of at least 150 words and 2 short interaction/reply posts of at least 25 words in response to other students' original posts. II. Some additional online assignments will also count towards your participation grade, including providing feedback for the course in two "Feedback forums." These postings are mandatory, but graded as "pass/fail." III. All original postings are due by 11:59 PM on Thursday, reply posts are due 11:59 PM on the Sunday at the end of the session week.	I. Each week's DB is located in that week's folder – so the DB for Session #1 is located in the Session #1 folder, etc.	I. DB posts are formal written assignments for a graduate-level course and will be graded as if you had handed in your writing on a piece of paper (e.g., in the form of an essay or research paper). II. Please see Appendix A "Writing for this Class," as well as Appendix B "Grading Rubric for Discussion Board Participation."
(2) Quizzes/ Final Exam	35%	1. There will be 14 weekly quizzes throughout the semester, each worth 2% of your final grade. These quizzes are short (approximately 10 questions, usually multiple choice), timed (you have 20 minutes to complete each quiz, and you may not stop once you have started a quiz), and must be completed individually and without referring to notes or text. All quizzes are due by 11:59 PM on the Sunday at the end of the session week. 2. The final exam is longer, and is worth 7% of your final grade. The final exam is due by the end of Session #15.	1. Each week's quiz is located in that week's folder – so the Quiz #1 is located in the Session #1 folder, etc. 2. The final exam will be located in the Session #15 folder.	1. Nervous about what a timed online quiz is like? Take "Quiz #1," located in the "Session #1" folder, to get a feel for it. All students will receive full credit for this first quiz as long as they complete it on time!

Component	% of Grade	What is it?	Where is it?	What else should I know?
(3) Writing Assignments	35%	• You will have 5 writing assignments due throughout the semester. Each assignment is worth 7% of your final grade and "builds up" to a 3-6 page policy memo on a health topic of your choice that also incorporates at least one international comparison. These assignments consist of: • Writing Assignment #1: International comparisons exercise • Writing Assignment #2: Policy memo topic, outline, sources • Writing Assignment #3: Draft of a policy memo (3-6 pgs.). Graded as "pass/fail" -- full credit will be awarded if assignment is submitted on time • Writing Assignment #4: "Double-blind" peer review of a classmate's policy memo draft • Writing Assignment #5: Final submission of your policy memo and response to peer reviewer • Note that all written assignments must be processed through SafeAssign, a plagiarism detection tool. • • All assignments are due by 11:59 PM on the Sunday at the end of the session week in which they are due. NO LATE WORK WILL BE ACCEPTED. NO EXCEPTIONS.	• All assignments are in the "Assignments" folder in BB. • Unlike quizzes, lectures, and DB's, which are released on a week-by-week basis, all written assignments are available to you at least 6 weeks before the deadline (usually sooner) and may be found in the "Assignments" folder in BB. As such, you may work on most assignments throughout the semester, though there is a finite deadline for each.	• Please see Appendix A "Writing for this Class." • • Anxious about SafeAssign? As your first assignment ("Sample Assignment"), you are asked to upload any college-level paper with citations to the SafeAssign link provided and to view the results. This is a Pass/Fail assignment! I will not be grading (or even viewing) the SafeAssign results; I just want you to become familiar with how the program works.

Grading scale^

97-100=A+	86-89=B+	77-79=C+
93-96=A	83-85=B	73-76=C
90-92=A-	80-82=B-	Less than 73=F

^ A few notes about the grading scale:

(1) Students enrolled in this course come from many different programs and situations. For example, some students may have been admitted on a non-matriculated basis, such that earning a certain grade in this class may be a condition of matriculating. Some students are MPH students, who are required to earn at least a B in all of the 10 "core" public health courses (if this information is news to you, you should review the Brooklyn College Graduate Bulletin ASAP). Keep in mind that I don't necessarily know who is who, so it is each student's personal

responsibility to monitor their grades and their progress. Moreover, everyone is judged by the same standard, no matter what grade they "need" to get.

(2) Note that there is no grade of D in any of the graduate programs at Brooklyn College.

(3) My policy is that I do not give INC grades. No exceptions.

An illustration of how weekly deadlines work in this class (Note that the class week starts on MON and ends on SUN).

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Session #2 released at 12:00 AM			Original 150-word DB post by 11:59 PM		
Quiz, 25-word DB replies, etc. due by 11:59 PM.	Session #3 released at 12:00 AM			Original 150-word DB post by 11:59 PM		
Quiz, 25-word DB replies, etc. due by 11:59 PM.	Session #4 released at 12:00 AM			Original 150-word DB post by 11:59 PM		
Quiz, 25-word DB replies, etc. due by 11:59 PM.						

Suggestions for a successful online experience

Time management is crucial in an online class. It is expected you will have completed all the assigned reading for each of the class sessions, and that you will join each week's Discussion Board (DB) prepared to thoughtfully read, write, and learn.

Please note that this marks a significant difference from some face-to-face courses, where you might be able to fall behind on reading and catch up before exams or papers are due without your grade being affected. Staying on schedule by doing the reading will make the class more enjoyable for you, make for a better learning experience, make for livelier Discussion Boards, and improve your grade.

I would suggest the following sequence of events for any given session:

1. "ANYTIME" ACTIVITIES: You may do these activities at any time before their due dates

- Read the textbook chapters that are due for the upcoming week. You may do this at any time, as all assigned readings from the textbooks are listed in this syllabus.

- Work on any upcoming writing assignments. Assignments are usually available in the "Assignments" folder on BB at least 6 weeks before the due date.

2. SESSION-SPECIFIC ACTIVITIES: For any given session, from Friday onwards you may log onto BB to access that week's materials (labeled Session #1, Session #2, etc.). You have until the following Thursday night to:

- Retrieve course materials for that week's topic

- Post to BB for that week, remember that the longer original post is due on Thursday night, and the reply posts are due on Sunday night, but there is nothing stopping you from posting earlier.

- Take the weekly quiz. The quizzes are based on both the textbook readings and the materials presented in each session folder. Each quiz is also due by Thursday night, but you should take it whenever you have completed reviewing the materials for that week.

- IMPORTANT: Do not wait until Sunday night to complete the session-specific activities!

PART II. COURSE POLICIES

Email correspondence

I will respond to most questions via email, however if you have a more substantive issue to address please arrange to meet with me either in person, on the phone, or via Skype.

When you email me, you can usually expect a response within 2 business days, sometimes sooner. Do not expect an immediate response. Note that I do not respond to emails on the weekend.

Golden Rules for Email

- Keep in mind that I get many emails a day. ALWAYS put "HNSC 7140 - [Your name]" in the subject line so that I know who the message is from and what it is in regard to.
- You are expected to conduct yourself in a professional manner in all of your interpersonal interactions, including in email. Email is a formal means of communication in the context of school or work; please sign every message at the bottom, use polite language, capital letters, punctuation, greetings and salutations. Please avoid abbreviations, slang and cuteness (including emoticons).

Other forms of communication

In person: As noted above, in-person meetings are available by appointment only. As I am an Adjunct Lecturer teaching a fully online course, I am not regularly on campus. Appointments may be held on Brooklyn College's campus (please note that if we meet on campus, it will be after business hours [e.g., 6 PM or later]) or elsewhere in Brooklyn or Manhattan if that is more conducive to our schedules.

Phone or Skype: I can also make appointments to either talk with students on the phone or communicate via Skype. When meeting via phone or Skype, please make sure you are in location with a reasonable level of quiet and reliable cell or internet connectivity. Treat these appointments as is they were a face-to-face meeting.

*A note on texting: In general, I do not accept communication via text message. Instances where I will communicate via text include alerting me to an e-mail that requires my attention sooner than 2 business days or letting me know you are running late for an appointment. Like with e-mail communication, I consider these text messages a formal means a communication and expect your conduct to be professional. Text messages utilizing text lingo will be ignored. Please also include your name in the text message.

PART III. INSTITUTIONAL POLICIES

University's Policy on Academic Integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: http://www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member must report the violation.

A copy of the Faculty Action Report in Incidents of Academic Dishonesty is appended to this syllabus. This form, as well as full CUNY and Brooklyn College-specific policies and procedures, may be found in the folder "Plagiarizing and How Not To Do It" in the "Course Documents" section of BB. I will report all instances of cheating, plagiarizing, or any other type of academic dishonesty.

Cheating on weekly quizzes or exams, for example by using notes or text, or by completing a test with assistance, constitutes an act of academic dishonesty and will be reported. In addition, all written assignments will be processed through SafeAssign, a plagiarism detection tool.

Center for Student Disability Services

In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services (CSDS). Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with CSDS by calling 718-951-5538. If a student is already registered with CSDS, the student should provide me with the course accommodation form and discuss the specific accommodation with me. Per College policy, students are not permitted to bypass CSDS and go directly to a faculty member to request accommodation. Faculty members are not permitted to grant an accommodation without receiving the Verification of Disability and Course Accommodations forms from CSDS.

Please note that, in addition to chronic conditions, many students who are dealing with acute or short-term health issues may be eligible for accommodation.

PART IV. PRELIMINARY READING/ASSIGNMENT SCHEDULE & CALENDAR

This schedule, including assigned readings and due dates, is SUBJECT TO REVISION throughout the semester.

Session	Release date (Monday)	Topic	Readings	Activities due by the following Sunday at 11:59 PM[1]
#1	2/1	Introduction to the Course	ALL documents in the folder "Syllabus" & "Course Documents" folders	1. Session #1 DB postings (class introduction) 2. Quiz #1 3. Sample Assignment (SafeAssign upload)
#2	2/8	Overview of Health Care: What it Is, What it Does	S&Y Ch. 1 B&G Chs. 1, 11 See BB for additional materials	1. Session #2 DB postings 2. Quiz #2
#3	2/15[2]	International Comparisons	B&G Ch. 14 See BB for additional materials	1. Session #3 DB postings 2. Quiz #3
#4	2/22	How Health Care is Organized: Part I	S&Y Chs. 4 & 5 See BB for additional materials	1. Session #4 DB postings 2. Quiz #4
#5	2/29	How Health Care is Organized: Part II	B&G Chs. 5 & 6 See BB for additional materials	1. Session #5 DB postings 2. Writing Assignment #1 of 5
#6	3/7	Paying for Health Care	S&Y Ch. 8 B&G Chs. 2, 4 See BB for additional materials	1. Session #6 DB postings 2. Quiz #6 3. "Feedback forum" posting due (mandatory, but ungraded)
#7	3/14	Cost Control	B&G Chs. 8, 9 See BB for additional materials	1. Session #7 DB postings 2. Quiz #7
#8	3/21	Benchmark Developments in U.S. Health Care	S&Y Ch. 2 B&G Ch. 16 See BB for additional materials	1. Session #8 DB postings 2. Quiz #8 3. Writing Assignment #2 of 5
#9	3/28	Quality of Health Care	B&G Ch. 10 See BB for additional materials	1. Session #9 DB postings 2. Quiz #9
#10	4/4	Long Term Care	S&Y Ch. 9 B&G Ch. 12 See BB for additional materials	1. Session #10 DB postings 2. Quiz #10
#11	4/11	Health Care & Mental Health	S&Y Ch. 10 See BB for additional materials	1. Session #11 DB postings 2. Quiz #11 3. Writing Assignment #3 of 5
#12	4/18[3]	Public Health and the Role of Government in Health Care & Health Care Ethics	S&Y Ch. 11 B&G Ch. 13 See BB for additional materials	1. Session #12 DB postings 2. Quiz #12
SPRING BREAK				

[1] Except for original DB postings, which are due by 11:59 PM on Thursday

[2] Despite Lincoln's Birthday, Week #3 materials will still be released on Monday, February 15th

[3] Due to Spring Recess, Reply DB Posts and Quiz #12 are due by 11:59 PM on Sunday, May 1st

Session	Release date (Monday)	Topic	Readings	Activities due by the following Sunday at 11:59 PM[4]
#13	5/2	The Health Care Workforce	S&Y Chs. 6 & 7 B&G Ch. 7 See BB for additional materials	1. Session #13 DB postings 2. Quiz #13 3. Writing Assignment #4 of 5: Peer review 4. "Feedback forum" posting due (mandatory, but ungraded)
#14	5/9	Current Reform in Context	B&G Ch. 15 S&Y Ch. 13 See BB for additional materials	1. Session #14 DB postings 2. Quiz #14
#15	5/16	Health Information Technology	S&Y Ch. 3 See BB for additional materials	1. Final Exam due 2. Writing Assignment #5 of 5: Final paper & response to reviewer

IMPORTANT DATES FOR SPRING 2016

Full Spring 2016 academic calendar at:
http://www.brooklyn.cuny.edu/web/about/administration/enrollment/registrar/bulletins/spring16/calendar.php

Classes begin	Fri, Jan 29
Lincoln's Birthday (College closed)	Fri, Feb 12
Presidents' Day (College closed)	Mon, Feb 15
Last day to drop classes without a "W"	Thurs, Feb 18
Conversion day (Classes follow Fri schedule)	Wed, Mar 23
No classes	Fri, Mar 25 - Sun, Mar 27
Spring Recess	Fri, Apr 22 - Sat, Apr 30
Final Examinations	Mon, May 23 - Fri, May 27

[4] Except for original DB postings, which are due by 11:59 PM on Thursday

Appendix A: Writing for this Class

Developing your writing in this course

- This is a graduate-level course. You are expected to submit graduate-level writing, including in your Discussion Board posts. "Graduate-level writing" means written work that follows the directions of the assignment, articulates original ideas and insights, and is free of excessive spelling, grammatical, and writing errors. Please see the section, "Writing issues" for more details.

- Time management is essential to academic success. As a graduate student, you are expected to spend at least 3-5 hours per course credit, per week, doing course-related work. As this is a 3-credit class, you should anticipate spending 12-15 hours/week doing work for this course. Please plan appropriately.

- Apart from learning content, another goal of the course is to develop or strengthen skills that will help you be a better student and, ultimately, a better professional. These skills include: articulating your ideas in writing, collaborating with peers, and engaging in a productive critique of your own writing.

Writing issues

- Spelling, punctuation, grammar, and writing ALWAYS count, including in your Discussion Board posts. You must write in full, properly punctuated, sentences. Sentences must be actual sentences, rather than sentence fragments. Paragraphs must contain thesis statements.

- Points will be automatically deducted from your grade if there are excessive and serious spelling, grammar, and/or writing issues.

- What counts as "excessive"? This varies by assignment, but my general rule of thumb is that the number of mistakes should not exceed the number of pages of that assignment. For example, if you are submitting a 5 page paper, any more than 5 errors could lead to a reduction in your grade.

- What counts as "serious"? Again, there is no hard and fast rule, but here is how I break down categories of "spelling/grammar/writing issues." The examples given below are from graduate student papers.

    - Sentence is grammatically incorrect or awkward. Usually requires reshuffling words.
      Example: "The next goal Braun et al. (2007) acts on is when and where did race become so important in health."
    - Sentence is unclear, but I have some idea what writer is trying to say
      Example: "The residential concentration of African Americans is very typical, and marinating the inequality of socioeconomic medical care between these neighborhoods when compared to the whites' is an important factor for continuing the gap."
    - Sentence is very unclear and I have little or no idea what writer is trying to say
      Example: "Categories of race that define illnesses came into medical research with the intention to arrange full racial formation in clinical trial."

- For additional assistance with writing issues, contact the Brooklyn College Learning Center, which offers one-on-one tutoring, at 718-951-5821, LC@brooklyn.cuny.edu, or http://lc.brooklyn.cuny.edu

The citation style and formatting of papers in this course

- You must properly cite each data source, both in text and in a reference section at the end of the paper, per American Psychological Association (APA) style (6th edition).
    - For more guidance on HOW to cite sources in APA format, please see https://owl.english.purdue.edu/owl/section/2/10/ as well as other resources available in the "APA Style" folder in the "Course Documents" section of BB. For students who use RefWorks, Endnote, or any other bibliographical/citation program, please note that it is YOUR responsibility to double-check the output these programs produce, as it is YOU who are ultimately liable for all of the work you submit.
    - If you are unsure of WHEN to cite a source, please see the "Plagiarism and How Not To Do It" folder in the "Course Documents" section. Do not make up your own rules about what is or is not plagiarism, or go by the standards you thought were in place based on previous classes.

- Unless otherwise specified, your papers should be typed, double spaced, with 1 inch margins and 12 point font. All pages must be numbered.

- Points will be automatically deducted from your grade if your assignment is not formatted as instructed. Here are a few examples:
    - If your assignment has 1.5 spacing rather than double spacing, you will lose points
    - If your margins are 1.25" and not 1", you will lose points
    - If your assignment doesn't have a bibliography or "works cited" section (and you were asked to create one), you will lose points
    - If your citations are not presented in APA format, you will lose points
    - If your assignment is to be 2-3 pages in length and you submit 1.5 pages, you will lose points. Similar rules apply for word counts.

- BOTTOM LINE: Formatting is not hard; looking up citation style is not hard. Just follow the directions you are given.

Submission policy

- Unless noted otherwise, written assignments must be successfully uploaded or posted to BB by the date and time indicated. If you do not this, the assignment is not considered to be submitted. No exceptions.

Plagiarism

- All work must be properly cited. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. We may review strategies for avoiding plagiarism in this class; however it is ultimately YOUR job to know what is and is not plagiarism.

- Note that all written assignments will be processed through SafeAssign, a plagiarism detection tool. However, SafeAssign is not the only method I may employ to detect plagiarism.

- If you are caught plagiarizing you will get an F in this course. I am also required by the college to submit a "Faculty Action Report Form for Incidents of Academic Dishonesty" (Appendix C).

Appendix B: Grading Rubric for Discussion Board Participation

Overview: Discussion boards are an integral part of this online course. The majority of your participation grade will consist of posting to weekly discussion boards (14 sessions in total). For each of the 14 sessions, you should post a total of 3 posts, for which you will earn approximately 2 points towards your participation grade per week. Note that I will not be responding to every post of every thread, but I will be popping in to each DB periodically to spur conversation or give feedback.

Specific requirements by type of discussion board post

Type of post	Original Post/Thread	Reply/Interaction Posts
Frequency	· At least 1 per week, though you may post more often	· At least 2 per week, though you may post more often
Length	· At least 150 words. Posts must be free of spelling, punctuation, grammatical or other writing issues.	· At least 25 words. Posts must be free of spelling, punctuation, grammatical or other writing issues.
For full credit	· Posting was placed in the appropriate DB within the week indicated · Posting was responsive to the discussion board prompt question, and consisted of substantive comments that enhanced the discussion and helped move the conversation forward. These comments may have included follow up questions, examples, or new perspectives · When not posting first, comments provided evidence that the participant had read at least some postings from colleagues · Posting showed ample evidence of having reviewed, or completed the relevant readings or assignments · Posting was constructive and differences of opinion expressed in a collegial manner	· Posting was placed in the appropriate DB within the week indicated · Posting was responsive to the discussion board prompt question, and consisted of substantive comments that enhanced the discussion and helped move the conversation forward. These comments may have included follow up questions, examples, or new perspectives · Posting provided evidence that the participant had actually read the colleague's posting · Posting was constructive and differences of opinion expressed in a collegial manner

In addition, ALL posts should demonstrate:

- Quality of Thinking: Develop, support, and convey clear, focused, and substantive ideas in ways appropriate to topic, context, audience, and purpose
- Organization and Coherence: Organize writing in clear, coherent sequences, making connections and transitions among ideas, paragraphs, and sentences
- Sentence Structure and Word Choice: Use and vary sentence structures and word choices to achieve clear and fluent writing
- Editing: Edit for correct spelling, grammar, punctuation, capitalization, paragraph structure, sentence construction, formatting, and, when appropriate, citations
- Use of Researched Information: Use, integrate, and cite researched information and evidence
- Reflection: Evaluate and articulate one's own point of view supported by research and logic

Remember: DB posts are formal written assignments for a graduate-level course and will be graded as if you had handed in your writing on a piece of paper (e.g., in the form of an essay or research paper)

Appendix C: Brooklyn College Faculty Action Report for Incidents of Academic Dishonesty*

Print Form

BROOKLYN COLLEGE

Faculty Action Report Form for Incidents of Academic Dishonesty

If a faculty member, upon investigation, confirms that a suspected violation of the CUNY Policy on Academic Integrity has occurred and/or if the student admits to the violation, the faculty member **must** report the violation by completing and submitting a FAR Form.

The form should be forwarded to the appropriate Academic Integrity Official. For a violation in an undergraduate course send the form to Mr. Patrick Kavanagh (3208 Boylan Hall); for a violation in a graduate course send the form to Professor Philip Gallagher (3227 Boylan Hall).

A. Information about the Incident

Student Name: _____ Student ID#: _____

Date of Incident: ____ / ____ / ____ Type of Incident: ☐ Cheating ☐ Plagiarism ☐ Other

Description of Incident (please be specific): _____

_____

_____

Indicate the outcome of your discussion of the violation with the student: _____

_____

_____

Course Title: _____ Course Number: _____ Section: _____

Instructor Name: _____ Dept: _____

Phone: _____ E-mail: _____

B. Academic (Grade) Sanction

What academic sanction are you imposing?

☐ Failing Grade on Exam/Assignment ☐ Failing Grade for Course

☐ Other (please explain): _____

Did the student accept this sanction: ☐ Yes ☐ No, please explain: _____

_____

C. Disciplinary Complaint Option

Are you filing a disciplinary complaint with the Office of the Dean of Student Affairs for investigation and possible disciplinary charges?

☐ No

☐ Yes - Please be sure to enter a PEN grade for the course and to forward the *Disciplinary Complaint Form* and all supporting documentation to the Office of Student Affairs.

Instructor Signature _____ Date: ____ / ____ / ____

* Copies of all disciplinary forms are available for print-out at http://www.brooklyn.cuny.edu/bc/offices/studlife/ (under the category "Get It Right").

Revised 9/2007

Appendix B: Grading Rubric for Discussion Board Participation

City University of New York
School of Public Health
Brooklyn College

HNSC 7142X: Health Policy and Administration in Public Health
Spring 2016

Catalogue description	Study of public health policy and its impact on health care service organization, administration, and delivery. Study of public policies that drive health care organization and delivery. Examples of special topics in public health policy such as Medicare and Medicaid development and changes. Administrative responses to policy shifts. Increasing complexity and frequent changes in law and regulation change how health care services are defined and delivered.
Prerequisite	Health and Nutrition Sciences 7140X [770X] or its equivalent. Graduate students are welcomed and may be enrolled with the permission of the instructor.
Course meets	Tuesdays 6:30PM-9PM, Ingersoll Hall 4145N
Instructor	Gordon Shen, PhD, SM Assistant Professor of Health Care Policy, Management, and Administration
Email	Gordon.Shen@brooklyn.cuny.edu
Phone	(718) 951-2059
Office	Ingersoll Hall 0119
Office hours	Tuesdays, 9:00PM-10:00PM, or by appointment.
Required books	1. Teitelbaum, JB & Wilensky, SE. (2014). *Essentials of Health Policy and Law: with 2015 Annual Health Reform Update (2nd Edition)* New York, NY: Jones & Bartlett Learning. ("TW"). 2. Bodenheimer TS & Grumbach K. (2012). *Understanding Health Policy: A Clinical Approach (6th Edition)*. New York, NY: McGraw-Hill Companies, Inc. ("BG")
Other required reading materials	Articles listed from p.9-p.14 will be posted on Blackboard (https://bbhosted.cuny.edu).
Recommended books	• Bardach E. (2015). *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving*. Fifth Edition. CQ Press. • Stone, D. (2002). *Policy Paradox: The Art of Political Decision Making, Revised Edition*, New York: W. W. Norton. • Kingdon JW. (2011). *Agendas, Alternatives, and Public Policies*. Updated Second Edition. Longman. • Starr, P. (1984). *The Social Transformation of American Medicine*. New York: Basic Books. • Oberlander, J. (2003). *The Political Life of Medicare*. Chicago: U Chicago Press. • McDonough, J. (2011). *Inside National Health Reform*. New York: Milbank. • Engel, J. (2006). *Poor People's Medicine: Medicaid and American Charity Care since*

	1965. Durham, NC: Duke U Press. • Beaufort B. Longest. (2010). *Health Policy Making in the United States. Fifth Edition*. Health Administration Press.
Recommended web resources	George Washington University & Robert Wood Johnson Foundation. *Health Reform Glossary.* Available at: http://www.healthreformgps.org/glossary/ Think tanks: Center for American Progress; Brookings Institution; Cato Institute; Hoover Institution; Heritage Foundation Other Institutions: Henry J. Kaiser Foundation; Commonwealth Fund; Robert Wood Johnson Foundation; Health Affairs's "Health Policy Briefs" or Blogs; The Congressional Budget Office; Health and Human Services; The Centers for Disease Control; The National Center for Health Statistics; National Conference of State Legislatures; National Academy of State Health Policy; Institute of Medicine.

Syllabus content

- **COURSE OVERVIEW**
- **SCHOOL COMPETENCIES AND COURSE LEARNING OBJECTIVES**
- **COURSE POLICIES**
- **COURSE SCHEDULE**

COURSE OVERVIEW

This seminar course is designed to provide students with an overview of the structure, politics, and policies of health care delivery in the United States. The goal is to increase students' knowledge and abilities to analyze and address health care issues from both management and policy perspectives. This course will provide students with a hands-on opportunity to learn about the health policy development process in the United States. The course begins with a brief history of health care in the United States. Students will gain a deeper understanding of the myriad ways in which health policy are made through the judicial, legislative, and executive branches of government. Issues addressed by health policy tend to coalesce around a corner of the "iron triangle of health care": access, quality, and financing. The corners, or health care system goals, pertain to public- (i.e. Medicare, Medicaid, CHIP) as well as private-sponsored insurance programs. The course segues into an overview of rationales that affect Affordable Care Act, including genetic predisposition and social determinants of health. The course concludes with how to U.S. health care system fares relative to other national health care systems.

The course prepares students to understand and apply concepts in policy analysis, which entails communicating novel ideas through oral and written assignments. As such, students will gather into groups for a semester-long project, through which they will learn how to: (1) define a health care problem, (2) analyze different policy options, (3) conduct a stakeholder analysis, (4) develop an advocacy strategy or a set of recommendations, and 5) make a presentation based on a report documenting (1)-(4). Student groups will first choose a topic that is not exclusively covered in the course including, but not limited to, long-term care, mental health, oral health, the Veterans Administration Health System, and epidemics. Students will outline the various options already exercised to address this topic. They will then chart out the various stakeholders (i.e. media, advocates) working to shape the chosen health issue. Finally, students will design a campaign aimed at changing health policy. The instructor uses learning techniques that are interactive, encourages discussion of the current health reform debate, and prompts students to formulate solutions to problems inherent in the complex, evolving U.S. health care system.

Students will develop several important skills. First, students will develop communication skills through reflections on readings and a debate in class. Second, students will work on their writing skills through an individual fact sheet and a group policy papers. Finally, students will come to actively listen and to engage in respectful, productive dialogue with peers whose ideas and values may differ from their own. These skills will undoubtedly students to become 21st century leaders in the health sector.

SCHOOL OF PUBLIC HEALTH COMPETENCIES AND COURSE LEARNING OBJECTIVES

Competencies	Course Learning Objectives	Sessions and Assessments
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be addressed as part of the following course sessions and assessments:*
1. Apply principles of program planning, development, budgeting, management and evaluation in organizational and community initiatives	• Apply knowledge to policy and administrative decision-making. • Analyze an important health policy issue. • Discuss political, social, and economic feasibility issues related to said health policy issue.	Sessions: Weeks 9-11, 13, 14 Assessment: Policy analysis group assignment.
2. Discuss the legal and ethical bases for public health and health services	• Understand pass, current and emerging key issues in health care delivery in the United States. • Distinguish among various actors shaping the legal and ethical basis in U.S. health care delivery. • Explain quality and performance improvement concepts employed in public health organizations.	Sessions: Weeks 2, 9, 10 Assessment: Readings are curated to show the legal and ethical bases for public health, as reinforced with case examples.
3. Explain methods of ensuring community health safety and preparedness.	• Examine important public health issues, identify alternative policy approaches, and recommend at least one approach to addressing the issues. • Cogently discuss and debate complex health-related issues.	Sessions: Weeks 3-5 Assessment: Readings are curated to show how the iron triangle of health care can ensure population health.
4. Demonstrate leadership skills for building partnerships.	• Work effectively in a team with fellow students	Sessions: Weeks 9-11, 13, 14 Assessment: Present findings in writing, via the needs/strength assessment report, to

Competencies	Course Learning Objectives	Sessions and Assessments
		permission of community-based partner organization.
5. Apply systems thinking for resolving organizational problems.	• Understand the interrelationships of health care problems and other public health problems. • Explore interdependencies across units of analysis: individual, organization, community, and national. • Recognize the impact of environmental factors on health policy-making.	Sessions: Weeks 8, 11 Assessment: Readings are curated to show how systems theory and complexity science can information the analysis of U.S. health care system.
6. Discuss the policy process of improving the health status of populations.	• Explain the public policy-making process in the US using different health care examples. • Understand levels and branches of the US. government in assuring the health of the public. • Specify the role played by the government and other major stakeholders in health policy-making and delivery of health care services for the U.S. population. And identify the politics arising from the stakeholders' interaction.	Sessions: All weeks. Assessment: Readings are curated to describe the contextual forces that influences population health status.
7. Examine, analyze and explain the intended and unintended consequences of national policies and reforms.		Assessment: Instructor will help guide students' policy analysis through various assignments.
8. Demonstrate knowledge of political, economic and social context of health policies.	• Explain the basic organization, financing and delivery of health services in the U.S. • Discuss the facilitators and barriers to the attainment of three goals of the U.S. health care system: equity, access, and cost(-effectiveness).	Sessions: Weeks 9-11, 13, 14 Assessment: Students will be given the opportunity to choose a health issue, and to conduct an analysis of the policy addressing said issue through a semester-long project.

COURSE POLICIES

Communication*

Email Correspondence: The subject line of your email should be formatted as:

- For assignments: "HNSC 7142X – [the name of the assignment as it appears in this syllabus]."
- For all other matters: "HNSC 7142X – [purpose of the email, e.g. "Office Hours", "Appointment Request"]."

Failure to format emails according to the above guidelines might result in a delay. Please allow 24-48 hours for a response.

*Note that email is a *formal* means of communication with superiors and colleagues in the context of the university or place of employment. As such, get into the habit of reading your e-mail twice before send-off (or undo it as soon as a mistake is spotted), sign off every message, and always use polite language, capital letters where appropriate, punctuation marks, grammar, and syntax. E-mails should begin with greetings and end salutations. Please minimize the use of abbreviations and acronyms, and avoid using slang.

Academic Integrity*

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete test of the CUNY Academic integrity Policy and the Brooklyn College Procedures for implementing the policy can be found at http://www.brooklyn.cuny.edu/bc/policies. If I, or any other faculty member, suspects a violation of academic integrity and, upon investigation, confirms that violation, or if you, the student, admits the violation, the faculty member MUST report the violation. A copy of the Faculty Action Report is appended to this syllabus, which I WILL use to report ALL instances of cheating, plagiarizing, or any other type of academic dishonesty (see Appendix A).

You should carefully and thoroughly read the section entitled "Academic Regulations and Procedures" in the Brooklyn College Graduate Bulletin (http://www.brooklyn.cuny.edu/web/off_registrar/141024_2014-15_Graduate_Bulletin.pdf) for a complete listing of academic regulations of the College.

*Note that all of the assignments due in this course are subject to screening through SafeAssign, an anti-plagiarism tool.

Assistance with writing

The library maintains a collection of website links within the Research & Writing Help section that can assist you with proper citation format and paraphrasing and quoting other authors:

http://library.brooklyn.cuny.edu. Both the Learning Center (http://lc.brooklyn.cuny.edu) and the Health and Nutrition Sciences Department have writing tutors available to help you with your writing. Seek help early, should you need it, because an appointment's required!

Assistance with library research

The library maintains a collection of website links that can assist you with library searches:

- Health & Nutrition Subject Guide (http://library.brooklyn.cuny.edu/resources/?subject=hns)
- Library Research Guide for Nutrition (http://library.brooklyn.cuny.edu/resources/loop/research.php?s=250&c=942)
- Library Research Guide for Public Health (http://library.brooklyn.cuny.edu/resources/loop/research.php?s=250&c=948)

For further assistance please contact Lee Ann Fullington at LAFullington@brooklyn.cuny.edu or 718-758-8217.

Accessibility

In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with Ms. Valerie Stewart-Lovell, Director of the Center for Student Disability Services, at 718-951-5538. If you have already registered with the Center for Student Disability Services, please provide me, your professor, with the course accommodation form and discuss your specific accommodation with me.

Class citizenship and Rules of Conduct

Attendance

- Students are expected to attend all class sessions. In cases of personal emergency or illness I, the professor, must be notified.
- See p. 46 of the Graduate Bulletin regarding non-attendance due to religious beliefs. I, as the professor, must be notified in advance.
- Assignments are based on lectures and activities, as well as course readings. If you are absent from class it is *your responsibility* to contact a classmate for notes and other materials you missed.
- A record of attendance will be maintained with attendance taken throughout the semester.
- Written assignments must be submitted electronically by midnight on the due date. Absence from the session during which an assignment is due does not excuse or preclude you from turning in the assignment.

Lateness and Early Exits

- Please enter and exit the class with the least amount of disruption.
- You are expected to arrive on time for class. Tardiness and absences are disruptive to fellow students and your professor.
- Persistent tardiness and/or early exits will result in a grade reduction.

Other Classroom Etiquette

- Use of cell phones and other electronic media (e.g. video game consoles) is not permitted. Laptops or iPads that are used to take notes or making presentations are allowed; however, if your device is viewed as disruptive, you will be asked to put it away.
- Respect others and their opinions. Constructed a well-informed argument if you disagree.
- Be an avid participator in class discussions.

Assignments

Submission mode

Be sure to put a title, your name, and date at the top of each assignment. I expect assignments to be submitted electronically, specifically via email, by midnight of the due date. See guidelines for email correspondence in the next section.

Formatting

The following guidelines apply to all forthcoming assignments, in addition to assignment-specific guidelines that will be distributed:

- Title, name, and date (in that order) on the upper left corner of p.1
- Times New Roman or Garamond, 12pt font
- Single-spaced
- 1" margins all around
- Page numbers on the bottom right corner of each page
- References should appear as the last section in APA citation format (http://www.apastyle.org/), preferably with a section break inserted

Failure to format submissions according to the stated guidelines will result in an automatic half-grade reduction for the written assignment.

Description

The course consists of a group project, a midterm, and a final examination. Each student will be responsible for all assignments. A few notes on each:

- Class participation (15% for total grade) is encouraged and expected during the entire semester. It breaks down as a debate and leading two class discussion.
    - *Debate* (5% of class participation grade): 2016 election mock debate on health care issues where each student represents a presidential candidate.
    - *Discussion leader* (10% of class participation grade): For two sessions of your choosing, you are expected to (a) read the assignments, (b) prepare at least five discussion questions and at least five take-away points to be emailed to me at least one hour before each class session, and (c) facilitate discussion during class. Evaluations on your class participation will be based on your ability to prepare, make insightful and relevant comments, and ability to move the class discussion along

  If you are on the cusp between two grades, class participation and overall preparedness will be considered in making final grade determinations.

- Term-project (65% of total grade):

- *Paper* (55% of term project grade): Parts of the final paper will be due throughout the semester; my intent is so you get started working on it early. I will grade the draft each part and give you comments. I will adjust the percentage you receive on each draft to match the same part in the final paper, provided that your group adequately addresses my comment(s) in a matrix and the manuscript itself. In the event that your group chooses not to submit a certain part by the draft deadline, your draft grade will be the same as what's earned for that very part in the final paper. Be sure to take advantage of the library research and writing resources offered on campus, as stated above. See Appendix B for full project guidelines.
- *Presentation* (5% of term project grade): Presentation is based on the final paper. You are expected to pick up to five key references from said final paper, seek approval from me, and then share them with the class before your scheduled presentation date on May 10 or May 17.
- *Peer rating* (5% of term project grade): Submission of peer ratings using the form in Appendix C will automatically earn you 5% of the term project grade. If there are no disparities about member contribution, all group members will receive the same grade on the final paper. If there are disparities, I will take the average score given to you by your team members and weigh your report grade accordingly.

- Fact sheet (10% of total grade): My hope is that writing the fact sheet will make the debate less worrisome, especially for introverted students or those not comfortable with public speaking (yet). The fact sheet will help me assess the quality of your thoughts and level of preparedness. See guidelines in Appendix D.

Grading

Grading for the course will be based on a scale, as opposed to on a curve. Assignment due dates are noted in the course schedule section of this syllabus.

Students will be evaluated based on the following criteria:

Assignment	**Due date**	**Percentage**
Group Project		
Problem definition (draft)	Apr. 12	10
Policy options and evaluation criteria (draft)	Apr. 19	10
Stakeholder analysis (draft)	May 2	10
Peer evaluation	May 24	5
Final paper (including revised version of all sections above)	May 24	25
Presentation	May 10 or May 17	5
Fact sheet	Mar. 29	10
Class participation		
Debate	Mar. 29	5
Discussion leader (5%/session x 2 sessions)		10
Attendance		10
Total		**100**

Letter grading
The grading system (letter grad, quality points, percentage) for this course follows guidance in the Graduate Bulletin:

A+	4.0	97.5 - 100%	B+	3.3	87.5%-89.9%	C+	2.3	77.5%-79.9%
A	4.9	92.5 – 97.4%	B	3.0	82.5%-87.4%	C	2.0	70.0%-77.4%
A-	3.7	90 – 92.4%	B-	2.7	80.0%-82.4%	F	0	<70%

Extensions for assignments are not given unless planned with the professor *at least two weeks in advance* of the specified due date, otherwise the deadlines are firm and enforced by the date and time stamp on your email. Late or incomplete submission of assignments are not accepted. The assignments come together as a gestalt, so missing any assignment would render your final product incomplete. No make-ups, rewrites, and extra credit.

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Graduate Bulletin and the Program Director for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

COURSE SCHEDULE

Topic	Activities	Objectives	Assignments
Week 1 – February 2			
Introduction	Course overview Brief history of health care in the United States Policy analysis group project	• Go over how the course is structured • Give an overview of the breadth of material the course will cover • Preview the steps students will be expected to include as part of their policy analysis group exercise • Pique student interest in U.S. health policy so they will be think critically about health care issues. • Give a brief history of the US medical and public health systems • Introduce key concepts that will recue throughout the semester	Readings: 1. BG Ch. 1, 16 2. TW Ch 1 Optional readings: 1. Raff R. How to read and understand a scientific paper: a guide for non-scientists. Available at: http://violentmetaphors.com/2013/08/25/how-to-read-and-understand-a-scientific-paper-2/ 2. Reuben A. How to read a scientific paper. Available at: http://www.sciencemag.org/careers/2016/01/how-read-scientific-paper?utm_source=sciencemagazine&utm_medium=facebook-text&utm_campaign=scientificpaper-2042
Schedule note: February 9 is a Conversion Day, so class will not be held on that day.			
Week 2 – February 16			

Legislative and regulatory processes	Workshop: How to read a scientific paper	• Gain a basic understanding of the legislative process • Gain a basic understanding of the regulatory process • Explain the difference between the legislative and regulatory processes • Identify sources of authority for development and implementation of health policies • Understand the basic steps of policy-making	Readings: 1. BG Ch. 1 2. TW Chs. 1, 2, 3 Optional readings: I assume that you have background knowledge of the U.S. health system, so I did not assign readings on the U.S. legislative or regulatory process. If you need to brush up on this material, read about the federal and/or New York legislative rules at these sites: • Graham JD. (2002). An Overview of the U.S. Regulatory System. The White House Office of Management and Budget. https://www.whitehouse.gov/omb/inforeg_pres_mgmt_regulatory_state • Sullivan, John V. (2007). How Our Laws are Made. Revised and Updated. U.S. House of Representatives. Available at: http://thomas.loc.gov/home/lawsmade.toc.html • Enactment of a Law. U.S. Senate. Available at: http://www.senate.gov/legislative/common/briefing/Enactment_law.htm • Senate Legislative Process. U.S. Senate. Available at: http://www.senate.gov/legislative/common/briefing/Senate_legislative_process.htm • US House of Representatives. The legislative process. http://www.house.gov/content/learn/legislative_process/

			• A Guide to the Rulemaking Process. Prepared by the Office of the Federal Register. https://www.federalregister.gov/uploads/2011/01/the_rulemaking_process.pdf. • New York State Senate. How a Bill Becomes A Law. Available at: https://www.nysenate.gov/how-bill-becomes-law-1
Week 3 – February 23			
Iron triangle of health care – Part 1	Cost	• Give an overview of the U.S. health system • Describe the goals of health policy	Readings: 1. BG Chs. 2, 8, 9 2. TW Ch. 4 3. Berwick DM, Nolan TW, Whittington J. (2008). The triple aim: care, health, and cost. *Health Affairs*; 27(3): 759-769. 4. Commonwealth Fund. (2007). *Bending the Cost Curve: Options for Achieving Savings and Improving Value in U.S. Health Spending.* 5. Fuchs, V. R. (2010). Health Care Is Different—That's Why Expenditures Matter. *JAMA*, 303(18), 1859-1860. 6. Chernew, ME, et al. (2010). The Specter of Financial Armageddon – Health Care and Federal Debt in the United States. *NEJM* 362(13): 1166-1168. 7. Pauly MV, Sloan FA, Sullivan SD. (2014). An economic framework for preventive advice. *Health Affairs*; 33(11):2034-2040. Optional readings:

1. Gawande, A. (2009). The Cost Conundrum – What a Texas Town Can Teach us about Health Care". *The New Yorker*.
2. Keehan S et. al.. (2015). National Health Expenditure Projections 2014-24: Spending Growth Faster than Recent Trends. *Health Affairs*.
3. Carroll, A.E., "Forbidden Topic in Health Policfuchsy Debate: Cost Effectiveness," *The New York Times*. And other *New York Times* series on health care costs
4. Hartman, M., et al. (2014). National Health Spending in 2013: Growth Slows, Remains in Step with the Overall Economy. *Health Affairs*.
5. OECD. Health care systems: efficiency and policy settings. Available at: http://www.oecd.org/eco/healthcaresystemsefficiencyandpolicysettings.htm
6. Fuchs, V. R., & Milstein, A. (2011). The $640 billion question—why does cost-effective care diffuse so slowly?. *New England Journal of Medicine*, 364(21), 1985-1987.
7. Berwick, D. M., & Hackbarth, A. D. (2012). Eliminating waste in US health care. *JAMA*, 307(14), 1513-1516.
8. Milstein, A., & Shortell, S. (2012). Innovations in care delivery to slow growth of US health spending. *JAMA*, 308(14), 1439-1440.
9. Fisher, E. S., Wennberg, D. E., Stukel, T. A., Gottlieb, D. J., Lucas, F. L., & Pinder, E. L. (2003). The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care. *Annals of Internal Medicine*, 138(4), 273-287.

Week 4 – March 1			
Iron triangle of health care – Part 2	Access	• Give an overview of the U.S. health system • Describe the goals of health policy	Readings: 1. BG Ch. 3 2. Ponce, N. A., Hays, R. D., & Cunningham, W. E. (2006). Linguistic disparities in health care access and health status among older adults. *Journal of General Internal Medicine*, 21(7), 786-791. 3. Snowden, L. R., & Cheung, F. K. (1990). Use of inpatient mental health services by members of ethnic minority groups. *American Psychologist*, 45(3), 347. 4. Wang, P. S., Berglund, P., Olfson, M., Pincus, H. A., Wells, K. B., & Kessler, R. C. (2005). Failure and delay in initial treatment contact after first onset of mental disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62(6), 603-613. 5. Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: does it matter?. *Journal of Health and Social Behavior*, 1-10. 6. Starfield, B., & Shi, L. (2002). Policy relevant determinants of health: an international perspective. Health Policy, 60(3), 201-218. Optional reading: 1. Wagstaff, A., & Van Doorslaer, E. (2000). Equity in health care finance and delivery. *Handbook of Health Economics*, 1, 1803-1862. 2. Andersen, R. M., McCutcheon, A., Aday, L. A.,

			Chiu, G. Y., & Bell, R. (1983). Exploring dimensions of access to medical care. *Health Services Research*, 18(1), 49. 3. Fisher, E. S., Wennberg, D. E., Stukel, T. A., Gottlieb, D. J., Lucas, F. L., & Pinder, E. L. (2003). The implications of regional variations in Medicare spending. Part 2: health outcomes and satisfaction with care. *Annals of Internal Medicine*, 138(4), 288-298. 4. Bongaarts J. 2015. *The Growing Gap in Life Expectancy by Income: Implications for Federal Programs and Policy Responses*. Washington DC: National Academy of Sciences.
Week 5 – March 8			
Iron triangle of health care – Part 3	Quality	• Give an overview of the U.S. health system • Describe the goals of health policy	Readings: 1. BG Ch. 10 2. TW Ch. 11 3. The Institute of Medicine. Crossing the quality chasm: a new system for the 21st century. Executive summary. Available at: http://www.nap.edu/catalog.php?record_id=10027 4. McGlynn E et al. (2003). The quality of health care delivered to adults in the United States. *NEJM*; 348 (26): 2635-45. 5. Berwick, D. M., Godfrey, B. A., & Roessner, J. (1991). Curing Health Care: New Strategies for Quality Improvement. *Journal for Healthcare Quality*, 13(5), 65-66. 6. Casalino, L., Gillies, R. R., Shortell, S. M., Schmittdiel, J. A., Bodenheimer, T., Robinson, J. C., ... & Wang, M. C. (2003). External incentives, information technology, and

organized processes to improve health care quality for patients with chronic diseases. *JAMA*, 289(4), 434-441.
7. Shortell, S. M., O'Brien, J. L., Carman, J. M., Foster, R. W., Hughes, E. F., Boerstler, H., & O'Connor, E. J. (1995). Assessing the impact of continuous quality improvement/total quality management: concept versus implementation. *Health Services Research*, 30(2), 377.

Optional reading:

1. No Correlation Between Quality and Cost-Effectiveness Among Medicare ACOs – *Avalere*
2. Gawande A. (2013). Big Med. New Yorker.
3. McGlynn EA. (1997). Six Challenges in Measuring the Quality of Health Care. *Health Affairs* 16(3): 7-21.
4. Powers BW, Cassel CK, Jain SH. Ending the cycle of blame in US health care. *JAMA*; 312: 2091-2092.
5. Hubbard T, Bartolini E, Paradis S, Sabouri S. (2014). An evolving landscape: comparative effectiveness research, outcome research and care innovation. NEHI brief. Available at: http://www.nehi.net/writable/publication_files/file/outcomes_research_and_health_care_innovation_-_may_20_copy1.pdf
6. Schuster, M. A., McGlynn, E. A., & Brook, R. H. (1998). How good is the quality of health care in the United States?. Milbank Quarterly,

			76(4), 517-563.
Week 6 – March 15			
			Watch PBS FRONTLINE "Obama's Deal" at: http://www.pbs.org/wgbh/pages/frontline/obamasdeal/view/
Week 7 – March 22			
Health insurance – Part 1	Private insurance, including group, non-group, fee-for-service, and managed care.	• Understand the history of private insurance coverage • Understand the types of private health insurance coverage • Understand some of the main problems in health insurance (i.e. moral hazard, adverse selection) • Understand how different actors (i.e. employers, individuals, insurers) have responded to rising health care costs	Readings: 1. BG Chs. 4-6 2. TW Ch. 7, 9 3. Kaiser Family Foundation and Health Research and Education Trust. 2015 Employer Health Benefits: Summary of Findings. Available at: http://kff.org/report-section/ehbs-2015-summary-of-findings/ 4. Newhouse, J. P. (2004). Consumer-directed health plans and the RAND Health Insurance Experiment. *Health Affairs*, *23*(6), 107-113. 5. Gruber, J., & Simon, K. (2008). Crowd-out 10 years later: Have recent public insurance expansions crowded out private health insurance?. *Journal of Health Economics*, *27*(2), 201-217. Optional readings:

			1. Colombo, F., & Tapay, N. (2004). *Private health insurance in OECD countries*. Available at: http://search.oecd.org/els/health-systems/33698043.pdf 2. National Bureau of Economic Research, *Employer Sponsored Health Insurance and Health Reform*. Avaiolable at: http://www.nber.org/bah/2009no2/w14839.html 3. Furman, J. (2008), "Heath Reform Through Tax Reform: A Primer," Health Affairs 27(3): 622-632 4. Pauly, M.V., and S.E. Harrington (2013), "Private Health Insurance Exchanges," Health Management, Policy and Innovation 1(4): 61-72. 5. Association Between Availability of Health Service Prices and Payments for These Services – JAMA
Week 8 –March 29			
Health insurance – Part 2	Medicaid, CHIP, Medicare, and the uninsured	• Gain a basic understanding of Medicaid, Medicare, and CHIP history, finance mechanisms, eligibility and covered services • Understand the demographics of the uninsured • Understand the health and financial consequences of being uninsured • Understand the underinsured phenomenon • Learn about nonfinancial barriers to health care access (racial and ethnic disparities in care, language, geography, disabilities) • Distinguish the four different Medicare components (Part A, B, C, and D)	Readings: 1. BG Ch. 15 2. TW Ch. 10 3. Blumentahl D, Davis K, Guterman S. (2015). Medicare at 50—Moving Forward. *NEJM*;372(7):671-677. 4. Iglehart JK, Sommers B. (2015). Medicaid at 50—From Welfare Program to Nation's Largest Health Insurer. *NEJM*;372(22):2152-2159. Available 5. Kaiser Commission on Medicaid and the Uninsured. (2013). *Medicaid: A Primer*. Available

			at: https://kaiserfamilyfoundation.files.wordpress.com/2010/06/7334-05.pdf 6. Kaiser Commission on Medicaid and the Uninsured. (2015). *The Uninsured: A Primer*. Available at: http://files.kff.org/attachment/the-uninsured-a-primer-key-facts-about-health-insurance-and-the-uninsured-in-america-primer Optional readings: 1. Gladwell, M. (2005). The Moral Hazard Myth. *The New Yorker*. 2. Medicare Advantage: Moving Toward A Better Model For American Health Care – *Forbes* 1. Medicare Is Not "Bankrupt" – Health Reform Has Improved Program's Financing - CBPP
Week 9 –April 5			
Health care reform: past, present, future.	Mock presidential debate on Affordable Care Act. Workshop: Preview to policy analysis	• Understand the role of politics in shaping health policy • Understand new coverage options available under the ACA (including Medicaid expansion and insurance exchanges) • Know which states are expanding Medicaid and creating own state-based Exchanges • Understand other health insurance mandates (i.e. essential benefits package, coverage for people with pre-existing conditions)	Readings: 1. Presidential candidates have diverging views on health care. Collect and read at least <u>five</u> sources that would give you a good idea of your candidate's view on the Affordable Care Act. These sources can be the popular press, candidate website, transcript of speeches they have given, televised debates, social media, etc.. 2. TW Chs. 9, 13 3. Walt, G., Shiffman, J., Schneider, H., Murray, S. F., Brugha, R., & Gilson, L. (2008). 'Doing' health policy analysis: methodological and conceptual reflections and challenges. *Health Policy and Planning*, 23(5), 308-317.

Week 10 – April 12			
Advocacy campaigns	Framing issues based on the equity, life course, genetic predisposition, socioecological model. Workshop: Problem definition using the 27-9-3 rules of 27 words, 9 second, 3 points (Bardach Steps 1 and 2)	• Identify factors that influence an individual's life course and the relationship to health outcomes • Discuss the role of the life course perspective in developing and implementing of health policy •	Readings: 1. BG Ch. 11 2. TW Ch. 5 3. Dorfman, L., Wallack, L., & Woodruff, K. (2005). More than a message: Framing public health advocacy to change corporate practices. *Health Education & Behavior*, 32(3), 320-336. 4. Halfon, N., & Hochstein, M. (2002). Life course health development: an integrated framework for developing health, policy, and research. *Milbank Quarterly,* 80(3), 433-479. 5. Mechanic, D., & Tanner, J. (2007). Vulnerable people, groups, and populations: societal view. *Health Affairs*, *26*(5), 1220-1230. 6. Lantz PM, Lichtenstein RL & Pollack HA. (2007). Health policy approaches to population health: the limits of medicalization. *Health Affairs*;26(5): 1253–1257. 7. Bayer, R., & Colgrove, J. (2002). Science, politics, and ideology in the campaign against environmental tobacco smoke. *American Journal of Public Health*, *92*(6), 949-954. 8. Oliver, TR. (2006). The Politics of Public Health Policy. *Annual Review of Public Health*; 27:195

			Optional readings: 9. Freudenberg, N. (2005). Public health advocacy to change corporate practices: implications for health education practice and research. *Health Education & Behavior*, 32(3), 298-319. 10. Bayer, R. (2008). Stigma and the ethics of public health: not can we but should we. *Social Science & Medicine*, 67(3), 463-472. 11. Jahiel, R. I., & Babor, T. F. (2007). Industrial epidemics, public health advocacy and the alcohol industry: lessons from other fields. *Addiction*, 102(9), 1335-1339. 12. Robinson, T. (2008). Applying the socio-ecological model to improving fruit and vegetable intake among low-income African Americans. *Journal of Community Health*, 33(6), 395-406. 13. Marmot, M. (2005). Social determinants of health inequalities. *The Lancet*, 365(9464), 1099-1104. 14. Sacks R, Yi S, Nonas C. (2015). Increasing Access to Fruits and Vegetables: Perspectives from the New York City Experience. *American Journal of Public Health*;105(5):e29-e37. 15. Barrio PJ, Goldstein DG, Hofman JM. Improving the comprehension of numbers in the news.
Week 11 – April 19			
Agenda- and Priority-	Debate: Human rights vs. free-market for	• Recognize frameworks, theories or approaches to explaining the policy process	Deadline (by midnight): Problem definition. Readings:

Setting	pharmaceuticals. Workshop: Policy options and evaluation criteria (Bardach Steps 3-8)	1. BG Ch. 13 2. TW Ch. 6 3. Scheufele, D. A., & Tewksbury, D. (2007). Framing, agenda setting, and priming: The evolution of three media effects models. Journal of Communication, 57(1), 9-20. 4. Trouiller, P., Torreele, E., Olliaro, P., White, N., Foster, S., Wirth, D., & Pécoul, B. (2001). Drugs for neglected diseases: a failure of the market and a public health failure?. *Tropical Medicine & International Health*, 6(11), 945-951. 5. Shiffman, J., & Smith, S. (2007). Generation of political priority for global health initiatives: a framework and case study of maternal mortality. *The Lancet*, 370(9595), 1370-1379. 6. Baltussen, R., & Niessen, L. (2006). Priority setting of health interventions: the need for multi-criteria decision analysis. *Cost Effectiveness and Resource Allocatio*n, 4(1), 14. 7. Keller, A. C. (2009). Credibility and relevance in environmental policy: Measuring strategies and performance among science assessment organizations. *Journal of Public Administration Research and Theory*, mup001. Optional readings: 16. Agrawal S, Brennan N, Budetti P. The Sunshine Act – Effects on Physicians. *NEJM*. May 30, 2013;368(22):2054-2057. 17. The Real Cost of "High Priced" Drugs – *NEJM/HBR* 18. Fiscal Footnote: Big Senate Gift to Drug

			Maker – *New York Times* 19. Green-Pedersen, C., & Wilkerson, J. (2006). How agenda-setting attributes shape politics: basic dilemmas, problem attention and health politics developments in Denmark and the US. *Journal of European Public Policy*, 13(7), 1039-1052. 1. Daniels, N. (2000). Accountability for reasonableness: Establishing a fair process for priority setting is easier than agreeing on principles. *BMJ: British Medical Journal*, 321(7272), 1300.
Schedule note: April 26 is Spring Break.			
Week 12 – May 3			
Accountable Care Organizations	Workshop: Stakeholder analysis	• Learn about insurance protections built into the Affordable Care Act • Learn about the extent to which the Affordable Care Act addresses three policy goals.	Deadline (by midnight): Policy options and evaluation criteria. Readings: 1. Fisher, E. S., & Shortell, S. M. (2010). Accountable care organizations: accountable for what, to whom, and how. *JAMA*, 304(15), 1715-1716. 2. Hacker, K., & Walker, D. K. (2013). Achieving population health in accountable care organizations. *American Journal of Public Health*, 103(7), 1163-1167. 3. Chukmaitov, A., Harless, D. W., Bazzoli, G. J., Carretta, H. J., & Siangphoe, U. (2015). Delivery system characteristics and their association with quality and costs of care:

Implications for accountable care organizations. *Health Care Management Review*, 40(2), 92-103.
4. Brugha, R., & Varvasovszky, Z. (2000). Stakeholder analysis: a review. *Health Policy and Planning*, 15(3), 239-246.

Optional readings:

2. Mihlestein D. (2015). Growth and dispersion of accountable care organizations in 2015. Available at: http://healthaffairs.org/blog/2015/03/31/growth-and-dispersion-of-accountable-care-organizations-in-2015-2/
3. Centers for Medicare & Medicaid Services (CMS), HHS. (2011). Medicare program; Medicare Shared Savings Program: Accountable Care Organizations. Final rule. Federal Register, 76(212), 67802.
4. Fisher, E. S., Staiger, D. O., Bynum, J. P., & Gottlieb, D. J. (2007). Creating accountable care organizations: the extended hospital medical staff. *Health Affairs*, 26(1), w44-w57.
5. Hyder, A., Syed, S., Puvanachandra, P., Bloom, G., Sundaram, S., Mahmood, S., ... & Pariyo, G. (2010). Stakeholder analysis for health research: case studies from low-and middle-income countries. *Public Health*, 124(3), 159-166.
6. Press, M. J., Michelow, M. D., & MacPhail, L. H. (2012). Care coordination in accountable care organizations: moving beyond structure

		and incentives. The *American Journal of Managed Care,* 18(12), 778-780. 7. Burke G. (2013). Accountable Care Organizations in New York. NY: United Hospital Fund. 8. Fewer Hospitals May Lead to Higher Prices. *TIME* 9. F.T.C. Wary of Mergers by Hospitals. *New York Times*. 10. How a secretive panel uses data that distorts doctors' pay – *Washington Post* 11. Rosenthal, E. (2014), "The Odd Math of Medical Tests: One Scan, Two Prices, Both High," *The New York Times* 12. Pauly M.V., and L. R. Burns (2008), "Price Transparency for Medical Devices," *Health Affairs* 27(6): 1544-1553. 13. A More Complete Picture of Pioneer ACO Results – *Brookings* 14. Fisher, E. S., Shortell, S. M., Kreindler, S. A., Van Citters, A. D., & Larson, B. K. (2012). A framework for evaluating the formation, implementation, and performance of accountable care organizations. *Health Affairs*, 31(11), 2368-2378.
Week 13 – May 10		
Health care systems around the world	• Compare the US and peer countries' health systems • Attempt to explain the differences in population health outcomes • Recommend appropriate response related to research and policy	Deadline (by midnight): Stakeholder analysis draft. Readings: 1. BG Ch. 14 2. Hsiao, W., & Burgess, C. (2009). *Building on Health Systems Frameworks for Developing a*

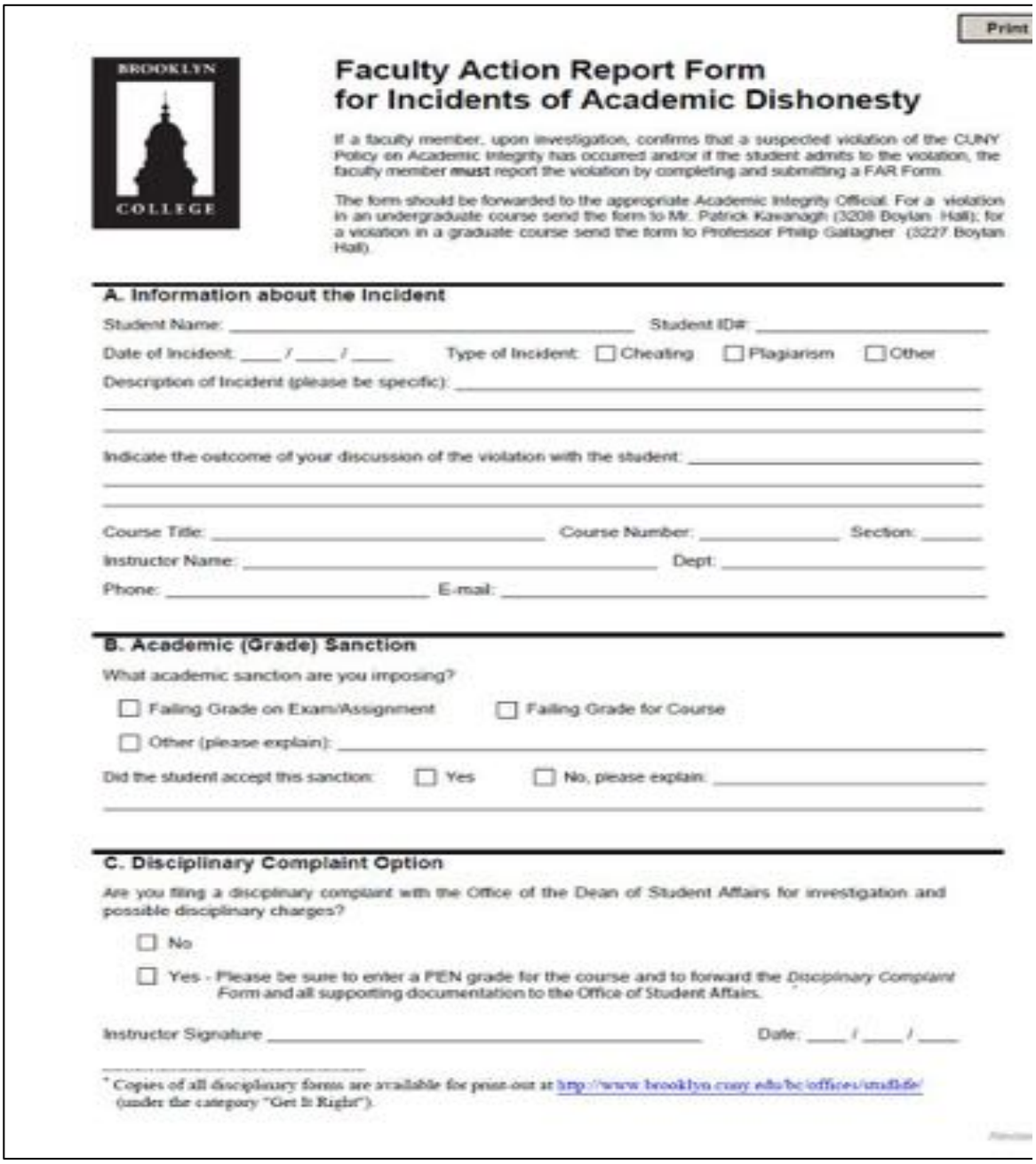
Common Approach to Health Systems Strengthening. World Bank.
3. Macinko, J., Starfield, B., & Shi, L. (2003). The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970–1998. *Health Services Research*, 38(3), 831-865.
4. Reid, T. R. (2010). The healing of America: A global quest for better, cheaper, and fairer health care. Penguin. Pp. 1-45.

Optional readings:

1. World Health Organization. (2007). Everybody's business--strengthening health systems to improve health outcomes: WHO's framework for action.
2. Woolf, S. H., & Aron, L. (Eds.). (2013). *US Health in International Perspective:: Shorter Lives, Poorer Health*. National Academies Press.
3. Travis, P., Bennett, S., Haines, A., Pang, T., Bhutta, Z., Hyder, A. A., ... & Evans, T. (2004). Overcoming health-systems constraints to achieve the Millennium Development Goals. *The Lancet*, 364(9437), 900-906.
4. Institute of Medicine. (2013). *US Health in International Perspective*. Available at: http://iom.nationalacademies.org/Reports/2013/US-Health-in-International-Perspective-Shorter-Lives-Poorer-Health/Report-Brief010913.aspx
5. Starfield, B. (2000). Is US health really the best

		in the world?. *JAMA*, 284(4), 483-485. 6. Thomson, S. (Ed.). (2012). *International profiles of health care systems, 2014*. Commonwealth Fund. Available at: http://www.commonwealthfund.org/~/media/files/publications/fund-report/2015/jan/1802_mossialos_intl_profiles_2014_v7.pdf 7. Waldron H. 2007. Trends in mortality differentials and life expectancy for male social security –covered workers, by average relative earnings. ORES Working Paper No. 108. Social Security Office of Policy. Available at: https://www.ssa.gov/policy/docs/workingpapers/wp108.html 8. OECD, World Bank, WHO health statistics.
Week 14 – May 17		
Group 2-led discussion	• Gain an understanding of a health issue not already discussed.	Readings as determined by students in Group 2. *Please share list of readings with Prof. Shen, then circulate readings at least one week in advance, or prior to May 10.
May 24 - Final Examination	Deadline (by 8PM): Group paper.	

Appendix A: Brooklyn College Faculty Action Report for Incidents of Academic Dish



Print

BROOKLYN COLLEGE

Faculty Action Report Form for Incidents of Academic Dishonesty

If a faculty member, upon investigation, confirms that a suspected violation of the CUNY Policy on Academic Integrity has occurred and/or if the student admits to the violation, the faculty member **must** report the violation by completing and submitting a FAR Form.

The form should be forwarded to the appropriate Academic Integrity Official. For a violation in an undergraduate course send the form to Mr. Patrick Kavanagh (3208 Boylan Hall); for a violation in a graduate course send the form to Professor Philip Gallagher (3227 Boylan Hall).

A. Information about the Incident

Student Name: _____ Student ID#: _____

Date of Incident: ____ / ____ / ____ Type of Incident: ☐ Cheating ☐ Plagiarism ☐ Other

Description of Incident (please be specific): _____

_____

_____

Indicate the outcome of your discussion of the violation with the student: _____

_____

_____

Course Title: _____ Course Number: _____ Section: _____

Instructor Name: _____ Dept: _____

Phone: _____ E-mail: _____

B. Academic (Grade) Sanction

What academic sanction are you imposing?

☐ Failing Grade on Exam/Assignment ☐ Failing Grade for Course

☐ Other (please explain): _____

Did the student accept this sanction: ☐ Yes ☐ No, please explain: _____

_____

C. Disciplinary Complaint Option

Are you filing a disciplinary complaint with the Office of the Dean of Student Affairs for investigation and possible disciplinary charges?

☐ No

☐ Yes - Please be sure to enter a PEN grade for the course and to forward the *Disciplinary Complaint Form* and all supporting documentation to the Office of Student Affairs.

Instructor Signature _____ Date: ____ / ____ / ____

* Copies of all disciplinary forms are available for print-out at http://www.brooklyn.cuny.edu/bc/offices/studlife/ (under the category "Get It Right").

Appendix B

HNSC 4300: Organization, Administration, and Supervision of Health Services
Group Project Guidelines[1]

Professor Gordon Shen
Spring 2016

Deadlines: This assignment, worth 65% of your course grade, includes six sub-assignments as outlined:

Sub-assignment	Deadline	% of assignment grade
Problem definition (draft)	Apr. 12	10
Policy options and evaluation criteria (draft)	Apr. 19	10
Stakeholder analysis (draft)	May 2	10
Peer evaluation	May 24	5
Final paper (including revised version of all sections above)	May 24	25
Presentation	May 10 or May 17	5

All submissions should be done by email.

Aim: To work in a group on an analysis of a health policy problem.

Assignment Description
Students will work in a group of three to four students on a health policy problem. Each group is given the opportunity to choose a particular health policy problem not exclusively covered in this course including but not limited to: long-term care, oral health, behavior health, patient safety, hospital acquired infections, pharmaceuticals, aging, health informatics and electronic medical records, rural health, health technology (mHealth, devices), disaster preparedness, or Veteran's Administration. The project has five parts, which come together as a gestalt. In other words, the final paper consists of:

1. Defining the problem, or a description of the problem;
2. Analyzing and selecting a policy option (April 19, 2016 deadline), which entails presenting:
    a. At least four different policy options to address the underlying problem (one of which is maintaining the status quo);
    b. At least three evaluation criteria you plan on using (including those listed below), and how you will use the evaluation criteria to evaluate the different options (eg, on a scale of 1-5, with 5 being best, and 1 being worst),

[1] Note: This assignment was adapted from Prof. Pam Silberman for her UNC Chapel Hill course HPM 754 "Health Care in the United States: Structure and Policy" in Fall 2015.

c. An evaluation of the different policy options using your selected evaluation criteria. This should be presented in both a matrix and written format.

3. A stakeholder analysis, in which you should think about the stakeholder positions for the other proposed solutions that will affect the political feasibility of the different options.
4. Final policy recommendation, which you will submit with the rest of the final paper.

Sub-Assignment Description

Problem Definition
*Based on Bardach Steps 1 & 2

Each student group will write a 2.5-5 single-spaced or 5-10 page double-spaced paper that:

a. Describes the problem you want to address. Include information on who the problem affects, how many people are affected, and why there is a problem in the first place. On the first facet, it is important to note the number of people who will be assisted through the proposed policy.
b. Identifies any programs/systems that exist to address the problem. Include a description of the existing programs/systems (e.g., services provided, people covered, funding sources, etc.) and gaps or limitations in existing programs/systems.
c. Describes your policy goals. What do you want to accomplish? Where can the policy best be addressed?
    i. Legislative, regulatory, courts
    ii. Federal, state, county or local level

Policy Analysis
*Based on Bardach Steps 3-8

Each group will prepare a 2.5-5 single-spaced or 5-10 page double-spaced paper that compares different policy options to address their problem by:

a. Includes a short description of at least four alternative policy options that could address their problem. At least one of these options should be to maintain the status quo. For each policy option, you should:
    i. Describe the option, and project how it will impact on the problem (projecting outcomes)
    ii. Describe whether the policy has been implemented elsewhere, and if so, what the experience has been (including any evaluations of the option)
    iii. You should try to include information needed to assess the different the policy options.
b. Includes at least three evaluation criteria the student will use to compare the different policy options including cost and other resources needed to implement each policy option, ease of implementation including political feasibility, and number of people that will be helped by each policy option. For instance, with cost, you do not need to come up with exact cost estimates, just high, medium or low will be sufficient. I just want you to think about the potential implications for the different policy options.
c. Present your analysis of the different policy options using the evaluation criteria chosen. Present in both matrix and in descriptive format.

Stakeholder Analysis

Each student group will prepare a stakeholder analysis of the different options considered. The stakeholder analysis should be in grid form and have the following information for each of the different policy options considered above:

a. Will the group be a supporter or opponent? (For ease of presentation, you might want to separate the supporters from opponents). Will they offer strong support, moderate support, neutral, moderate opposition, or strong opposition?
b. What is their reason for supporting or opposing your recommended policy option?
c. How powerful is the group? Are they very powerful, somewhat powerful, or weak? (Note: this is closely connected with the next point).
d. What are the resources that this group can bring to the effort? (e.g., can they set policy themselves (policy makers), do they have a PAC or make substantial financial contributions to candidates, do they have lobbyists, personal connections to policy makers, ability to mobilize grassroots, provide information/research, etc.)
e. What is the likelihood of this group getting involved in this issue (very likely, somewhat likely, or not likely). Note: Just because a group has an "interest" in an issue does not mean that they will use their political capital to actively engage in the issue.
f. How can you influence the stakeholders' positions? Can you compromise to neutralize your opponents or to get them to support your position (remember, not all compromises are good compromises—some would undermine what you are trying to accomplish)? Alternatively, can you find supporters even within your larger group of opponents—for example, if business and industry will oppose as a group, are there any businesses that would support your position who can counter their industry position?

For example, if you are in a group working on expanding dental care access, your group would fill out the grid from the perspective of low-income consumer groups, dental society, hygienists' association, Blue Cross and Blue Shield, and the association of community health centers.

Final Recommendation

Each student group will write a 1-2 single-spaced or 2-4 page double-spaced paper that:

a. Choose one option
b. Indicate the approximate number of people affected by the policy option
c. Political feasibility of this option based on your stakeholder analysis
d. Costs of policy option based on your evaluation criteria

Final paper

The sub-assignments culminate to eight parts for the final paper:

1) A description of the public health problem that you are examining
2) At least four different policy options to address the underlying problem (one of which is maintaining the status quo)
3) A description of at least three criteria used for evaluating the policies
4) An evaluation of the different policy options using the selected evaluation criteria. (This should be presented in both a matrix and written format.)

5) A stakeholder analysis: groups only have to submit the stakeholder analysis for the recommended policy, not the alternatives.
6) A recommendation for a policy
7) An executive summary
8) A list of references

Style

- Length of the final paper is 4000-5000 words, or roughly 8 pages single-spaced/16 pages double-spaced to 10 pages single-spaced/20 pages double-spaced.
- 12-point Times New Roman or Garamond font.
- Standard 1" margins.

Grading

A few additional notes on how I will grade on the assignment described above:

- Clearly written paper with topics arranged logically. The analysis should include: a description of the problem, explanation of the different policy options you considered, stakeholder analysis, evaluation of the different policy options using your selected evaluation criteria, and final recommendations.
- Your policy brief should also include visual aids (i.e. well-designed tables and figures) that convey relevant, important information.
- Stakeholder analysis. You should be able to articulate the stakeholder's perspective on the different policy alternatives, along with an explanation of why they are likely to support/oppose those options, resources they bring to the table, and likelihood of getting involved in a particular policy debate.
- Evidence-informed recommendations. Your policy brief should include realistic policy alternatives designed to address the problem, and you should be able to articulate how you applied the different evaluation criteria to the policy options to recommend a specific policy. Your analysis should be based on data, to the extent possible, or reasonable assumptions of the outcomes of different policy options.
- Effective presentation, clearly presented, within the specified time limits for oral presentation and space constraint for the written paper.

Peer Rating: This is a group assignments so one grade will be given per group. However, each student's grade is weighted based on the average percentage assigned by his/her group members. This system is designed to encourage every person participate sufficiently in his/her group!
The UNC Writing Center is available to help students with writing, if you need assistance. They have helpful information on their website at: http://writingcenter.unc.edu/handouts/.
Note also that students will complete a peer evaluation that assesses their own and their teammates' contributions to the project. Your final grade will factor in your peer evaluations. Students who do not contribute appropriately will have their score lowered.

General Advice

- Redacted examples will be made available on Blackboard.
- Use resources from the library, Internet, and course materials. You must include a reference list of these resources accordingly to APA format.

- Integrate concepts from course lectures and readings, and from other academic and professional literature.
- Meet with me at least during the semester to discuss their policy paper and potential policy options.
- I do not meddle in intra-group affairs, but you are advised to divide up the scope of work in a fair, more so than equitable, manner.
- Each group member should proofread the entire document before submission.
- You should set up at least two meetings:
    1) In the first three weeks, after you have done some initial research on the problem and as you are identifying potential policy options to consider to address your policy problem and appropriate evaluation criteria.
    2) And again before finalizing their policy analysis—to discuss how the different policy options meet the specified evaluation criteria and to discuss different stakeholder positions.
- The Writing Center and Health and Nutrition Science (HNSC) Department offers free help with different aspects of writing as you are developing this policy analysis paper. However, you should make appointment at either or both places at the beginning of the semester before slots are filled. To make the best use of your time there, bring a copy of your policy analysis guidelines and either an outline or draft with you. Neither The Writing Center nor the HNSC writing tutor will proofread papers or talk with you about grades.
- Students are expected to conduct all academic work in the spirit of the CUNY Academic integrity Policy.
- Consult with me, the graduate student handbook and other sources to clarify the meaning of plagiarism. All team members share the responsibility of identifying and properly attributing credit to sources used in all graded work.
- Report any instance in which reasonable grounds exist to believe that a fellow team member has violated CUNY's honor code.
- Treat all team members with respect.

Appendix C

TEAM PROJECT PEER EVALUATION

Rater (Your Name)	Team Organization

PART I: TEAM RATING

Instructions: Complete the following rating form with regard to your team project members and their contributions to the project. For each item, rate your team as a whole on a scale of 1 (poor) to 5 (excellent).

	1 Poor	2 Fair	3 Good	4 Very Good	5 Excellent
Reliably attended team meetings (and communicated with me if unable to do so)					
Communicated well in accordance with the norms we established as a team					
Fulfilled his/her responsibilities as determined during planning and/or subsequent discussions					
Met internal team deadlines					
Made useful contributions during brainstorming and/or task completion					
Made him/herself available to support me as needed					
Offered criticism that was constructive rather than disruptive					
Maintained a collaborative attitude					
Responded constructively to feedback					
Made quality contributions to the team's final deliverables					

PART II. TEAM MEMBER RATING

Note: Please do not evaluate yourself.

NAME OF TEAM MEMBER	% (out of 100)
1._____	_____
2._____	_____
3._____	_____
4._____	_____

PART III: DISTRIBUTION OF WORK

Provide a short explanation of the contributions (or lack of contributions) of your team members. **Please describe any social loafing (i.e., slacking off) or backup (i.e., helping) behaviors that you observed**. ***Indicate your contributions as well in your written description.*** The evaluation of group members is to be based on the following:

- ***Intellectual Contribution:*** The extent to which the each member (including you) contributed intellectually to preparing and writing the report (i.e., ***came up with ideas*** for the project/report). You may *also* discuss any intellectual contributions devoted to dealing with the challenges of working on your team project (e.g., if you came up with solutions for handling problems).
- ***Physical and intellectual Effort***: Extent to which each group member (including you) was willing to ***spend the time and effort*** to communicate with their partner, coordinate with sources, gather other materials for the report, and write/edit the report.

PART IV: OTHER/MISC.

Is there anything else you would like me to know about this team member's performance that was not adequately captured in the items above?

Appendix D

HNSC 4300: Organization, Administration, and Supervision of Health Services
Fact Sheet Guidelines[2]

Professor Gordon Shen
Spring 2016

Deadline: March 29, 2016

Aim: To write a fact sheet that will prepare you for a class discussions, possibly debate, on the 2016 presidential candidates' stance on the Affordable Care Act.

Description
Writing skills are a crucial to have for you to be successful as a public health, health care management, and/or medical professionals. Through this assignment, students will each produce a one- to two-page fact sheet on the Affordable Care Act (ACA) and proposed reform to it from the perspective of a presidential candidate in 2016 election race. Each student will be assigned to represent one presidential candidate. You should do research to examine the candidate's position on health care issues as a background to their outlook on the Affordable Care Act. Note that his/her policy position may be influence by special interest group(s) and/or experience with health reform in specific state(s) or at the national level.

The fact sheet should be easy to read, written for a lay person, and make a clear argument from the perspective of your presidential candidate. The fact sheet should crudely support or oppose the ACA as it exists today. If the candidate is opposed to the ACA, what is an alternate option promoted? Good fact sheets generally have limited (i.e. three) number of points they convey in support of a certain position.

Style-wise, bear in mind the following. Fact sheets should be:

- Concise, or no more than two-single spaced pages, although one page is better;
- Easy to read, with key points or arguments bulleted;
- Grammatically correct, which means free of typos and other errors, and
- Logically constructed.

You are welcomed to submit an example facet sheet which you modeled the format of yours after.

Grading
This assignment is worth 10% of your course grade. I will grade fact sheets based on the following rubric criteria:

[2] Note: This assignment was adapted from Prof. Pam Silberman for her UNC Chapel Hill course HPM 754 "Health Care in the United States: Structure and Policy" in Fall 2015.

- Clearly written facet sheet that presents one or more plausible arguments from the perspective of your presidential candidate (40% of fact sheet grade)
- Written so that it is understandable to a lay person (20% of fact sheet grade)
- Attractive format so that a legislator/policy maker would want to read it. For example, topics should be arranged logically. Tables and figures should be well-designed and convey relevant, important information. The fact sheet should be attractive to the reader, with appropriate white space and major points highlighted. (20 percent of fact sheet grade)
- Clear, logical, appropriate, evidence-based conclusions, analyses, and recommendations (20 percent of fact sheet grade).

CUNY SCHOOL OF PUBLIC HEALTH

Brooklyn College
Health Care Financial Management (HNSC 7143, 3 credits)

Spring 2016

Course Description	Study of the basic principles of health-care finance and accounting. Analysis of health-care financial statements and accounting techniques. Evaluation of managing working capital, budgeting, using cost information in decision making, controlling costs, and financing capital projects in the health-care setting. Analysis of approaches to pricing, rate setting and cost control in the health-care reimbursement environment.
Course meets	4145 Ingersoll, Thursdays 6:30-9:00
Instructor	Robert A. Padgug PhD
Email	RPadgug@brooklyn.cuny.edu (easiest way to reach me)
Phone	917-484-0744
Office	4145 Ingersoll
Office hours	5:00-6:20 Mondays and Thursdays (no appointment necessary, but best to email or phone to alert me that you are coming)
Required books	Michael Nowicki, *Introduction to the Financial Management of Healthcare Organizations* (6th edition, Chicago: American Health Administration Press, 2015; ISBN: 978-1-56793-699–8)
Recommended books	Supplemental readings appear on Blackboard within each session section ("Course Documents")
Other Required Material	Supplemental readings appear on Blackboard within each session section ("Course Documents")

Assessment
Your understanding of the course material will be evaluated through midterm and final exams, term paper, class participation,

Grading Policies

Midterm	30%
Final exam	30%
Term Paper	30%
Class Participation	10%
	100%

Attendance and class participation: Attendance is mandatory. Non-attendance will result in reduced credit. If you cannot attend a class, please let the instructor know in advance so that you do not lose credit.

Class citizenship & rules of conduct

Cellphones: turn cellphones off

Others: you may use laptops or recording devices

CLASS SCHEDULE

Session	Date	Topic	Assignment
1-2	Feb. 4-11	Introduction/Overview	Nowicki 1-2
3	February 18	Organization Structures/Tax Status	Nowicki ch. 3
4	February 25	Operating Revenue (1) (3rd-party Payment)	Nowicki ch. 4 (paper topic distributed in class)
5	March 3	Operating Revenue (2) (Medicare/Medicaid)	Nowicki ch. 5
6	March 10	Cost Accounting	Nowicki ch. 6
7-8	March 17-24	Reimbursement	Nowicki ch. 7 (initial paper outline due March 17)
9	March 31	In-Class Mid-Term	Includes Nowicki chs. 1-7 and Black board materials
10	April 7	Working Capital, Revenue Cycle	Nowicki chs. 8-9
11	April 14	Planning	Nowicki ch. 11
12	April 21	Budgeting	Nowicki chs. 12-13
	April 28	No Class (spring break)	
13-14	May 5-12	Financial Analysis	Nowicki ch. 14
	May 19	No Class (reading day)	
15	May 26 (6:00-8:00)	In-Class Final exam	Includes Nowicki chs. 8, 9, 11, 12, 13, 14; course paper due

COURSE COMPETENCIES

Competencies	Course Learning Objectives	Sessions & Assessments
Listed below are the competencies . This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed as part of the following course sessions and assessments:
1. Demonstrate knowledge of political, economic and social context of health policies	• understand the various contexts of financial management • understand the role of public and private reimbursement policies in the financial management of hospitals and	Sessions 1, 2, 3, 4, 5 (with slides and readings); will be tested on mid-term and through term paper

Competencies	Course Learning Objectives	Sessions & Assessments
	other health institutions	
2. Examine, analyze and explain the intended and unintended consequence of national policies and reforms	• comprehend how the federal ACA and the NYS DSRIP programs affect health care institutional financing	Sessions 4, 5 (with slides and readings); will be tested on mid-term and through term paper
3. Discuss the policy process of improving the health status of population	• understand the responsibilities of hospitals in improving the health of their catchment area populations	Sessions 1, 2 (with slides and readings); will be tested on mid-term and through term paper
4. Discuss the legal and ethical bases for public health and health services	• understand the ethical basis of financial management	Session 2 (with slides and readings); will be tested on mid-term and through term paper
5. Demonstrate leadership skills for building partnerships	• understand why partnerships with community-based organizations and other institutions are necessary and how they can be created for improved financial results	Session 3, 4, 5, 11 (with slides and readings); will be tested on mid-term and through term paper
6. Apply principles of program planning, development, budgeting, management and evaluation in organizational and community initiatives	• be able to create a healthcare organization financial plan, budgets, evaluation methods	Sessions 1-11. 12. 13. 14 (with slides and readings); will be tested on mid-term and final and through term paper
7. Explain methods of ensuring community health safety and preparedness	• understand how hospitals and other institutions finance community health safety and preparedness methodologies	Sessions 1-8, 11 (with slides and readings); will be tested on mid-term and final and through term paper
8. Apply systems thinking for resolving organizational problems	• understand financial planning, budgeting, and financial analysis	All sessions, especially 11-14 (with slides and readings); will be tested on mid-term and especially final and through term paper

Additional Objectives Specific to HNSC 7143:

1. Analyze and explain the role of financial management in health care. (sessions 1-2)
2. Understand health care systems and the health care environment in which managers operate. (sessions 1, 2, 3, 4, 5)
3. Understand the role of financing in health care organizations. (all sessions, in particular 1, 2)
4. Learn the legal environment that constrains health care structure and finance. (session 2)
5. Understand public policy as it affects health care financing. (sessions 1-5)
6. Work with varied approaches to pricing, rate-setting and cost control (sessions 4-5)
7. Analyze and articulate health care inpatient, outpatient, and managed care reimbursement strategies and investment strategies (session 3-5)
8. Comprehend financial reporting and financial ratios (sessions 13-14)
9. Understand corporate budgeting (session 12)
10. Understand financial planning (session 11)

Institutional policies

Accessibility – Center for Student Disability Services

In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with Valerie Stewart-Lovell, Director of the Center for Student Disability Services, at 718-951-5538. If a student is already registered with the Center for Student Disability Services, the student should provide the professor with the course accommodation form and discuss the specific accommodation with the professor.

IMPORTANT: For more information on college-wide regulations governing grading, attendance, grade appeals, and other important matters, please see the "Academic Regulations and Procedures" section of the Brooklyn College Graduate Bulletin.

Academic integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: http://www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation. **I WILL report ALL instances of cheating, plagiarizing, or any other type of academic dishonesty.** (See form at end of syllabus)

Help with research and writing

The Library maintains a collection of links to sites that can assist you with proper citation format and paraphrasing and quoting other authors at http://library.brooklyn.cuny.edu Research & Writing Help. The Learning Center has writing tutors available to help you with your writing: http://lc.brooklyn.cuny.edu

Grade of incomplete: can be given when appropriate; it is the student's responsibility to complete all class work by the date specified by the college (see college calendar for Fall 2016)

Appendix C: Brooklyn College Faculty Action Report for Incidents of Academic Dishonesty



Print Form

BROOKLYN COLLEGE

Faculty Action Report Form for Incidents of Academic Dishonesty

If a faculty member, upon investigation, confirms that a suspected violation of the CUNY Policy on Academic Integrity has occurred and/or if the student admits to the violation, the faculty member **must** report the violation by completing and submitting a FAR Form.

The form should be forwarded to the appropriate Academic Integrity Official. For a violation in an undergraduate course send the form to Mr. Patrick Kavanagh (3208 Boylan Hall); for a violation in a graduate course send the form to Professor Philip Gallagher (3227 Boylan Hall).

A. Information about the Incident

Student Name: _____ Student ID#: _____

Date of Incident: ____ / ____ / ____ Type of Incident: ☐ Cheating ☐ Plagiarism ☐ Other

Description of Incident (please be specific): _____

_____

_____

Indicate the outcome of your discussion of the violation with the student: _____

_____

_____

Course Title: _____ Course Number: _____ Section: _____

Instructor Name: _____ Dept: _____

Phone: _____ E-mail: _____

B. Academic (Grade) Sanction

What academic sanction are you imposing?

☐ Failing Grade on Exam/Assignment ☐ Failing Grade for Course

☐ Other (please explain): _____

Did the student accept this sanction: ☐ Yes ☐ No, please explain: _____

_____

C. Disciplinary Complaint Option

Are you filing a disciplinary complaint with the Office of the Dean of Student Affairs for investigation and possible disciplinary charges?

☐ No

☐ Yes - Please be sure to enter a PEN grade for the course and to forward the *Disciplinary Complaint Form* and all supporting documentation to the Office of Student Affairs.

Instructor Signature _____ Date: ____ / ____ / ____

* Copies of all disciplinary forms are available for print-out at http://www.brooklyn.cuny.edu/bc/offices/studlife/ (under the category "Get It Right").

Revised 9/2007

GENERAL PUBLIC HEALTH SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

Brooklyn College

Health Services Development and Implementation in Community and Public Health

HNSC 7164 (3 credits)

Spring 2016

Catalogue description (modified)	Planning, developing and implementing public health and personal health services are vital to population health. Planning for health services is conducted from the global to the community level. This course examines health service planning in the United States and especially New York State and City. The course will also examine the way in which corporations and community-based organizations carry out strategic planning in order to better be able to design public health programs. The public policy environment will be used as an important part of the context in which program development takes place.
Course meets	Ingersoll 3424, 6:30-9:00 PM
Instructor	Robert A. Padgug PhD
Email	RPadgug@brooklyn.cuny.edu (best way to reach me)
Phone	917-484-0744
Office	Ingersoll 4111
Office hours	Monday, Thursday 5:00-6:20 (no appointment needed, but it helps if you email, text, or phone that you are coming, if possible)
Required books	Bonnie C. Hodges with Donna M.Videto, *Assessment and Planning in Health Programs* (Sudbury, MA: Jones & Bartlett 2011; ISBN 9780763790097). Other required reading will be found in the session listing section, below
Recommended articles	Recommended articles will be found for each class session in Blackboard "Course Documents" section

Assessment

Your understanding of the course material will be evaluated through assignments, exams, term project, and class participation

Grading

%	Assignments	10%
%	Midterm	25%
%	Term project/paper	30%
%	Class participation	10%
%	Final exam	25%

100%

Attendance Policy. Attendance is mandatory. Non-attendance will result in reduced credit. If you cannot attend a class, please let the instructor know in advance so that you do not lose credit.

***University's Policy on Academic Integrity*.** The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: http://www.brooklyn.cuny.edu/bc/policies .

***Center for Student Disability Services*.** In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with Valerie Stewart-Lovell, Director of the Center for Student Disability Services, at 718/951-5538. If a student is already registered with the Center for Student Disability Services, the student should provide the professor with the course accommodation form and discuss the specific accommodation with the professor.

Schedule (suggested format)

Readings and Assignments

Session	Date	Topic	Readings and Assignments (see session assignments in Blackboard Course Documents section for additional)
1	February 1	Introduction/Overview	Hodges 1; slides 1 Introduction; readings in session 1 (Blackboard Course Document section)
2	February 8	Needs Assessment	Hodges 2-3; slides 2-3 Needs Assessment; readings in session 2-3 (Blackboard Course Document section)
	February 15	No class (Presidents Day)	
3	February 22	Needs Assessment	Hodges 2-3; slides 2-3 Needs Assessment; readings in sessions 2-3 (Blackboard Course Document section)
4	February 29	Planning Process/Evidence-Based Programs	Hodges 4-5; slides 4-5 Program Planning ; readings in session 4 (Blackboard Course Document section); Term Paper Assignment (Introduction - see Blackboard "Assignments" section)
5	March 7	Theories in Planning/Program Logic Model	Hodges 7; slides 6 Logic Model; readings in session 5 (Blackboard Course Document section)
6	March 14	Mission Statements, Goals, Objectives, Quality	Hodges 7; slides 7 Quality Program; readings in session 6 (Blackboard Course Document section); Term Paper topic overview due (see Term Paper Assignment in Blackboard "Assignments"
7	March 21-28	Program Implementation	Hodges 9; readings in session 7 (Blackboard Course Document section)
8	April 4	Program Evaluation (Introduction)	Hodges 10; readings in session 8 (Blackboard Course Document section)
9	April 11	Midterm	Hodges 1-10 with related materials for each session

10	April 18	Strategic Planning (1)	Materials on Blackboard session 10; optional readings for sessions 10-12 in Appendix section of Blackboard Course Documents
	April 25	No class (spring break)	
11	May 2-9	Strategic Planning (2)	Materials on Blackboard session 11; optional readings for sessions 10-12 in Appendix section of Blackboard Course Documents
12	May 16	Strategic Planning (3)	Materials on Blackboard session 12; optional readings for sessions 10-12 in Appendix section of Blackboard Course Documents
15	May 23	Final Exam	Sessions 10-14 materials

General Public Health Specialization Competencies	**Course Learning Objectives**	**Sessions**
This course will help you achieve increased competency in general public health. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed as part of the following course sessions and assignments:
Apply approaches for improving the health status of populations, including a specific initiative for a target population	• Plan & implement programs to improve the health status of specific populations • Assess available resources for health promotion and disease prevention capabilities within health service organizations in urban communities.	Sessions 1, 2, 3, 4, 5; assessment through class exercises (list in sessions on Blackboard); mid-term, final, and term paper on community program development and implementation
Apply principles of planning, development and practice of organizational and community initiatives that relate to program planning, policy formulation or research	• Identify organizations that can play a role in health promotion and disease prevention within urban communities • Plan & Implement organizational and community initiatives relating to program planning, policy formulation, policy research. • Assess opportunities and challenges of applying a systems approach to addressing health services planning and development. • Identify and include strategies to reduce	Sessions 4, 5, 6, 7; assessment through class discussion and exercises (listed in session assignments) and through term paper on community program development and implementation (esp. sections on

	disparities in health. • Describe a collaborative process for prioritizing individual, organizational, and community concerns, and for bringing resources to bear on health programs.	needs assessment and identification of community partners)
Use audience-appropriate written and oral communication to convey public information	• Be able to create appropriate literature for community health programs for the general community as well as for funders • Be able to explain orally proposed programs to colleagues, community partners, and the community	All sessions; in-class presentation of paper topics and proposed programs; written description of proposed programs
Develop collaboratively public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served	• Understand culturally-appropriate public health planning and utilize it in program planning and implementation	Sessions 4, 5, 6, 7; assessment through class discussion and exercises (listed in session assignments) and through term paper on community program development and implementation (esp. sections on needs assessment, community assessment and description, and identification of community partners)
Differentiate among evaluation methods in relation to their strengths, limitations and appropriate uses	• Be prepared to evaluate specific programs for population-based health improvement	Session 8; assessment through class discussion and exercises (listed in session assignments) and through term paper on community program development and implementation (esp. sections on appropriate social and public health theories)
Analyze the effects of political, social and economic policies on public health systems at the local, state, national and international levels.	• Understand the nature and specific content of political, social, economic policies at all governmental levels and plan programs within the parameters of such policies; • Analyze national, state, and local governmental policies and interdependencies on health services related	Sessions 10, 11, 12; assessment through class discussion and exercises (listed in session assignments) and through term paper on community

	problems.	program development and implementation (esp. sections on needs assessment and environmental assessment)

CUNY SCHOOL OF PUBLIC HEALTH

Brooklyn College

HNSC7171 Program Evaluation for Community Health

Catalogue description	Development and application of program evaluation methods applicable in a range of community health and public health settings. Critique of existing community health education and other health programs for promoting critical thinking and analytic skills.
Pre-Req	HNSC 7170X or 7110X
Course meets	
Instructor	Professor Betsy Eastwood, PhD
Email	**eastwood@brooklyn.cuny.edu** Please email me!
Phone	718-951-5000 X2755
Office	Ingersoll 5129
Office hours	Tu 3-6 pm and by appointment. Please email me first.
Required books	Issel, Michele. *Health Program Planning and Evaluation: A Practical, Systematic Approach for Community Health, 2nd Edition.* Sudbury, MA: Jones and Bartlett, 2009.
Recommended books	See below
Other required materials	All other material are on Blackboard

Assessment

Your understanding of the course material will be evaluated through oral presentations using PowerPoint, written assignments, and a project developed over the semester and reported on at the end of the term.

Grading

40%	Assignments
30 %	Term project paper
20%	Class presentation
10 %	Class participation
100%	

Attendance and class participation

Lateness and absences

Late submission of assignments
Class citizenship & rules of conduct
    Cellphones
    Others
Email correspondence
Other policies you may have

Institutional policies (provide website link)
Academic integrity
The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both.
Cheating on weekly quizzes or exams, for example by using notes or text, or by completing a test with assistance, constitutes an act of academic dishonesty. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing that policy can be found at this site: http://www.brooklyn.cuny.edu/bc/policies/

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Help with research and writing

Last day to drop the course with the grade of "W"
Grade of incomplete: I do not give incompletes. Assignments are due on the date of each assignment
Grade appeals: HNSC Academic Standing Committee through the chair of HNSC

Schedule

Session 1 Introduction to Course

Institute of Medicine: U.S. Health in International Perspective: Shorter Lives, Poorer Heath, January, 2013. Available on Blackboard. Read the summary document and the chapter entitled Summary that is contained in the full report.

Session 2 An Overview of Program Evaluation

Issel, Chapters 1 and 2, Context of Health Program Development and Evaluation

Session 3 The Planning Process

Related course learning objectives:
o Identify strategies and activities to help mobilize community support for health programs
Required reading:
Issel, Chapter 3, Planning for Health Programs and Services
75-105.
Applications:
WK Kellogg Foundation. Sustaining Community-based Initiatives. Module One: Developing Community Capacity. Chapter 3, Building the Coalition.

Session 4 Models for Program Planning

Related course learning objectives:
o Identify strategies and activities to help mobilize community support for health programs

Required:
Issel, Chapter 4, Community Health Assessment for Program Planning

Application:
Hanni K, Garcia E, Ellemberg C, Winkelby M. Targeting the taqueria: Implementing healthy food options at Mexican American restaurants. Health Promotion Practice 2009;10(2) Suppl.: 91S-99S.

Recommended:
The Precede-Proceed Planning Model. See The Community Toolbox at http://ctb.ku.edu/en/tablecontents/sub_section_main_1008.aspx

WK Kellogg Foundation. Sustaining Community-based Initiatives. Module Three: Community and Economic Development Chapter 4. Identifying Service Venture Opportunities.

Session 5 Conducting A Community Assessment

Related course learning objectives:

o Identify community assets that can be used to address community health issues

Principles & Methods:
Issel, Chapter 6, Program Theory and Interventions Revealed

Francisco V & Butterfoss F. How do we know if we are making a difference with our program or community initiative? Health Promotion Practice 2003;4:367-370

Nation M, Crusto C, Wandersman A et al. What works in prevention. American Psychologist 2003; 58(6/7):449-456.

Application:
Polacek G, Coker J, Lewis K et al. BART to HIVEd: Adapting an HIV education prevention program. Health Promotion Practice 2008;9(1):45-58.

Session 6 Developing Evidence-Based Programs

Related course learning objectives:
o Select an appropriate intervention strategy for a community health program

Required reading:

Rossi et al., Chapter 5, Expressing and Assessing Program Theory
Centers for Disease Control and Prevention. Community Health Resources.
http://apps.nccd.cdc.gov/dach_chaps/Default/index.aspx

Session 7 Community Assessment Presentations

Related course learning objectives:
o Apply elements of a community health assessment using health and social statistics and information from community observations
o Compile and present findings from a community health assessment

Session 8 Developing Quality Programs

Related course learning objectives:
o Select an appropriate intervention strategy for a community health program

Required reading:
Issel, Chapter 7, Program Objectives and Setting Targets
Wandersman A, Morrissey E, Davino K, et al. Comprehensive quality programming and accountability: Eight essential strategies for implementing successful prevention programs. The Journal of Primary Prevention 1998; 19:3-30.

Application:
Johnston Y, Denniston R, Morgan M, Bordeau M. Rock on café: Achieving sustainable systems changes in school lunch programs. Health Promotion Practice 2009; 10(2) Suppl.: 100S-108S.

Session 9 Developing a Program Logic Model and Program Plan

Related course learning objectives:
o Formulate a program logic model and related program objectives for a community health program
o Develop a program plan and budget for a community health program
Required reading:

W.K. Kellogg Foundation Logic Model Development Guide.

Applications:
Dilley J, Reuer J, Colman V, Norman RK. From making pamphlets to making policies: Results from a collaborative training to increase knowledge, motivation, and self-efficacy for achieving public health policy and systems change. Health Promotion Practice 2009; 10 (2) Suppl.:138S-145S.
Goldman K., Schmalz K. Facilitated fussbudgeting : how to plan and revise budgets. Health Promotion Practice 2003; 3:210-213.

Recommended:

Session 10 Evaluation for Program Quality Improvement

Related course learning objectives:
o Identify the main elements and applications of program monitoring and process evaluation

Required reading:
Issel, Chapter 9, Process Evaluation - Measuring Inputs and Outputs
Rossi et al., Chapter 6, Assessing and Monitoring Program Process.

Applications:
Saunders R, Evans M, Joshi P. Developing a process evaluation plan for assessing health promotion program implementation: a how-to guide. Health Promotion Practice 2005;6: 134-147.

Session 11 Evaluating Program Effects

Related course learning objectives:
o Describe major designs for outcome evaluation and their respective strengths and

weaknesses regarding the ability to draw conclusions about program effects

Required reading:
Issel, Chapter 11, Planning Intervention Effects Evaluation
Issel, Chapter 12, Choosing Designs for Effect Evaluation

Session 12 Monitoring Program Outcomes; Developing an Evaluation Plan

Related course learning objectives:
o Identify the main elements and applications of program monitoring and process evaluation
o Select an appropriate evaluation strategy
o Develop an evaluation plan and budget

Required reading:
Rossi et al., Chapter 7, Measuring and Monitoring Program Outcomes
Applications:
Linnan L, Ferguson, Y, Wasilewski Y, et al. Using community-based participatory research methods to reach women with health messages: results from the North Carolina BEAUTY and health pilot project. Health Promotion Practice 2005;6:164-173.
McDonald E., Gielen A., Trifiletti L. et al. Evaluation activities to strengthen an injury prevention resource center for urban families. Health Promotion Practice 2003; 4:129-137.

Session 13 Data Collection for Program Evaluation; Qualitative Methods

Related course learning objectives:
o Identify methods for collecting quality community health data
Required reading:
Issel, Chapter 13 Sampling Designs and Data Sources for Effect Evaluation
Issel, Chapter 15 Qualitative Methods for Planning and Evaluation

Application:
Brown K, Lindenberger J, Bryant C. Using pretesting to ensure your messages and materials are on strategy. Health Promotion Practice 2008; 9(2):116-122.

Session 14 Ethics of Program Evaluation; Strengthening the Planning-Evaluation Cycle

Related course learning objectives:
o Identify evaluation situations requiring IRB review
o Describe elements required for participant/client informed consent process
o Describe how HIPAA requirements apply to program evaluations

Required reading:
Rossi et al., Chapter 12, The Social Context of Evaluation.
Joly B. Writing community-centered evaluation reports. Health Promotion Practice 2003;

4:93-97.
Windsor R, Clark N, Boyd N, Goodman R. Evaluation of Health Promotion, Health Education, and Disease Prevention Programs. 3rd Ed. New York: McGraw Hill; 2003. Appendix A: The Evaluation Report.

WK Kellogg Foundation. Sustaining Community-based Initiatives. Module Three: Community and Economic Development. Chapter 1, Shifting Our Outlook.

Application:
Jilcott S, Laraia B, Evenson K, et al. A guide for developing intervention tools addressing environmental factors to improve diet and physical activity. Health Promotion Practice 2007; 8(2):192-204.

Session 15 <u>Student Presentations</u>

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you achieve increased competency in health care policy and administration. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed through the following methods
Apply approaches for improving the health status of populations, including a specific initiative for a target population	• Identify strategies and activities to help mobilize community support for health programs • Identify community assets that can be used to address community health issues • Select and use public access databases to assess community needs • Select an appropriate intervention strategy for a community health program • Formulate program logic model and related program objectives for a community health program a program plan and budget for a community health program	Assignment1 – determining a population health problem and method to address problem
Apply principles of planning, development and practice of organizational and community initiatives that relate to program planning, policy formulation or research	• Identify methods for collecting quality community health data • Apply elements of a community health assessment using health and social statistics and information from community observations • Develop an evaluation plan and budget • Develop a program plan and budget for a community health program • Describe elements required for participant/client informed consent process	Assignment 2 and 3 – Review of pertinent literature and development of logic model
Use audience-appropriate written and oral communication to convey public health information	• Compile and present findings from a community health assessment • Develop a written proposal for an evidence- based community health program	Assignment 4 –class presentation of program design, implementation, and evaluation methods

Develop collaboratively public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served		Assignment 4 –class presentation of program design, implementation, and evaluation methods
Differentiate among evaluation methods in relation to their strengths, limitations and appropriate uses	• Describe major designs for outcome evaluation and their respective strengths and weaknesses regarding the ability to draw conclusions about program effects • Identify the main elements and applications of program monitoring and process evaluation • Identify evaluation situations requiring IRB review • Select and appropriate evaluation strategy • Describe how HIPAA requirements apply to program evaluations	Assignment 3 – logic model including evaluation techniques
Analyze the effects of political, social and economic policies on public health systems at the local, state, national and international levels		Assignment 2 – literature review and review of local data resources and key stakeholders

COURSES TAUGHT TO MPH STUDENTS AT BROOKLYN COLLEGE

CUNY SCHOOL OF PUBLIC HEALTH

Campus – Brooklyn College
Course Number HNSC 7920X – Supervised Fieldwork in Public Health
ER6
Spring Semester 2016

Course meets	Thursdays - 6:30-9:00pm - 4141N (Ingersoll Hall)
Instructor	Sean J. Haley Ph.D., MPH
Email	SJHaley@brooklyn.cuny.edu
Phone	Messages at 718-951-5000 x5766
Office	Ingersoll 4430
Office hours	Wednesday 3:30-5:50, Thursday 5:30-6:30
Required books	None
Recommended books	None
Reserve material	NA
Other required materials	Posted on Blackboard (Articles posted to Blackboard are listed below following the class schedule)
Catalogue description	Students carry out 180 hours of supervised field work that is intended to bridge academic preparation and public health practice. Knowledge and skills from the core MPH and specialization courses are applied in a public health agency, community organization or other setting relevant to the student's academic background, specialization and career expectations. This is accomplished under the supervision and guidance of an experienced preceptor. Field-based hours are implemented with classroom and individual meetings along with online communication. Aside from deliverables required by the preceptor, the student develops a reflection paper, a self-evaluation and a capstone proposal. Supervised individual projects in community program or health agency. Weekly seminars, except when noted below. Note: Internship Manual for Spring 2016 is an official part of this syllabus.
Pre-Reqs	Completion of at least 18 MPH credits, which includes biostatistics, epidemiology, and two courses in the student's area of specialization.

Assessment
Students understanding of the course material will be evaluated through papers submitted, class participation, and evaluation by internship site supervisors. This course requires the fulfillment of the hours specified by the student's degree at the year of your matriculation (between 90-180 hours).

Course policies

Grading
Students grade in this class is based on evaluations by both the field supervisor and the course instructor.

Course writing assignments are described in separate handouts. Grades will be determined as follows:

A+	96 - 100	C	73 – 77
A	93 – 96	C -	70 – 72
A-	90 – 92	D+	68 – 69
B+	88 – 89	D	63 – 67
B	83 – 87	D-	60 – 62
B-	80 – 82	F	59 or below
C+	78 – 79		

1. Supervisor's evaluation 30%
2. Attendance/participation 10%
3. Summary Paper 30%
4. Supporting documents 20%
   (Abstract, learning objectives, Gantt, Logic Model, CITI, Timesheets, doc)
5. Poster/Oral presentation 10%

Internship:

The internship grade will based on the quality of the contract elements that are submitted, field supervisor comments, assessment of the quality of your service and difficulty of the placement (midpoint and final reviews). **Students should have secured an internship before the first class. Failure to do so may compromise the delivery of timely products and course standing.** All items are to be submitted electronically.

Contract elements include:

- Student information form (available electronically on Blackboard)
- Supervisor information form (available electronically on Blackboard)
- Signed student/supervisor agreement form (last page of the manual)
- *Approved abstract***Note-Professor will review one draft. The next iteration will be graded.
- *Approved learning objectives***
- *Approved logic model*** (see: http://www.wkkf.org/knowledge-center/resources/2006/02/WK-Kellogg-Foundation-Logic-Model-Development-Guide.aspx) (sample format available on Blackboard)
- *Approved Gantt chart*** (sample format available on Blackboard)
- *Human Subjects Basic Course*** – Complete the Human Subjects Basic Course at the Collaborative Institutional Training Initiative (CITI) online site: https://www.citiprogram.org/ In creating your individual user login account when asked for the institution indicate CUNY, then follow the prompts to set up your account. After establishing your account you will be able to complete the online course for free. PDF certificate confirming completion is required.
- *Students' self assessment at midpoint***
- *Time sheets*** Completed timesheets (Blank forms Available on Blackboard) - Copies scanned to one PDF document with signatures are to be submitted electronically to Blackboard.

**Contract elements not due within first three weeks.

Midpoint review. Described in detail in the Manual.

- Student mid-point self evaluation, signed by supervisor. (Available on Blackboard).

Final Evaluation. Described in detail in the Manual.

- To be submitted electronically Blackboard.
- Field supervisor final evaluation of student (The form will be emailed to the site supervisor and returned to Professor Stackhouse) Note, failure of the supervisor to return the completed evaluation before grades are due may delay of grade submission.

Guidelines for all materials to be submitted in fulfillment of course requirements noted above.

- All materials are to be submitted via Blackboard.
- In addition to the detailed instructions for materials found in the Fieldwork Handbook the

following standards apply:

- As noted in the Handbook, any time a reference is made the APA reference format is required.
- **All materials submitted** should have a document name using the following naming convention to upload (This holds for all types of saved electronic documents – MSWord, Excel, PDF, or any other):
    - Last name. First initial. document name (not yours-the name of the assignment e.g. "abstract" .MM.DD.YR Example: Smith.M.Abstact 1.09.15.14

Attendance:
Attendance is mandatory and absences will result in reduced credit unless excused before the class by email; please arrive on time and make sure that all cell phones are silenced.

Summary document/evaluation:
The summary is a10 page detailed review that critically describes your internship responsibilities, reflects on major course discussion areas. The summary should be more than a description of what you did, it should contain insights about unexpected learnings what you might have done differently. **To be clear, admitting that an internship was not perfect is not a weakness.** Indeed, identifying potential areas for improvement (either your own or the organization's) is at the core of what the internship is meant to deliver. If you have produced a report, document or other final product(s), it **MUST** be attached as an appendix. The summary should include itemized references to your learning objectives and clearly identify progress made and challenges faced for each objective. See grading rubric.

Posters:
Posters & their presentation represent a public display of your internship. Instructions appear in the Manual. Samples of posters from previous classes can be found posted in the hallway outside the Departmental Office. Note: this must be a professional poster. Posters not meeting professional expectations will not be graded.

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Disability: In order to receive disability-related academic accommodations, students must first be registered with the Center for Student Disability Services (CSDS). Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with Valerie Stewart-Lovell, Director CSDS, at 718-951-5538. If a student is already registered with CSDS, the student should provide the professor with the course accommodation form and discuss the specific accommodation with the professor. Per College policy, students are not permitted to bypass CSDS and go directly to a faculty member to request accommodation. Faculty members are not permitted to grant an accommodation without receiving the *Verification of Disability and Course Accommodations* forms from CSDS. Please note that, in addition to chronic conditions, many students who are dealing with acute or short-term health issues may be eligible for accommodation

Non-Attendance Because of Religion Beliefs: see p. 53 of the BC Bulletin. Please let Professor Haley know about such absences before the class(es) to be missed so that he can make arrangements for you to make up the missed material.

Schedule

Class	Date	Topic	Due
1.	February 4	Introduction to Class & Ethics	*Draft abstract due in class*
2.	February 11	Public Health Core Functions	*Draft abstract due (BB)* *Internship profile due (BB)* *Supervisor profile due (BB)*
3.	February 18	Public Health Infrastructure and Delivery	
4.	February 25	Logic Models and Gantt Charts	
5.	March 3	Complete CITI	*CITI due (BB)* *Draft LOs due (BB)*
6.	March 10	Making Presentations	*Draft Logic Model (class)* *Draft Gantt Chart (class)*
7.	March 17	Fieldwork Progress	*Draft Logic Model (BB)* *Draft Gantt Chart (BB)*
8.	March 24	Leadership & Management	*Mdpt Eval (BB)*
9.	March 30	Challenges and Opportunities: Internship at the Midpoint	
10.	April 7	No Class to be held - Individual telephone calls will be scheduled once Dr. Haley has received your signed midpoint evaluation and spoken with your supervisor.	
11.	April 14	No Class to be held - Individual telephone calls will be scheduled once Dr. Haley has received your signed midpoint evaluation and spoken with your supervisor.	
April 22-30		**Spring Break**	
12.	May 5	Resumes and professional development.	*Resume due (class and BB)*
13.	May 12	Presentation of Internships, Posters (session I):	*All final documents due for presenters.(Abstract, Logic model, Gantt)*
14.	May 19	Presentation of Internships, Posters (session II):	*All final documents due for presenters.(Abstract, Logic model, Gantt)*
15.	May 26		*Final Papers due (BB), Timesheets (BB), Intern evaluation (BB), Copy of signed thank you letter*

February 4 Ethics in Public Health

Thomas, J. C., Sage, M., Dillenberg, J., & Guillory, V. J. (2002). A code of ethics for public health. *American Journal of Public Health*, *92*(7), 1057-1059.

Gillon, R. (1990). Ethics in health promotion and prevention of disease. *Journal of medical ethics*, *16*(4), 171.

Stone, D., *Policy Paradox:* The Art of Political Decision Making. 1997, NYC: W.W. Norton & Company. Chapter 2.

February 11 - Public Health Core Functions:

Ford, E. W., Duncan, W. J., & Ginter, P. M. (2005). Health departments' implementation of public health's core functions: an assessment of health impacts. *Public health*, *119*(1), 11-21.

Levi, J., Juliano, C., & Richardson, M. (2007). Financing Public Health: Diminished Funding for Core Needs and State-by-State Variation in Support. *Journal of Public Health Management and Practice*, *13*(2), 97-102.

Rothstein, M.A., *Rethinking the Meaning of Public Health.* Journal of Law, Medicine & Ethics, 2002. **30**(2): p. 144-149.

February 18 - Public Health Infrastructure and Delivery:

Baker Jr, E. L., Potter, M. A., Jones, D. L., Mercer, S. L., Cioffi, J. P., Green, L. W., ... & Fleming, D. W. (2005). THE PUBLIC HEALTH INFRASTRUCTURE AND OUR NATION'S HEALTH 1. *Annu. Rev. Public Health*, *26*, 303-318.

Hyde, J. K., & Shortell, S. M. (2012). The structure and organization of local and state public health agencies in the US: a systematic review. *American journal of preventive medicine*, *42*(5), S29-S41.

Dilley, J. A., Bekemeier, B., & Harris, J. R. (2012). Quality improvement interventions in public health systems: a systematic review. *American journal of preventive medicine*, *42*(5), S58-S71.

February 25 - Logic Models and Gantt Charts

Logic Model:
http://www.wkkf.org/knowledge-center/resources/2006/02/WK-Kellogg-Foundation-Logic-Model-Development-Guide.aspx

Gantt Chart:
https://www.smartsheet.com/blog/where-do-you-find-best-gantt-chart-spreadsheet-templates

March 3 - Complete CITI

Human Subject module:
http://www.cuny.edu/research/compliance/training-education/citi-training.html

March 10 - Making Presentations

Presenting: https://hbr.org/2013/06/how-to-give-a-killer-presentation/

March 24 – Leadership & Management

Heifetz, R. A., & Laurie, D. L. (1997). The work of leadership. *Harvard business review*, *75*, 124-134.

Tulchinsky, T. H., & Varavikova, E. A. (2010). What is the" new public health"?. *Public Health Reviews*, *32*(1), 25.

Sellers, K., Leider, J. P., Harper, E., Castrucci, B. C., Bharthapudi, K., Liss-Levinson, R., ... & Hunter, E. L. (2015). The Public Health Workforce Interests and Needs Survey: The First National Survey of State Health Agency Employees. *Journal of Public Health Management and Practice*, *21*(Suppl 6), S13.

March 31 – Challenges and Opportunities

Fernandez, S., & Rainey, H. G. (2006). Managing successful organizational change in the public sector. *Public administration review*, *66*(2), 168-176.

May 5 – Resumes

Resumes: https://www.nyu.edu/life/resources-and-services/career-development/prepare-for-the-job-search/resumes-and-cover-letters.html

Interviewing: http://www.forbes.com/forbes/welcome/

May 12 & 19- Poster Presentations

Creating:
http://guides.nyu.edu/posters

Constructing:
http://www.posterpresentations.com/html/free_poster_templates.html

Program Competencies	Course Learning Objectives	Sessions
This course will help you achieve increased competency in health care policy and administration. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed as part of the following course sessions:
Apply the public health core functions of assessment, policy development and assurance	Demonstrate (e.g. through the portfolio) the application of assessment, assurance and/or policy development during the fieldwork experience.	* 1,2,3,4,9, & internship placement * Assignments: Learning objectives, Logic model, Gantt chart, summary paper
Apply theories, concepts, models and methods to the design of public health research, policy and practice	Demonstrate (e.g. through the portfolio) the application of one or more core PH values or techniques through the fieldwork experience	*1,2,3,4,7,9 & internship placement * Assignments: Learning objectives, Logic model, Gantt chart, poster, summary paper, poster presentation
Adhere to ethical and social justice principles and standards	• Apply ethnical principles to fieldwork placement, (e.g. human subjects' protection principles to the data collection). • Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards	* 1 and internship placement * Summary paper
Interpret and analyze public health literature and apply evidence-based research	Demonstrate (e.g. through the portfolio) the application of findings from public health literature to the field work experience	*1,2,3,4,7,9 & internship placement * Assignments: Learning objectives, Logic model, Gantt chart, poster, summary paper, poster presentation
Apply basic statistical and informatics techniques	Participate, through the fieldwork experience, in using statistical and informatics techniques to support a public health program or policy in it's provision and effectiveness.	* Internship placement – when required in the internship setting and experience * Assignments: poster presentation and poster
Communicate public health information through oral, written, digital and visual presentation	Prepare written and oral progress and evaluation reports (e.g. the fieldwork project), using appropriate professional formats.	* 6,7, 13, 14 & Class participation and internship placement * Assignments: Learning objectives, Logic model, Gantt chart, abstract, summary paper, poster presentation and poster
Explain how social, behavioral, biomedical and environmental determinants affect population health	Apply the elements of social, behavioral, biomedical and environmental determinants of and inequities in health and disease to aspects of the provision of public health activities in the internship settings and activities.	*1, 2,3,4,7,9 & internship placement * Assignments: Logic Model, poster presentation and poster
Design and evaluate interventions to prevent or control public health problems	Participate, through the fieldwork experience, in developing, carrying or evaluating out a public health program, remediation measure or policy.	* Internship placement – when required in the internship setting and experience * Assignments: Learning objectives, Logic model, Gantt chart, abstract, summary paper, poster presentation and poster
Collect, analyze and interpret public health data	Participate, through the fieldwork experience, in collecting, analyzing and interpreting public health data to support a public health program or policy in it's provision and effectiveness.	* Internship placement – when required in the internship setting and experience * Assignments: poster presentation and poster
Engage and collaborate with diverse groups	Identify different stakeholders and evaluate their roles on the fieldwork project.	* 1,2,3,4,7,9, & internship placement
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	Apply the elements of public health core elements, infrastructure, and delivery to aspects of the provision of public health activities in the internship settings and activities.	* 2,3, & internship placement * Assignments: summary paper
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project	* 1,2,3,4,7,9 & internship placement * Assignments: Learning objectives, Logic model, Gantt chart
Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Describe skills for organizational and community problem solving, decision making, and evaluation of public health issues. • Describe a collaborative process for prioritizing individual, organizational, and community concerns, and for bringing resources to bear on public health programs.	* 2,3,7,9 & internship placement * Assignments: Learning objectives, Logic model, Gantt chart, poster, summary paper, poster presentation and poster

Public Health Advocacy HPM 754 Spring 2016

Instructor: Nicholas Freudenberg, Distinguished Professor of Public Health
Time: Tuesdays, 4:05 – 5:50 pm Room 217
Hunter Silberman Campus 119th Street and Third Avenue
Room: Office Hours: Tuesdays 2 -3:30 pm and by appointment Room 534
Contact: Telephone 212-396-7738 E-mail nfreuden@hunter.cuny.edu
Pre-Reqs: PH 75500, PH 75600. Students can take this course or HPM 75200.

Brief Course Description:
Prepares students to advocate for policies that promote public health, develops skills in planning and implementing advocacy campaigns; assess theories on role of coalitions and advocacy in changing health policy.

Program Competencies	**Course Learning Objectives**	**Assessment Methods**
This course will help you achieve increased competency in health care policy and administration. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed through the following methods
Apply relevant theoretical/conceptual models and leadership principles to developing health policy and administrating health programs	• Identify theories of policy making that inform public health advocacy efforts • Apply these theories to current advocacy efforts	•
Identify and analyze the legal, economic, ethical and health bases and implications of public health policies that affect urban populations	• Analyze opportunities for health advocacy at the individual, community , organizational and policy levels • Identify and provide a rational for specific advocacy actions designed to achieve at least one health policy goal in New York City	•
Apply strategies for advocating for effective public health policies and programs	• Describe the rational for advocacy as a public health intervention strategy • Explain how advocacy fits with other tools of public health • Analyze the role of public health leaders within advocacy and the impact of advocacy on leaders	•
Evaluate public health programs and health policies and apply evaluation results to their improvement	• Analyze the successes and limitations of a specific health advocacy initiative • Plan, implement and evaluate public health advocacy campaigns	•

Identify and discuss the partnership and collaborative skills needed to develop effective public health programs and policies	• Demonstrate advocacy skills used to raise awareness of health and social policy issues • Assist community residents and organizations to change systems that impede health • Lead groups effectively to achieve health goals	•

Course Topics

Feb 2 *Course Introduction and Overview*
Review of syllabus and assignments. Overview of advocacy in public health. Discussion of student advocacy group profiles and advocate profiles

2/9 *Advocacy within the Policymaking Process* Introduction to agenda setting and policy subsystems, analytic frameworks for understanding policy making. How are agendas set? What roles and power do advocates have? From where is power derived? Case Study 1: The Treatment Action Campaign in South Africa

2/16 *The Role of Evidence in Advocacy*
Lecture and discussion, making use of real-world examples of the ways in which evidence is used, misused and ignored in the policy making process, and the role of advocacy in bringing evidence into the policy arena

2/23 *The Structure of Government: Opportunities and Challenges for Advocacy*
Lecture and analysis of opportunities for advocacy in each branch and level of government

3/1 *Advocacy at the Individual and Family Levels*

3/8 *Theories and Models for Understanding Stakeholders, Building Coalitions and Organizing Communities* Lecture and guided discussion of models of mounting campaigns with coalitions, working alongside and outside of government. Case Study: From Fringe to Establishment, AIDS activism in NYC 1983-2005

3/15 *Communication campaigns for advocacy: theory and application*
Using communication campaigns to persuade the public, including working with the media, utilizing advertisements and other avenues to disseminate messages; discussion of shock vs. education, crafting messages.

3/22 *Using the Law for Advocacy.* Case Study: Legal Action Against Childhood Lead poisoning

4/5 *Legislative Advocacy Campaigns*

4/12 *The Special Challenges of Evaluating Advocacy Campaigns*
Lecture reviewing terms and concepts regarding evaluation.

4/19	*Pulling it all together: Planning an advocacy campaign. Steps and Principles* Lecture and guided discussion on turning tools into a campaign; special attention to sequencing of activities, monitoring, stakeholder involvement, political environment, media.
4/26	spring break
5/3	*Pulling it all together Case Studies:* Class discussion applying planning framework from previous sessions week by focusing on several current advocacy efforts Case Study: The Treatment Action Coalition in South Africa
5/10	*Training for advocacy*: Approaches to preparing citizens and professionals to take on advocacy roles; indications for and limits of this approach.
5/17	*Media advocacy.* Use of mass and other forms of media for advocacy, roles of health professionals Student presentations
5/24	Final presentations

Course Assignments

1. Attendance, participation(rated on quantity and quality), short homework assignments and readings. 10 % of final grade
   On first day of class, submit a one profile of an advocate you admire and (separately) an advocacy organization that works on a health issue you care about and come to class prepared to discuss the advocate profile.
2. Lead a 10 minute advocacy skills session, 5% (see schedule below)
3. Written report on interview with policy advocate 20% Due 3/22
4. Two meetings with instructor, one to discuss draft case study the other to discuss career goals related to advocacy
4. Case study paper following outline to be developed in class, 35%
   First draft due 5/3 Final Draft Due 5/17
5. Oral presentation of case study of advocacy campaign 5% (5/24)

6a. Two short written assignments: op ed or legislative testimony (10% each) Due on 3/22 and 4/26 **OR** 6b. A 10-15 page policy advocacy report (20%) (Due 4/26)

For all assignments, students are expected to follow all university guidelines. See last pages of syllabus for a description of these expectations

Assignemnt 1 Due First Day of Class

1 a. Public health advocates

Write a one page single spaced profile of one of the following public health activists/advocates, describe their role, their advocacy accomplishments, the challenges they face and 3 questions you would want to ask them if you were to meet.

Advocate	**Reference**—This is to get you started—please find others to fill out your profile	**Link**
Zachie Achmat, a co-founder and activist in South Africa's Treatment Action Coalition, an AIDS group	Powers S. (2003) .The AIDS Rebel: Letter from South Africa. The New Yorker 79:12, pp54-64	http://honors490-2014-penner.wikispaces.umb.edu/file/view/Power,+theAidsRebel.NewYorker.20035.19-1.pdf
Rogelio Riojas Director of Sea Mar, a	Rogelio Riojas: "I'll be an activist until I die."	http://sph.washington.edu/alumni/profile.asp?content_ID=2089 and

clinic for Latino populations in Seattle Washington		video http://depts.washington.edu/civilr/riojas.htm
Margaret Sanger, birth control advocate an founder of Planned Parenthood	The Leadership of Margaret Sanger: A Values-Based Analysis. Laurin Roberts, ULR Issue III Volume II	http://cnu.edu/leadershipreview/archives/v3i2%20roberts.pdf
Alice Hamilton, occupational health physician and activist	Alice-Hamilton Exploring the Dangerous Trades by Janet Golden for Women's Voices of Change	http://womensvoicesforchange.org/alice-hamilton-exploring-the-dangerous-trades.htm
US activists who created early AIDS activism	Wright J. Only your calamity: the beginnings of activism by and for people with AIDS. Am J Public Health. 2013;103(10): 1788-98.	http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.2013.301381
WEB Du Bois, Founder of National Association for the Advancement of Colored People (NAACP) in 1909 and leading Black	Brown TM, Fee E. William Edward Burghardt DuBois: historian, social critic, activist. Am J Public Health. 2003 Feb;93(2):274-5.	http://ajph.aphapublications.org/doi/full/10.2105/AJPH.93.2.274
Bill McKibbon, environmental activist and opponent of Keystone Pipeline	Jacobsen R. Boilover Outside Magazine, October 2012	http://www.outsideonline.com/outdoor-adventure/natural-intelligence/Boilover.html
Malik Yakini , Executive Director of Detroit's Black Community Food Security Network	Wallace H. Malik Yakini of Detroit's Black Community Food Security Network, Civil Eats, 2010	http://civileats.com/2011/12/19/tft-interview-malik-yakini-of-detroits-black-community-food-security-network/#sthash.bvQyThnr.dpuf
Dr. Helen Rodriquez, Latina health advocate, pediatrician, feminist, South Bronx activist		https://www.nlm.nih.gov/changingthefaceofmedicine/physicians/biography_273.html
Linda Rae Murrey	Currie DY. The Socially Just Face of Public Health Leadership Linda Rae Murray American Journal of Public Health: 2011,101, 2, 209-211	

1b Public health advocacy organizations

Write a one page single spaced profile of this organization giving its mission, describing its advocacy work related to health and their accomplishments, explaining what you find appealing about the group and listing 3 questions you hope to be able to answer about this group and its role in advocacy by the end of the semester. Start by looking at the organization's web site, then find at least 3 other references that will help you fill out the profile.

ACT UP
Black Lives Matter
Citizens Committee for Children
Doctors Without Borders/Médecins Sans Frontières
Families for Safe Streets NYC
New York Immigration Coalition
New Yorkers Against Gun Violence
Planned Parenthood New York City
Physicians for Reproductive Health
WEACT (West Harlem Environmental Action Coalition

2. Student led skills sessions. By 2/9 , each student will sign up for one of the topics and dates below to present for 5-6 minutes, then answer questions and distribute a one page handout with tips and resources on one of the following topics:

SCHEDULE FOR SKILLS SESSIONS		
Date/Session	Topic	Presenters(Sign up in Class on 2/2 or 2/9)
2/23 The Structure of Government: Opportunities and Challenges for Advocacy	SkillSession 1: Writing a position paper on a policy issue for your agency	
3/8 Theories and Models for Community-Level Advocacy	SkillSession 2: Writing a press release for an advocacy event	
3/15 The benefits and perils of community coalitions for advocacy	SkillSession 3: Writing a letter to the editor	
3/22 Using the Law for Advocacy.	SkillSession 4: Mastering IRS and state rules on non-profit lobbying	
3/29 Legislative Advocacy Campaigns	SkillSession 5: Meeting with an elected official	
4/12 The Special Challenges of Evaluating Advocacy Campaigns	SkillSession 6: Preparing a social media advocacy campaign	

Suggested Resources for Preparing Skills Session Presentations

American Public Health Association. Media Advocacy Manual. Washington, D.C.: APHA at www.apha.org/about/news/mediaadvocacy.htm an Advocacy Tips http://www.apha.org/advocacy/tips/

Community Tool Box http://ctb.ku.edu/en/default.aspx The Community Tool Box is a global resource for free information on essential skills for building healthy communities. It offers more than 7,000 pages of practical guidance in creating change and improvement.

Grantmakers in Health. Funding Health Advocacy. Washington, D.C., 2005. http://www.gih.org/usr_doc/issuebrief21_Funding_Advocacy.pdf

Trust for America's Health. Health Policy and Advocacy Resources. http://healthyamericans.org/policy/ And other resources on Suggest Reading list in this syllabus

3. **Interview with policy advocate**. Select a health professional or activist for whom policy advocacy is an essential part of what they do. A guide is that they spend at least half their time doing policy advocacy. Arrange a face-to-face interview with that person by March 1 following a question guide to be developed in class and write a 4-5 page summary of your interview due March 22. Let me know by email who you plan to interview (name, organization and job title) by no later than February 16 and be sure you have my ok for this person before scheduling interview. .

4 and 5. **Class Project and Presentation**

For this main assignment for the course, which you can complete with one other student, you will select a health advocacy campaign and prepare a written case study of that campaign, describing its activities and assessing its successes and limitations. You'll also present a summary of your findings to the class. Advocacy campaigns should be well underway (not in the planning stages), have been carried out in the New York area (unless you know you will have

access to leaders for out-of-area campaigns). Suitable campaigns will meet the following criteria:

1. An outcome clearly related to improved public health in New York
2. Access to leaders and members for visits and interviews
3. A written record of its activities that may include media coverage, web site reports, and promotional materials. You should be able to find at least three different accounts of the campaign, written from the vantage point of different stakeholders (e.g., leader, critic or opponent, and reporter)

Let me know which advocacy campaign you plan to profile by March 1, submit a one page description of the evidence you will use to write your case study by March 15 and submit a final draft on May 3 and the revised final paper on May 17th. Presentations will be in class on May 24. We'll develop guidelines for case study paper and presentations in class. Students are encouraged but not required to select policy advocate for interview who is connected to the campaign you will study.

6a. **Two short written assignments: op ed and legislative testimony 20% Due on 3/22 and 4/19 OR 6b. A 10-15 page policy advocacy report (20%) Due 4/19**

If you choose 6A: Submit these two assignments

i. Write an op ed (maximum 800 words) on a health advocacy topic. Guidelines to be distributed in class

ii. Prepare 3-4 (maximum 100 words) pages of legislative testimony supporting or opposing a specific health-related bill before the New York City Council, the New York State Legislature or the US Congress. Please follow guidelines for legislative testimony

First submission is due 3/22; second submission is due 4/19.

or 6B. Policy Advocacy Report (Due 4/19)

For this assignment, students prepare a 10-15 page policy report advocating for a specific policy approach for a specified audience (e.g., activists, City Council members, etc.) on a health policy issue relevant to NYC. MPH students who select this option will get extra credit if their submission meets professional standards, i.e., is close to ready for distribution. Sample reports will be distributed in class

Class Calendar

Date Topic	Skills Session	Assignments due	Notes
2/2 Course Introduction and Overview		2 profiles of activist and advocacy organization	
2/9 Advocacy within the Policymaking Process			
2/16 The Role of Evidence in Advocacy		Select and get faculty approval for person to interview for policy advocate interview	
2/23 The Structure of Government: Opportunities and Challenges for	SkillSession 1: Writing a position paper on a policy	Schedule interview	

Advocacy	issue for your agency		
3/1 Advocacy at the Individual and Family Levels		Submit name and brief description of advocacy campaign you plan to profile	
3/8 Theories and Models for Community-Level Advocacy	SkillSession 2: Writing a press release for an advocacy event		
3/15 The benefits and perils of advocacy coalitions	SkillSession 3: Writing a letter to the editor	Submit list of evidence you will use for your case study	
3/22 Using the Law for Advocacy.	SkillSession 4: Mastering IRS and state rules on non-profit lobbying	Submit write up of interview with policy advocate	
3/29 Legislative Advocacy Campaigns	SkillSession 5: Meeting with an elected official	6a. Short Paper 1 due	
4/5 The Special Challenges of Evaluating Advocacy Campaigns			
4/12 Pulling it all together: Planning an advocacy campaign. Steps and Principles	SkillSession 6: Preparing a social media advocacy campaign		
4/19 Pulling it all together Case Studies		6a. Short Paper 2 due 6b. Policy advocacy report due	
4/26	SPRING BREAK		
5/3 Training for advocacy and Media advocacy		Submit complete draft of case study paper	
5/10 One-on-one meetings	Individual meetings with instructor to review case study drafts		
5/17 TBA		Final Case Study Paper due	
5/24 Final presentations	TBA		

Grading

Grading criteria:

The grading scale follows the 2006-2009 Graduate catalog as follows:

A+	97.5%-100%	487.5-500.0	**B-**	80.0 – 82.4%	400.0-412.0
A	92.5 – 97.4%	462.5-487.5	**C+**	77.5 – 79.9%	387.5-399.5
A-	90.0 – 92.4%	450.0-462.0	**C**	70.0 – 77.4%	350.0-387.0
B+	87.5 – 89.9%	437.5-449.5	**F**	below 70%	349.5 and below
B	82.5 – 87.4%	412.5-437.0			

Class Attendance and Lateness Policy

Attendance will be taken. Each student is expected to attend and actively participate in each class. Students are expected to hand in all assignments on time. Any exceptions must be discussed with instructor in advance.

Academic Integrity Statement

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The

College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. More information can be found at: *http://www.hunter.cuny.edu/senate/assets/Documents/Hunter%20College%20Policy%20on%20Academic%20Integrity.pdf.*

Students with Disabilities

The Office of AccessABILITY provides services to all students with permanent or temporary disabilities to ensure that all Hunter College programs and activities are accessible. The program can assist students to maximize their potential while helping them develop and maintain independence. Additional information concerning disability services can be viewed at: http://www.hunter.cuny.edu/studentservices/access.

Course Communication and Assignment Submission

This course is delivered using the Blackboard course management system. In addition, students may be required to submit course assignments from time to time to the instructor "electronically" using Hunter or other CUNY e-mail. **An active Hunter or CUNY student e-mail user ID and password is required to log into both Blackboard and e-mail.** An active CUNY e-mail ID is required for non-Hunter students taking the class.

Blackboard and Hunter/CUNY e-mail will be used for communicating with the instructor, for receiving some supplemental course materials, and for submitting assignments. It is the responsibility of the student to remain current on this system.

Date Topic	xxxAssigned Readings for Session
2/2 Course Introduction and Overview	Read activist profile and view video as described on pages 3-4. Chapman, S. (2004). Advocacy for public health: A primer. *Journal of Epidemiology and Community Health*. 58, 361-365. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1732774/pdf/v058p00361.pdf 5 pages Bassett, Mary T. (2003). Public health advocacy. *American Journal of Public Health.* 93(8), 1204. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447936/?report=reader#__ffn_sectitle 1 page Chapman, S. (2001). Advocacy in public health: roles and challenges. *International Journal of Epidemiology,* 30, 1226-1232. http://ije.oxfordjournals.org/cgi/reprint/30/6/1226 7 pages Mullan, F. 2000. Don Quixote, Machiavelli, and Robin Hood: Public health practice, past and present. *American Journal of Public Health* 90:702–706. 5 pages http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1446241/pdf/10800417.pdf Discussion Questions: what is public health advocacy? What role does it play in public health practice? What do you need to learn to be an effective public health advocate?
2/9 Advocacy within the Policymaking Process	Kingdon J W, 2002, The reality of public policy in *Ethical Dimensions of Health Policy* By Marion Danis, Carolyn M. Clancy, Larry R. Churchill, editors, pp. 97-116. Available on Google books at http://books.google.com/books?hl=en&lr=&id=tIFvZI6IF-UC&oi=fnd&pg=PA97&dq=JW+Kingdon 20 pages Dorfman L, Wallack L, Woodruff K. More than a message: framing public health advocacy to change corporate practices. Health Educ Behav. 2005 Jun;32(3):320-36. http://www.bmsg.org/documents/6HEB-Dorfman.pdf Christoffel KK. Public health advocacy: Process and product. *American Journal of Public Health.*2000; 90(5), 722-6. 5 pages http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.90.5.722 Wallack L, Lawrence R. Talking about public health: developing America's "second language". Am J Public Health. 2005;95(4):567-70. 4 pages http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449221/pdf/0950567.pdf 4 pages American Cancer Society. Advocacy: Political Mapping Principles of Advocacy for Cancer Control NGOs. On Bb. 4 pages Discussion Questions: What are stages of the policy process? What role can advocacy play at each stage? Why are the language and "frames" that advocates use important?
2/18 The Role of Evidence in Advocacy	Freudenberg N, Tsui E. Evidence, power, and policy change in community-based participatory research. *Am J Public Health*. 2014 ;104(1):11-4. On Bb. Community Research Institute. Nonprofits and Data:A How-To Series 3 Using Data to Disseminate Information to Engage Community and Policymakers , 2006. Available at file:///C:/Users/User/Desktop/NP_data_3of6_SupportingAdvocacy2006%20(1).pdf 15 pages. Fafard P. Evidence and healthy public policy: Insights from health and political sciences. Canadian Policy Research Networks, 2008., read pp. 1-22 http://www.cprn.org/documents/50036_EN.pdf Mmatli TO. Translating disability-related research into evidence-based advocacy: the role of people with disabilities. Disabil Rehabil. 2008 Oct 21:1-9. On Bb. 11 pages Review this guide so you can use it for other assignments: Annie. Casey Foundation. A Handbook Of Data Collection Tools: Companion To "A Guide To Measuring Advocacy And Policy" 51 pages but skim so you can use it as needed don't need to read full text http://www.organizationalresearch.com/publicationsandresources/a_handbook_of_data_collection_tools.pdf

	Discussion Questions: What role does evidence play in the policy process? What types of evidence do health advocates use? Where do they find such evidence? What's the connection between evidence and power?
2/23 The Structure of Government: Opportunities and Challenges for Advocacy	**New York City government** Office of the Public Advocate. How New York City Government Works, pp. 1-6. http://archive.advocate.nyc.gov/files/OrganizingGuide-English.pdf NYC organizational chart http://www.nyc.gov/html/om/pdf/org_chart_citywide.pdf Understanding NYC's Budget A guide 16 pages http://www.ibo.nyc.ny.us/iboreports/understandingthebudget.pdf Rivin-Nadler M. Meet 3 Young Politicians Changing the Way New York City Works. The Nation. August 1, 2014. Available at: http://www.thenation.com/article/180841/meet-three-young-politicians-changing-way-new-york-city-works# **New York State** Frequently Asked Questions http://www.nysenate.gov/frequently-asked-questions#How_It_Works Governor Cuomo's 2014 State of the State Speech. Come to class prepared to discuss public health initiatives he discussed**.** **The Federal Government** American Psychological Association. A Psychologist's Guide to Federal Advocacy. Washington, D.C., APA, 2014. Available at: http://www.apa.org/about/gr/advocacy/federal-guide.pdf pp. 7-29 **Additional Resources if you want to know more)not required)** Congress http://www.theusgov.com/congres.htm Executive Branch http://infousa.state.gov/government/branches/executive.html Judicial Branch http://infousa.state.gov/government/branches/judicial_branch_interpreting.html Discussion Questions: What are the distinct opportunities for health advocacy within each branch and level of government? How can advocates use such regular governmental activities as budget hearings, agency oversight and legislative hearings as opportunities for advocacy?
3/2 Advocacy at the Individual and Family Levels	Negarandeh R, Oskouie F, Ahmadi F, Nikravesh M, Hallberg IR. Patient advocacy:barriers and facilitators. BMC Nurs. 2006 Mar 1;5:3. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1420298/pdf/1472-6955-5-3.pdf Children's Aid Society. Carrera Adolescent Pregnancy Program . On Bb Gilkey MB, Earp JA, French EA. What is Patient Advocacy? in Patient Advocacy for Health Care Quality: Strategies for Achieving Patient, Earp, French, Gilkey, eds, Sudbury MA: Jones and Barlett, 2008. Pp3-28. 25 pages. Available at : http://books.google.com/books?id=ReQKx1splwsC&pg=PA362&lpg=PA362&dq=patient+advocacy,+overview+and+critique.&source=bl&ots=NUXv4SUOqG&sig=hPvxaURxgp5CyMlKKnYOseXxfl8&hl=en&sa=X&ei=5JrxUM-xC6O30gHg8oGgAg&ved=0CEUQ6AEwBDgU#v=onepage&q=patient%20advocacy%2C%20overview%20and%20critique.&f=false Discussion Questions: What organizational factors facilitate or block health professionals from advocating for their patients or clients at the individual level? What are the limits of individual level advocacy?
3/9 Theories and Models for Community-Level Advocacy	Brown P, Zavestoski S, McCormick S, Mayer B, Morello-Frosch R, Gasior Altman R. Embodied health movements: new approaches to social movements in health. Sociol Health Illn. 2004 Jan;26(1):50-80. 31 pages http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9566.2004.00378.x/pdf Sabatier, Paul. Exploring an Advocacy Coalition Framework. Policy Sciences,1988; 21(2/3) 129-168. On Bb. 38 pages Re-read: Kingdon J W, 2002, The reality of public policy in *Ethical Dimensions of Health Policy* By Marion Danis, Carolyn M. Clancy, Larry R. Churchill, editors, pp. 97-116. Available on Google books at http://books.google.com/books?hl=en&lr=&id=tIFvZI6IF-UC&oi=fnd&pg=PA97&dq=JW+Kingdon 20 pages Discussion Questions: Why are theories of advocacy useful? What are the practical implications of social movement theory, the advocacy coalition framework and Kingdon's policy streams theory for deciding what advocates should do when?

3/16 : The benefits and perils of advocacy coalitions	Kadushin C, Lindholm M, Ryan D, Brodsky A, Saxe L.(2005). "Why It Is So Difficult to Form Effective Community Coalitions" *City and Community* 4:3, 255-275. http://djjr-courses.wdfiles.com/local--files/djjr-cv%3Aresearch/city-and-community-coalitions.pdf 21 pages. White JA, and Wehlage G. (1995). Community collaboration: if it is such a good idea, why is it so hard to do? *Educational Evaluation and Policy Analysis.*17:23-38 17 pages . http://files.eric.ed.gov/fulltext/ED364992.pdf Suggested Reading: Kegler, M.C., Williams, C.W., Cassell, C.M., Santelli, J., Kegler, S.R., Montgomery, S.B., Bell, M.L., Martinez, Y., Klein, J.D., Mulhall, P., Will, J.A., Wyatt, V.H., Felice, T.L.,and Hunt, S.C. (2005). Mobilizing communities for teen pregnancy prevention: Associations between coalition characteristics and perceived accomplishments. *Journal of Adolescent Health,* 37(3 Suppl), S31-S41. On Bb. 11 pages Discussion Questions: What are the benefits and limitations of coalitions for advancing health advocacy goals? How can advocates decide which coalitions to join and what role to play when they do?
3/23 Using the Law for Advocacy.	Kromm, Jonathan N., Shannon Frattaroli, Jon S. Vernick, and Stephen P. Teret. 2009. Public health advocacy in the courts: Opportunities for public health professionals. *Public Health Reports* 124:889–894. On Bb. 5 pages Pomeranz JL, Brownell KD. Advancing public health obesity policy through state attorneys general. *Am J Public Health*. 2011 ;101(3):425-31. http://www.yaleruddcenter.org/resources/upload/docs/what/law/ObesityPolicyAttorneysGeneral_AJPH_1.11.pdf Parmet WE, Daynard RA. The new public health litigation. *Annu Rev Public Health*. 2000; 21: 437-54. On Bb 18 pages Daynard RA, Howard PT, Wilking CL. Private enforcement: litigation as a tool to prevent obesity. J Public Health Policy. 2004;25(3-4):408-17. 10 pages http://www.palgrave-journals.com/jphp/journal/v25/n3/pdf/3190039a.pdf Suggested: Roa, Mónica, and Barbara Klugman. "Considering strategic litigation as an advocacy tool: a case study of the defense of reproductive rights in Colombia." *Reproductive health matters* 22.44 (2014): 31-41. Discussion Questions: What are the benefits and limitations of litigation (and more broadly use of the law) for advancing health goals? What roles can public health professionals play in the litigation process?
3/30 Legislative Advocacy Campaigns	Vernick JS. Lobbying and advocacy for the public's health: what are the limits for nonprofit organizations? Am J Public Health. 1999;89(9):1425-9. http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.89.9.1425 5 pages. Wallack L, Winett L, Nettekoven L. The Million Mom March: engaging the public on gun policy. J Public Health Policy. 2003;24(3-4):355-79. On Bb. 24 pages Work-Place Rules and Guidelines For Public Health Advocates. APHA Legislative Advocacy Handbook: *A Guide for Effective Public Health Advocacy* http://www.apha.org/NR/rdonlyres/256C8E98-AC70-4CD0-87BA-6EDC048DB0E8/0/RulesandGuidelinesPHAdvocates.pdf 5 pages Discussion Questions: What are the benefits and limitations of using the legislative process for advancing health goals? What roles can public health professionals play in the legislative process?
Spring Break	
4/13 The Special Challenges of Evaluating Advocacy Campaigns	Lindquist EA. Discerning Policy Influence: Framework for a Strategic Evaluation of IDRC-Supported Research**.** *School of Public Administration University of Victoria, 2001,* 28 pages On Bb. Harvard Evaluation Exchange (2007). Advocacy and Policy Change. The Evaluation Exchange, 13:1;1-16. http://www.hfrp.org/var/hfrp/storage/original/application/6bdf92c3d7e970e7270588109e23b678.pdf Organizational Research Services. A Guide to Measuring Advocacy and Policy 2007. http://www.aecf.org/upload/PublicationFiles/DA3622H5000.pdf Read pp. 1-28. Coffman J. A User's Guide to Advocacy Evaluation Planning. Harvard Family Research project. Available at: http://www.hfrp.org/publications-resources/browse-our-publications/a-user-s-guide-to-advocacy-evaluation-planning pp. 1-21 Discussion Questions: Why evaluate advocacy? How is evaluating advocacy different from (and similar to) evaluation of programs or services? What roles can public health professionals play in evaluation of advocacy?

4/20 Pulling it all together: Planning an advocacy campaign.	Freudenberg N. Public health advocacy campaigns to change corporate practices. In Wiist W.(ed) The Bottom Line or Public Health. On Bb. Loue S. Community health advocacy. J Epidemiol Community Health. 2006;60(6):458-63. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2563937/pdf/458.pdf 6 pages Community Tool Box. Chapter 33. Conducting a Direct Action Campaign Available at: http://ctb.ku.edu/en/tablecontents/chapter_1033.htm Sections 1-20. (Come to class prepared to give a 1 minute summary of what you learned from one section of this reading) Wallace,BC. "Crack, policy, and advocacy: A case analysis illustrating the need to monitor emergent public health-related policy and engage in persistent evidence-based advocacy." *Journal of Equity in Health* 3.1 (2014): 1-10. Available at: http://www.jehonline.org/2014/JEH-2014_No_11-Wallace_pp_139-160-released.pdf Discussion Questions: How can advocates fit together the components of an advocacy campaign to achieve the desired outcome? Make the whole more than the sum of the parts? What are different insights that come from short term and long term analyses of goals and accomplishments of advocacy campaigns?
4/27 Social Movements and Advocacy : Selected Case Studies	Case Study: The Treatment Action Campaign in South Africa Powers S. (2003) The AIDS Rebel: Letter from South Africa. The New Yorker 79:12, pp54-64. On Bb. Friedman S. & Mottiar S. (2004) Rewarding Engagement? The Treatment Action Campaign and the Politics of HIV/AIDS. Centre for Civil Society, University of KwaZulu-Natal. http://www.tac.org.za/Documents/AnalysisOfTAC.pdf 41 pages Freudenberg N, McDonough J, Tsui E. Can a food justice movement improve nutrition and health? A case study of the emerging food movement in New York City. J Urban Health. 2011;88(4):623-36. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3157506/pdf/11524_2011_Article_9598.pdf Keefe RH, Lane SD, Swarts HJ. From the bottom up: tracing the impact of four health-based social movements on health and social policies. J Health Soc Policy.2006;21(3):55-69. On Bb. Discussion Questions: What are the connections (and disconnects) between social movements and health advocacy campaigns? How can aligning with social movements advance health advocacy efforts? What do public health professionals and social movements have to offer each other?
5/4 Training for advocacy AND Media Advocacy	Read any four of the texts below most relevant to your advocacy aspirations carefully and skim the others. (1) Radius SM, Galer-Unti RA, Tappe MK. Educating for advocacy: recommendations for professional preparation and development based on a needs and capacity assessment of health education faculty. Health Promot Pract. 2009;10(1):83-91. http://hpp.sagepub.com.proxy.wexler.hunter.cuny.edu/cgi/reprint/10/1/83 (2) Hearne SA. Practice-based teaching for health policy action and advocacy. Public Health Rep. 2008;123 Suppl 2:65-70. http://www.ncbi.nlm.nih.gov.proxy.wexler.hunter.cuny.edu/pmc/articles/PMC2431098/?tool=pubmed (3) Pérez LM, Martinez J. Community health workers: social justice and policy advocates for community health and well-being. Am J Public Health. 2008;98(1):11-4. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2156047/ Sharma RR. An Introduction to Advocacy TRAINING GUIDE. On Bb. 146 pages Read and be ready to critique any 2 modules (4) Fenton Communications (2001). Now Hear This: The Nine Laws of Successful Advocacy Communications. www.fenton.com/FENTON_IndustryGuide_NowHearThis.pdf 25 pages (5)Kaiser Family Foundation (2006). New Media and the Future of Public Service Advertising: Case Studies. http://www.kff.org/entmedia/upload/7469.pdf 16 pages (6) Zoller HM. Health Activism: Communication Theory and Action for Social Change. *Communication Theory2005;* 15(4): 341-364. http://www.stes-apes.med.ulg.ac.be/Documents_electroniques/MET/MET-COM/ELE%20MET-COM%20A-8200.pdf 24 pages (7) ICT Facts and Figures 2011. On Bb. 8 pages (8) Rainie L, Smith A, Schlozman KL, Brady H. Social Media and Political Engagement. Pew Research Center. 2012 On Bb. 13 pages

	Fenton Communications. (2005).Ten Tips to Get More Ink on Our Next Report. www.fenton.com/FENTON_IndustryGuide_InAStudyReleasedToday.pdf (9)Jones P, Comfort D, Hillier, D. Anti-corporate retailer campaigns on the internet. International Journal of Retail & Distribution Management. 2006 ;34 (12):882 – 891. On Bb 10 pages. (10) Galer-Unti, Regina A. 2010. Advocacy 2.0: Advocating in the digital age. *Health Promotion Practice* 11:784–787. On Bb. Discussion Questions: How can advocates train others to sustain and advance the advocacy work? How can social media contribute to advocacy? What are their limitations?
5/11	Student presentations
5/19 Final session	Meet with instructor for feedback and discussion Discussion Questions: To achieve your professional goals, what else do you need to learn about advocacy? What did you learn about yourself as a public health professional this semester? What are the key values you hope to advance in your career? What role, if any, will advocacy play in promoting these values?

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
HPM 750: Public Health Management
3 Credits
Spring 2016

Time and location	Tuesdays from 6:05 to 7:50 PM Silberman (2180 3rd Ave), Room 221
Instructor	Vicki Breitbart, EdD, LCSW Email: vickibreitbart@yahoo.com Telephone: (347)-267-6339
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Focuses on management issues in a variety of organizational settings and the larger public health environment; describes managerial functions and problem solving strategies, financial management principles, and management models for change; develops specific skills in program management, budgeting, workforce development, and managing intersectoral programs.
Course prerequisites	PH756; PH755
Course format	This course will rely heavily on experiential learning (e.g. participation and attendance is expected and required).Some of the course will be taught via "case studies" that outline real-world scenarios that have taken place in healthcare and related settings. We will also use role-play, small group problem solving, individual presentation, and ample amounts of class discussion to explore management challenges and approaches. Students will participate in study groups that serve as vehicles for analyzing the concepts in the reading material. These study groups will meet in class to prepare responses to questions handed out in advance of the session. If you are going to be absent, be sure to notify me in advance and arrange with a classmate to get the prep questions.
Required reading and resources	**Johnson, Spencer MD Who Moved My Cheese ISBN 0-399-14446-3** **Available from Amazon used for $.01** **Harvard Business Review** http://hbr.org/?conversationId=1237405 Sign up for an account **Public Health Management and Practice** http://journals.lww.com/jphmp/pages/default.aspx **All Readings or other references will be posted on Blackboard.**
Suggested reading and resources	

Copmpetencies
This course will help students to achieve the following competencies expected of all MPH graduates:
1. Analyze management challenges that arise in public and private (for profit and not-for profit) healthcare settings related to public health using a variety of tools.
2. Develop and understand budgeting and understand the difference between fixed and variable costs and distinguish between capital and operating budgets.
3. Identify several professional opportunities in public health that can utilize management and supervisory skills.
In addition, by the end of this course, students will be able to:
 Describe their own personal characteristics as related to management and where their own supervision and management challenges lie.
 Define alternative approaches to leadership and management in the context of health care organizations.
 Utilize effective communication styles for hiring, supervising and managing staff.
 Construct program management tools for monitoring and evaluating individual, program and institutional performance.
 Identify approaches to dealing with the changing healthcare environment.

Course Assessment
Classroom participation will constitute 20% of the grade

The course will benefit greatly from the variety of backgrounds and perspectives held by the students. The more students put into the classes, the more they will get out of them. For that reason, participation is a key component of the course and will count for 20% of the final grade.

Written assignments will constitute another 40% of the grade:

1) "Shadowing" assignment
   Students will schedule a time to "shadow" a manager in a healthcare or non-profit setting. This should be an opportunity to observe a manager in action, in meetings, supervising staff, planning, and or trouble shooting. I will provide a series of questions that will serve as a guide for the report on the management and supervisory challenges you witness. Answers o several questions will constitute the outline for the paper of not more than 5 pages **due on 3/22 and be expected to share their findings in class on that day.** The "shadow" assignment with report back in class will count for 20% of the final grade.
2) Health Care Innovation
   Students will identify an area of change that has occurred as a result of the Affordable Care Act and discuss a management technique or approach that will be needed to implement this change in a healthcare setting. This can be the student's organization or the organization visited as part of the shadowing assignment. The approach should be evidenced based with effectiveness demonstrated in the literature. In a paper of about 5 pages in length, students will discuss the health care change, and the efficacy or expected of the approach to change. **This paper is**

due 4/12 and the students are expected to discuss their findings as part of the class on that day. This assignment will constitute 20% of the final grade.

Class presentation will constitute 20% of the grade

Students will be asked to identify either a management technique or approach and analyze its effectiveness based on the literature. Students will write up the evidence they have found to prove or disprove the efficacy of the approach in a paper of about 5 pages. A number of possible topics will be provided in class**. This paper is due 5/10. Students will be asked to present their findings in class discussion on either 5/10 or 5/17**. This will count for 20% of the grade. Students are not expected to provide PowerPoint presentation, but to participate in a review of the findings and recommendations in a class discussion. Assignments handed in late may affect the student's grade.

Final exam will constitute 20% of the grade:

The final exam will be an on-line assignment posted at **6:00 on 5/3 to be returned by 8:00 PM that same evening.** It will involve a review of class work and readings and/or a case study with a number of questions that parallel the types of inquiry we will undertake as a class throughout the semester. The final will count for 20% of the grade.

Class participation	20%
Shadowing paper	20%
Affordable Care Act change paper	20%
Evidenced-based management presentation	20%
Final	20%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal

are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

I. 2/2/16: Introduction. Being a Manager

No class on 2/9/16. Classes follow a Friday schedule.

2. 2/16/16: Organization Mission, Vision, Values and Strategic Planning

Readings:
"National Campaign to Prevent Teen Pregnancy", Harvard Business School Publishing*

Drucker, PF "Self-Assessment Tool".
http://www/leadertoleader.org/leaderbook/sat

3. 2/23/16: Building the Learning Organization

Readings:
Senge. P The Fifth Discipline. Chs. 1 and 2

Pfeffer J, Sutton RI "Evidenced-based management" *Harvard Business Review*. January 2006*

Aragon TJ, Garcia BA. Designing a Learning Health Organization for Collective Impact. *Public health Management and Practice.* Jan/Feb. 2015 (21) S24-33.
http://journals.lww.com/jphmp/Fulltext/2015/01001/Designing_a_Learning_Health_Organization_for.5.aspx

Optional
Garvin DA. Edmondson AC, Gino F. "Is yours a learning organization?" Harvard Business Review. March 2008 *

4. 3/1/16: Staff performance and management

Readings:
Senge P. The Fifth Discipline. Ch. 8,9,10.

Gladwell M. "The newboy network". *The New Yorker*. 5/29/2000 pp.68-86.

Goleman. Working with Emotional Intelligence, Ch. 12

Optional
Gary L. "Performance management that drives results" Harvard Business Review. Sept. 2004 *

5. 3/8/16: Health Care Center visits

6. 3/15/16: Supervising effectively

Prior to class, please go on line to: http://www.humanmetrics.com/cgi-win/JTypes2.asp
and do the quick personality profile based on Meyers Briggs. The key is not to think about the items, just go with your gut. Review and bring notes about your "type" for class discussion.
Also complete The Collaborative Leadership - Self Assessment Questionnaire:. https://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fwww.partneringintelligence.com%2Fdocuments%2F5.02_CollaborativeLeadershipAssessment.doc

Readings:
Fryer, B. "The Micromanager" *Harvard Business Review*. Sept. 2004 Update. Aug. 2007*

Borkowski N. Organizational behavior, theory and design in health care. Jones and Bartlett. 2009.Ch. 13

Optional
Hill, LA. "Becoming the Boss" Harvard Business Review. Jan. 2007 *

Bielaszka-Duvernay C. A CEO's six steps to effective feedback" Harvard Management. *

7. 3/22/16: Management as Leadership in Health Care

Readings:
Goleman D. "Leadership that gets results" *Harvard Business Review*. March-April 2000*

Tervalon M, Murray-Garcia J. Cultural humility versus cultural competence: A critical distinction in defining physician training outcomes in multicultural education. Journal of Health Care for Poor and Underserved. 9 (2) 1998.

Nicholson, N. "How to motivate your problem people". Harvard Business Review. January 2003*
NIH CLAS Standards – http://www/omhrc.gov/assets/pdf/chdcked/executive.pdf

Optional
Davidson M. "Leveraging difference for organizational excellence: Managing diversity differently" Harvard Business Review. Dec. 2002*

Eagley AH, Carli LL. "Women and the labyrinth of leadership"'. *Harvard Business Review.* Sept. 2007 *

George B, Sims P, Mclean AN, Mayer D. "Discovering your authentic leadership" *Harvard Business Review*. Feb. 2007*

Ulrich D, Smallwood N “Five Steps to building your personal leadership brand” Harvard Business Review. Dec. 2007*

8. 3/29/16: Health Care Management and Administration in Health Care

Readings:

Herzlinger RE, Lallman J, Kane N. “Retail Medical Centers. Health Stop (A): Strategy. Harvard Business School Publishing. *

9.4/5/16: Organization Development

Readings:

Borkowski N. Organizational behavior, theory and design in health care. Jones and Bartlett. 2009. Ch. 17,18.

Leider, JP, Castrucci BC, Russo P, Hearne S. Perceived impact of health care reform on large urban health departments. *Public health Management and Practice*. Jan/Feb. 2015 (21) S66-S75 http://journals.lww.com/jphmp/Fulltext/2015/01001/Perceived_Impacts_of_Health_Care_Reform_on_Large.10.aspx

Optional

Herzlinger R. “Why innovation in healthcare is so hard”. Harvard Business Review. May 2006;58-66 *

10. 4/12/16: Systems Thinking for Health Care Organizations

Readings:

Senge P. The Fifth discipline. Chs.3,Part II

Leischow SJ, Milstein B. “Systems thinking and modeling for public health practice” . *AJPH* 96 (3);403405. 2006

Midgley G. “Systemic intervention for public health”. *AJPH* 96(3) ;466-472. 2006

Argyris, C “Double loop learning in Organizations” *Harvard Business Review*. Sept. 1977*

Maister DH. University Health Services: Walk-in Clinic” Harvard Business School Publishing. *

Optional

McCauley M. “Continuous Quality Improvement Initiatives at Queen Mary Hospital”. *Harvard Business School Publishing* *

Nohria N. Joyce W. Roberson B. “What really works” *Harvard Business Review*. July 2003 *

Hammond JS, Keeney RL and Raiffa H. “The hidden traps in decision making” *Harvard Business Review*. January 2006*

11.4/19/16: Team and Community building

Readings:

Senge P. The Fifth Discipline. Ch. 11

Gladwell M. “The bakeoff” The New Yorker 9/5/2005

Krieger N. On Becoming a Public Health Professional: Reflections on Democracy, Leadership, and Accountability Journal of Public Health Policy 1990; 11(4) 412-419.

Optional

Katzenbach JR. Smith DK “The discipline of teams” Harvard Business Review. July 2005*

No class on 4/26 – **Spring break**

12. 5/3/16: Final EXAM – on-line

13. 5/10/16 Evidenced-based management presentations

14. 5/17/16: Evidenced-based management presentations

The CUNY School of Public Health
Campus [Hunter]
Public Health Management
HPM 75000 01 (Code 1166), Spring 2016

Catalogue description	Focuses on management issues in a variety of organizational settings and the larger public health environment; describes managerial functions and problem solving strategies, financial management principles, and management models for change; develops specific skills in program management, budgeting, workforce development, and managing intersectoral programs. (Prerequisites: PH 75500, PH 75600)
Course meets	Room SB 326, Thursdays 6:05 PM – 7:50 PM
Instructor	George A, Schwartz, Adjunct Lecturer, Urban Public Health
Email	george.schwartz@hunter.cuny.edu, gschwartz27@gmail.com
Phone/Text	212 777-5255
Office hours	Thursdays before/after class or by appointment
Required text	Burton, Lawton Roberts, *et al*. Shortell & Kaluzny's Health Care Management: Organization Design & Behavior, Delmar Cengage Learning, Clifton Park, NY. ISBN-13: 978-1-4354-8812-2, ISBN-10: 1-4354-8812-2. (Text or electronic edition. In addition to the bookstore, you may view the publisher's web site for purchase options: http://www.cengagebrain.com/course/site.html?id=1-1ZBUFAE.)
Reserve material	Reading assignments and the class calendar are posted on Blackboard.
Other readings	Required readings from journals are posted by links through the Hunter/CUNY library system. You will click the links in Blackboard and log into the library system using the identification number found on the back of your Hunter OnePass ID card.

Important Dates and Deadlines

Class	*Due Date(s)*	*Assignment*
Class 5	03/03/16	Short paper due
Class 8	03/24/16	In-class midterm
Class 2 - 7	02/11/16 to 03/17/16	First team presentations
Class 9 – 13	03/31/16 to 05/05/16	Second team presentations
Class 14 - 15	05/12/16 to 05/19/16	Individual presentations
Class 15	05/19/16	Final projects submitted

Assessment

Method of Evaluation/Grading

Grading criteria:

Short paper	100 points
Midterm exam	125 points
In-class journal article reviews	100 points
Final project in-class presentation	50 points
Final project paper	125 points
Total	**500 points**

The grading scale follows the Graduate catalog:

A+	97.5%-100%		B-	80.0 – 82.4%
A	92.5 – 97.4%		C+	77.5 – 79.9%
A-	90.0 – 92.4%		C	70.0 – 77.4%
B+	87.5 – 89.9%		F	00.0 – 69.9%
B	82.5 – 87.4%			

Short paper

With your workplace as a model, describe your organization in terms of the management theories, leadership styles and motivational techniques represented there. How do these theories, styles and techniques serve to advance or hinder your organization's mission? What would you change, and how would you accomplish that change? This should be a 3 to 5 page paper, double spaced; it does not have to be footnoted but it does have to demonstrate knowledge of the material covered in class and in the text and assigned articles through the first four classes. This paper is due in class March 5. 2016.

In-class journal article reviews

Student teams will be responsible for summarizing and presenting the findings of the journal articles that are assigned each week. These presentations will be brief (5-10 minutes), may utilize PowerPoint, and should help the class make the connection between the text assignment and the articles. (Class size will dictate team size – I would assume 2 or 3 persons for each team).

Midterm exam

There will be a one-hour, in-class, closed book midterm examination on March 24, 2016 covering material from the text, class lectures and the other assigned readings to date. It will include multiple choice questions and short essays.

Final presentation and paper

Working alone, each student will prepare and present a research paper on a topic of personal interest in health care management. You will be expected to read and cite at least three scholarly articles on the subject, clearly explain how this management policy or recommended changes of policy will affect health care and/or save money and/or improve the performance of health care organizations in the US. You should focus on the

appropriate and unbiased use of management tools in the articles themselves and in making the argument for taking your approach to the problem. Your in-class presentations, occurring on May 12 and May 19, should take approximately 10 to 15 minutes, allowing time for questions, and your final paper, due for submission in class May 19, should be 5-10 pages typed double-spaced as well as fully sourced and footnoted. You may use PowerPoint or other visual aids or handouts in your presentations. All final projects require the approval of the instructor.

(Suggestions for possible financial projects will be posted to Blackboard.)

Class Policies

Class participation

Students should read the subject material prior to attending class. Students should participate in class discussions and should ask relevant questions during class time.

Lateness, absences and late submission of assignments

Each student is expected to attend and actively participate in each class. One absence is allowed. Each additional absence will result in a penalty of 5 points from the final grade, with almost no exceptions. Late assignments will be penalized at the rate of 5 points taken off per day of lateness.

Course Communication and Assignment Submission

Some course assignments will be delivered using the Blackboard course management system or the Hunter College e-mail system. **An active Hunter student e-mail user ID and password is required to log into both systems.** An active CUNY e-mail ID is required for non-Hunter students taking the class. All students are issued a free e-mail account when registering for classes for the first time.

Blackboard and Hunter e-mail may be used for communicating with the instructor, for receiving some supplemental course materials, and for submitting assignments. It is the responsibility of the student to remain current on this system.

Institutional Policies

Academic Integrity Statement

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

"Any deliberate borrowing of the ideas, terms, statements, or knowledge of others without clear and specific acknowledgement of the source is intellectual theft and is called plagiarism." "It is not plagiarism to borrow the ideas, terms and statements, or knowledge of others if the source is clearly and specifically acknowledge. Students who consult such critical material and wish to include some of the insights, terms or statement encountered must produce full citations in an appropriate form." Hunter College 2006-2009 Graduate Catalog, page 17

More information can be found at:
http://www.hunter.cuny.edu/senate/assets/Documents/Hunter%20College%20Policy%20on%20Academic%20Integrity.pdf.

Students with Disabilities

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Grade of Incomplete

THERE IS NO ABSOLUTE RIGHT TO A GRADE OF INCOMPLETE. Only students averaging B or above in a course are eligible to request an incomplete course grade. Graduate students have one academic year in which to submit the missing work otherwise the IN grade is permanent on the college transcript. A specific, written agreement between the instructor and the student that details the requirements for making up the incomplete is also required.

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SUMMARY OF COURSE LEARNING OBJECTIVES

Apply relevant theoretical/conceptual models and leadership principles to developing health policy and administrating health programs	∗ Describe tradeoffs associated with different leadership styles ∗Explain barriers to decision making and organizational change	Final project and paper
Evaluate public health programs and health policies and apply evaluation results to their improvement	∗ Describe the relationship among organizations, health care services and public health	In-cIass journal reviews
Identify and discuss the partnership and collaborative skills needed to develop effective public health programs and policies	∗Analyze the tradeoffs associated with different types of partnerships, and be able to identify when a partnership between organizations is likely to result in a successful outcome	Short paper
Analyze and critically evaluate theoretical and conceptual models used to describe the U.S. health care system and the delivery of health care	∗Identify theories of internal and external organizational behavior 8Analyze how organizational behavior and individual behavior within organizations contributes to success or failure, and how those outcomes can be measured	Midterm

The CUNY School of Public Health
Campus [Hunter]
Management of Health Organizations
HPM 75000 01 (Code 1166), Spring 2016

Class Calendar and Required Readings

Before you get to the calendar of topics and assigned readings, here are some important questions to keep in mind throughout the semester:

- Are we discussing an issue of policy or an issue of management? How can we tell? Why is this distinction significant?

- Why do not-for-profit organizations and government agencies also need to make a "profit?"

- What are appropriate financial goals for management? Are policies that reduce competition and increase profits (or cash flow) acceptable? Under what conditions?

- What are legitimate, ethical strategies for improving organizational performance?

- What is the role of ethical standards of behavior in the management of health care organizations? What principles (should) apply to the individual manager and to the organization?

- How do we improve consumer behaviors without taking coercive measures? How can we extend the notion of personal responsibility for good health?

- How do we deal with information asymmetry between consumers and providers in public health and the health care system? Again, what degree of coercion is ethical? What can be done to increase informed and, presumably, wise decision making by consumers?

Class 1, February 4, 2016
Course introduction, class rules and requirements, assignments and due dates
The management challenge in health care

Text, chapter 1, pp. 1- 12

What is unique about health care?
Why should we consider it a business?
The value equation in health care

Class 2, February11, 2016
Management theories

Text, chapter 1
Box
Perry

A short history of management science
Differences in approaches to management among private, public and not-for-profit entities

Class 3, February 18, 2016
Leadership

Text, chapter 2
McCrae
Shanafeldt
Weisman

Leadership vs. management
The agency relationship in health care
What is different about leadership in health care/public health?
What are the best practices?

Class 4, February 25, 2016
Motivating and managing people

Text, chapter 4
O'Leary
Behn

Hierarchy of needs
Motivation vs. performance

Class 5, March 3, 2016
First Assignment Due

Organization design

Text, chapter 3
DeVore
Goldsmith
Kessell

Teamwork
Specialization
Integration
Accountable Care Organizations (ACOs)

Class 6, March 10, 2016
Communication skills, tools and strategies
Diversity

Text, chapters 5, 6
De Leon-Siantz
Mattson
Nunez-Smth
Parston

Within health care organizations
With patients and consumers
With regulators
With the public

Class 7, March 17, 2016
Complexity and innovation

Text, chapter 8
Beitsch
Chesluk

Health care is a complex system
Teaching new skills
Fostering innovation

Class 8, March 24, 2016
In-Class Midterm Exam

Professor's special on Palliative Care

Temel
May

Palliative care for cost control and better health care

Class 9, March 31, 2016
Conflict management
Performance measurement

Text, chapter 7
PorterC
Behn (revisited)
Mattson (revisited)
O'Leary (revisited)

Competing demands on resources
Power relationships

Class 10, April 7, 2016
A Deep Dive into Diversity in the Health Care Workplace

Dobbin <1>
Dobbin <2>

The significance of diversity
What has worked to change corporate and bureaucratic cultures?
Effects on employees
Effects on their organizations
Effects on patients and clients: the special case of health care
Developing constructive diversity programs

Class 11, April 14, 2016
Strategic thinking
TQM and other "systems" for improvement
Measurement

Text, chapter 9
Litvak
Manary
Randolph
Smith

How do we measure the impact of management?
How do we know we are doing well or poorly?
Connection to the value equation

Class 12, April 21, 2016
Public policy

Text, chapters 11, 12
Cramm
Kessell (revisited)
de Oliveira
Melnick

Implementation of ACA
Forecasting needs and demands for health care
Adapting the organization to changing clientele

Class 13, May 7, 2015
Ethics, Expectations and The Future

Text, chapters 10, 14
Jarris
Rutkow
Verni

What constitutes ethical behavior in the health care manager?
Ethical dilemmas
How do we ethically help our agencies achieve the best possible outcomes?

Class 14, May 12, 2016 Class 15, May 19, 2016
Final Presentations,
Final Written Projects Submitted May 19, 2016

THE CUNY SCHOOL OF PUBLIC HEALTH

Hunter College

HPM 752 Comparative Analyses of Urban Health Care Systems

Instructor	*Justin P. Swearingen, DrPH (ABD), MHA*
Course Meets	*Online*
Class Location	*Online via Adobe Connect and Blackboard*
E-Mail	*JSwearingen@gradcenter.cuny.edu*
Office Hours	*By Appointment*
Program Office	*2180 Third Ave., New York, NY 10035; 212-481-5111*
Program website	*http://www.hunter.cuny.edu/uph*

CATALOGUE LISTING:

HPM 752, Comparative Analyses of Urban Health Care Systems, 3 credits

(Prerequisites PH 755, PH756).

Examines unique challenges and opportunities for delivering health care in developed and developing world cities; analyses impact of national and local policies and social and political factors on health access, quality and outcomes for urban populations; introduces empirical methods for making comparative studies across municipalities and nations.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify and analyze the legal, economic, ethical and health bases and implications of public health policies that affect urban populations	• Compare and contrast healthcare delivery in U.S. cities with healthcare delivery in cities in both the developing and the developed world • Examine the uses and limits of comparative analysis in learning from other cities in the developed and developing world	*Paper 1, Paper 2, Final Presentation, Final Paper*
Apply strategies for advocating for effective public health policies and programs	• Analyze the strategies and solutions that municipal health care systems have used to address identified problems and engage in prevention and health promotion	*Paper 3, Final Presentation, Final Paper*
Evaluate public health programs and health policies and apply evaluation results to their improvement	• Apply lessons from one urban area to problems faced by another	*Paper 1, Paper 2, Final Presentation, and Final Paper*
Identify and discuss the partnership and collaborative skills needed to develop effective public health programs	• Apply lessons from one urban area to problems faced by another	*Paper 1, Paper 2 Final Presentation, and Final Paper*

and policies		
Analyze and critically evaluate theoretical and conceptual models used to describe the U.S. health care system and the delivery of health care	• Describe the roles of city, state and federal government in promoting health and preventing disease	*Paper 1, Paper 2, Paper 3, Final Presentation, and Final Paper*

CLASS FORMAT:

This class is an on-line hybrid class that is taught in ten sessions. Some sessions will be completed independently (with deadlines as listed in the schedule). Other sessions are LIVE online and require that the student attend the virtual classroom with others in the class. Students can log-in from anywhere with an internet connection. Additionally, students will participate in online discussion groups that require posting throughout the semester.

This is an entire 3 credit course in 4 weeks. The sessions are fast paced and it is expected that each student will be prepared for and actively participate in each class, both live and Blackboard only.

Class	Date	Type	Location	Time	DUE
1 Intro	1/4/2016	Blackboard	Online		Prepare for Paper 1
2 US	1/6/2016	LIVE	Adobe Connect	6:00-9:00pm	Blackboard (BB) Discussion Item 1 by 11:59pm
3 Germany	1/8/2016	Blackboard	Online		Paper 1 due by 11:59pm
4 Japan	1/11/2016	Blackboard	Online		BB Discussion Item 2 by 11:59pm. Prepare for Paper 2.
5 Canada	1/13/2016	Live	Adobe Connect	6:00-9:00pm	BB Discussion Item 3 by 11:59pm
6 UK	1/15/2016	Blackboard	Online		Paper 2 due at by 11:59pm
7 India/Portugal	1/18/2016	Blackboard	Online		BB Discussion Item 4 by 11:59pm
8 France	1/20/2016	Blackboard	Online		Paper 3 due by 11:59pm
9 Global	1/22/2016	Blackboard	Online		BB Discussion Item 5 by 11:59pm
10 Presentations	1/25/2016	Live	Adobe Connect	6:00-9:00pm	Final Presentations (live). Final Paper due by 11:59pm (post AND email)

REQUIRED BOOKS

1. Johnson JA, Stoskopf C. (2011). Comparative Health Systems: Global Perspectives. Jones & Bartlett Publishers: Toronto. ISBN-13: 978-1449625610
2. Reid TR. The Healing of America: A Global Quest for Better, Cheaper, and Fairer

Health Care. Penguin Press. ISBN-10 1594202346 ISBN-13 9781594202346. Available at Amazon and other major book stores.

OTHER MATERIALS

Power-point lectures, web-casts and other electronic media will be posted on-line to Blackboard weekly. Professional journal and popular press articles will also be provided both by the instructor and the students as topics become newsworthy over the semester.

ADDITIONAL RESOURCES

Well respected sources of in-depth information include:

- Dept. Health Human Services (DHHS) data: https://www.healthdata.gov/
- CDC Community Health Status Indicators: http://wwwn.cdc.gov/CommunityHealth/homepage.aspx
- World Health Organization: http://www.who.int/research/en/
- Center for Strategic and International Studies: http://csis.org/regions
- The Kaiser Family Foundation: http://www.kff.org/
- The Commonwealth Fund: http://www.commonwealthfund.org/
- Robert Wood Johnson Foundation: http://www.rwjf.org/
- The Dartmouth Atlas of Health Care: http://www.dartmouthatlas.org
- Families USA: http://familiesusa.org/
- The Institute for Healthcare Improvement (IHI): http://www.ihi.org
- Agency for Healthcare Research and Quality (AHRQ): http://www.ahrq.gov/
- National Committee for Quality Assurance: http://www.ncqa.org
- National Association of Community Health Centers: http://www.nachc.org/
- US Dept. of Health and Human Services: http://www.healthcare.gov/
- The New York Times: www.nytimes.com (Ex: Topics- Health Care Reform)
- Various other International, Federal, State, and Private Agencies*

**** All references must come from non-partisan, non-opinion published resources.***

TECHNOLOGY REQUIREMENTS

Students will need access to Blackboard for this course. It is the responsibility of the student to obtain and maintain this access. We will be using the Adobe Acrobat Connect Pro System for our live sessions. Detailed requirements can be found at:
http://www.hunter.cuny.edu/it/it-services/adobe-connect

In order to participate, you will need the following:
1. Updated Internet Explorer, Mozilla Firefox, or Safari. Cookies must be enabled.

2. Updated Flash Player (might be necessary, so test your system)
(Download the free Flash player at: http://get.adobe.com/flashplayer/)

3. A high speed internet connection (the software does not work as well from slow wireless internet).

4. Once all of this is in place, you can simply click on the link provided by the professor which will take you directly to the live session.

COURSE PHILOSOPHY:

This course is meant to be valuable as well as fun. It is also designed to be intellectually challenging, interactive, and relevant to your needs now and in the future. The course utilizes a variety of teaching styles and learning methods including webcasts, instructional videos, documentaries, and traditional articles and books. Through such engagement, it is my hope that at the end of the course you end up being an "International Health Policy Star" – the person that your family, colleagues and friends turn to when they are confused and need an explanation about what is happening with global health policy. At the very least, I hope that you will say that you like global health policy better than you did when you started the class.

ASSIGNMENTS:

GRADING CRITERIA:

PARTICIPATION IN CLASS AND ON-LINE DISCUSSION BOARDS	20
SHORT PAPERS (3)	50
FINAL PRESENTATION	10
FINAL PAPER	20
TOTAL	100 POINTS

THE GRADING SCALE:

A+	**97.5%-100%**	**B-**	**80.0 – 82.4%**
A	**92.5 – 97.4%**	**C+**	**77.5 – 79.9%**
A-	**90.0 – 92.4%**	**C**	**70.0 – 77.4%**
B+	**87.5 – 89.9%**	**F**	**BELOW 70%**
B	**82.5 – 87.4%**		

1. Class participation (20% of grade)

   - Participation is graded and there is an expectation that you to have done all the required material for class. This will make the course sessions much more productive. As such, students should read the subject material prior to attending class and arrive ready for active discussion. Students will be called upon to answer questions relating to the material and actively participate in the class discussions during each of the live sessions, so proper preparation is required.

   - On-line Discussion Boards (included in participation grade):

- For many classes, students will be required to answer the on-line discussion board question and respond to the on-line postings by other students in their city/country "group."

- Students will also be expected to read and respond to the posted papers of other group members.

2. Short Papers (50% of grade)

Students will write three short (3-4 page) papers (**please do not exceed 5 pages**)

These papers will be posted to the city/country discussion board for other students to read and comment upon. It is expected that each student will read and make substantive comments about the posted papers of other students in their group.

Short papers are 3-4 pages typed double spaced not including tables, figures and references. Each short paper should have at least 8 relevant references of which some should be from class readings and others not. References need to be from peer-reviewed journal articles or from non-partisan, non-opinion governmental or non-governmental resources (websites/white papers). No Wikipedia references and no opinion pieces. Topics are listed below.

Papers should be posted to Blackboard in your city group discussion board on Blackboard by 11:59pm on the date indicated in the syllabus. Please post both as full-text in the posting so that your fellow students can easily read it and with a Word attachment for the instructor to grade.

**** Remember, when evaluating a city, there are city-level, state-level, and country-level health policies that might need to be considered. ****

Paper 1 (20%): Define the characteristics of your urban city and country (20%)- may need to use outside resources. Evaluate its health system in terms of cost, quality, and access (50%). Using specific examples, describe at least two challenges of providing health care to the population (30%).

Paper 2 (20%): Define "access to health care" OR "quality of health care" (20%). Using specific examples, describe at least two specific challenges to achieving access or quality in your city (40%). Using specific examples, describe at least two ways your city does well in this area (40%). (Your challenges may be the same as in Paper 1).

Paper 3 (10%): Equitable care was defined by the IOM as care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, or socioeconomic status. Describe two challenges that NYC faces in providing equitable health care to all its citizens (40%). Make sure to include data indicating the scope of the problem (20%). For one of these challenges, analyze how a specific policy in the Affordable Care Act will help to meet this challenge (40%).

3. Final Presentation (10% of final grade)

   Each student pair will post a 10 minute presentation in PowerPoint to the class discussion board. These will be presented live on the last day of class. Please locate a computer with a working microphone or contact the professor for assistance.

4. Final Paper (20% of final grade)

   Perform a Comparative Analysis of how your world city addresses the challenges of access, cost, quality, prevention, and equity compared to New York City.

   Students will work in pairs to write 12-15 pages (not including references or tables)

   Details of this assignment will be posted to Blackboard.

   ****Can use country-level data as a proxy when city data is not available****

   Your paper should follow this outline, using section titles as headers for that section:

   - Executive Summary (no more than 1 page single spaced)- 10%
   - Introduction – Briefly introduce and discuss the purpose of the paper – 5%
   - City profile – Discuss the demographic and socioeconomic characteristics of the city (within the larger country), the overall health care system (in terms of cost, quality, access, equity and prevention), and major system health challenges (can micro such as obesity, macro such as long wait times for procedures, or both). Include tables to summarize this information – 25%
   - Major health system challenge detail – Go into more detail (qualify and quantify) one of the major health challenges. Asses the city's success in addressing this challenge- 10%
   - Compare/Contrast to NYC - Compare and contrast the health system in which this city finds itself to that which New York City funds itself (in terms of cost, quality, access, equity and prevention). Make sure to include changes that the Affordable Care Act will bring and include these in your evaluation- 25%
   - Discuss lessons that NYC (within the US) can learn from your international city- 15%
   - Summary/ Conclusions- 10%

   References: At least 15. Classroom readings can be used, but outside references will also be necessary.

COURSE POLICIES:

SYLLABUS CHANGE POLICY

This syllabus is a guide for the course and is subject to change with advance notice. Changes to the syllabus will be announced in class and posted to Blackboard as an announcement.

CLASS PARTICIPATION

Class participation is graded (20% of final grade). As such, students should read the subject material prior to attending class and arrive ready for active discussion. Students will be called upon to answer questions relating to the material, so proper preparation is required.

ATTENDANCE, LATENESS, AND ABSENCES

Every student is expected to attend every class (in-person or on-line). Without excuse from the instructor, each additional absence will result in a 5% reduction from the final grade.

Without sufficient reason (Ex: sickness) and email approval from the instructor, late assignments will be penalized at a rate of 5 percentage points taken off per day of lateness.

WRITTEN ASSIGNMENTS

All assignments should be typed, double spaced, 11 or 12 point font (depending on your style). Use the citation style of your choice, but be consistent throughout the paper.

ASSIGNMENTS SUBMISSION

All assignments should be submitted in person or via blackboard (I will specify depending on the assignment) prior to the beginning of class on the assignment's due date. It is expected that your writing will be of graduate-level quality, presented in a readable and professional manner.

COURSE COMMUNICATION

This course is delivered using the Blackboard course management system. In addition, students may be required to submit course assignments from time to time to the instructor "electronically" using Hunter or other CUNY e-mail. An active Hunter or CUNY student e-mail user ID and password is required to log into both Blackboard and e-mail. An active CUNY e-mail ID is required for non-Hunter students taking the class. This class also uses Adobe Connect as the venue for the 'live' classes and for some of the lectures. Students will need, at a minimum, a computer with speakers and a microphone to participate. An aftermarket headset/microphone combination is acceptable. In addition, we strongly recommend that students have a webcam.

Blackboard and Hunter/CUNY e-mail will be used for communicating with the instructor, for receiving some supplemental course materials, and for submitting assignments. It is the responsibility of the student to remain current on this system.

GRADE OF INCOMPLETE

There is absolutely no right to a grade of incomplete. Only students averaging B or above in a course are eligible to request an incomplete grade. Graduate students have one academic year in which to submit the missing work otherwise the "IN" grade is permanent on the college transcript. A specific, written agreement between the instructor and the student that details the requirements for making up the incomplete is also required.

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http://www.hunter.cuny.edu/senate/assets/Documents/Hunter%20College%20Policy%20on%20Academic%20Integrity.pdf

STUDENTS WITH DISABILITIES

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HELP WITH RESEARCH AND WRITING

The School of Health Sciences is committed to improving the writing skills of our students. If you feel you need assistance in strengthening your writing skills, take advantage of the materials developed by the Writing Center that are available on their website at http//rwc.hunter.cuny.edu, or sign up for tutoring at the Writing Center (Room 416 Thomas Hunter Hall, 212-650-3937). As a substantial portion of your grade in this course is based on written assignments, you are advised to take advantage of Hunter's writing assistance services early in the semester.

The Hunter College reading/writing center has a wealth of helpful material about how to write outlines and papers. You should access and use this material throughout this course. http://rwc.hunter.cuny.edu/

GRADE APPEALS

Grades can be appealed in a progressive order to the instructor, School Director and the Hunter College Senate. When a student considers a final course grade unsatisfactory, the student should first confer with the instructor regarding the accuracy of the grade received. Graduate students have the right to request in writing that the Director of the School of Health Sciences appoint a student as a member to the department/School Grade Appeals Committee. This appeal conference should be held within the first five weeks of the semester following receipt of the grade, in accordance with the "College-wide Grade Appeals Procedures" adopted by the Senate in fall 1985. See Hunter College Graduate Catalog for more information

Date	Topics	Readings prior to class	
Class 1	Intro to Class A frame for examining how international countries and cities deliver healthcare: Access, Quality, Cost, Equity, Prevention. Cities, the built environment and health. Empirical issues in cross-cultural comparisons.	**READ:** Text: Johnson and Stoskopf. Comparative Health Systems: Chapter 1 Book: Reid TR. The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care: Chapters 1-3 Read: the 2015 Revision of World Urbanization Prospects: Summary and Key Findings http://esa.un.org/unpd/wpp/Publications/Files/Key_Findings_WPP_2015.pdf and explore the overall site: http://esa.un.org/unpd/wpp/	
Class 3 (Class 2 is below)	Berlin and Germany	**READ:** TEXT: Johnson and Stoskopf. Comparative Health Systems. Chapter 8: Germany BOOK: Reid TR. The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care: Chapter 5: Germany: "Applied Christianity" ARTICLES: 2014. Khazan, Olga. What American Healthcare Can Learn From Germany. The Atlantic. http://www.theatlantic.com/health/archive/2014/04/what-american-healthcare-can-learn-from-germany/360133/	

Date	Topics	Readings prior to class	
		2012. Moving Forward with Wellness Incentives Under the Affordable Care Act: Lessons from Germany Harald Schmidt, Stephanie Stock, and Tim Doran http://www.commonwealthfund.org/~/media/Files/Publications/Issue%20Brief/2012/May/1603_Schmidt_moving_forward_wellness_incentives_germany_intl_brief.pdf The Commonwealth Fund. International Profiles of Health Care Systems, 2012. The German Health Care System. Miriam Blümel, p46-52 http://www.commonwealthfund.org/Publications/Fund-Reports/2012/Nov/International-Profiles-of-Health-Care-Systems-2012.aspx **LISTEN:** RADIO: National Public Radio (NPR): Most Patients Happy With German Health Care by Richard Knox http://www.npr.org/templates/story/story.php?storyId=91971406 **WATCH:** DOCUMENTARY: PBS Documentary: Sick Around the World. Chapter 3: Germany **http://www.pbs.org/wgbh/pages/frontline/video/flv/generic.html?s=frol02p101&continuous=1** **ADDITIONAL INFORMATION:** Busse R, Blümel M. (2014). Germany: Health System Review. Health Systems in Transition. Volume 16, No 2. http://www.euro.who.int/__data/assets/pdf_file/0008/255932/HiT-Germany.pdf?ua=1 The Commonwealth Fund (2013). International Profiles of Health Care Systems, 2013:	

Date	Topics	Readings prior to class	
		Australia, Canada, Denmark, England, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United States. http://www.commonwealthfund.org/publications/fund-reports/2013/nov/international-profiles-of-health-care-systems Wiesmann. "German health reformers face political pitfalls" Financial Times, August 17, 2010: http://www.ft.com/intl/cms/s/0/d0ef3c12-a961-11df-a6f2-00144feabdc0.html#axzz2FH3akemv Kaiser Family Foundation, "Cost Sharing for Health Care" France, Germany, and Switzerland" January 2009 pp 1-11 http://www.kff.org/insurance/upload/7852.pdf	
Class 2 **(Class 3 is above)**	New York and the United States	**READ:** TEXT: Johnson and Stoskopf. Comparative Health Systems. Chapter 21: The Changing US Health System ARTICLES: 1. Is the Affordable Care Act Working? 2014 (Oct). New York Times: http://www.nytimes.com/interactive/2014/10/27/us/is-the-affordable-care-act-working.html#/ 2. Quealy, K., Sanger-Katz, M. Obama's Health Law: Who Was Helped Most (2014). http://www.nytimes.com/interactive/2014/10/29/upshot/obamacare-who-was-helped-most.html# 3. Mangan, D. Obamacare effect: Uninsured rate hits record low. (2015). http://www.cnbc.com/id/102313931#.	

Date	Topics	Readings prior to class	
		WATCH: ANIMATION: • Video #1: Confused about how the new health reform law really works? Health Reform Hits Main St. Kaiser Family Foundation. http://healthreform.kff.org/the-animation.aspx • Video #2: The YouToons Get Ready for Obamacare: Health Insurance Changes Coming Your Way Under the Affordable Care Act. Kaiser Family Foundation. http://kff.org/health-reform/video/youtoons-obamacare-video/ YOUR CHOICE: Either watch the film or read about it in the New York Times compilation: • Watch: "Frontline, "Obama's Deal; Inside the backroom deals and hardball politics that got Obama his health care bill", April 2010. (56 minutes) This documentary will provide reference for several units in the class. It is a history of the health care reform bill in the USA and an example of how health policy is made. Note the lucid explanation of the behind-the-scene agreements between the policy makers and the stakeholders. http://video.pbs.org/video/1468710007 **And/ Or Read**: • http://topics.nytimes.com/top/news/health/diseasesconditionsandhealthtopics/health_insurance_and_managed_care/health_care_reform/	

Date	Topics	Readings prior to class	
		INTERACTIVE FEATURES: ONLINE POLE: Take a short, 10-question "quiz" (not graded) to test your knowledge of the law, and then find out how you compare to the rest of the country. **Bring results to online class** http://healthreform.kff.org/Quizzes/Health-Reform-Quiz.aspx BROWSE *at least one* of the Interactive Timelines: 1. History of reform going back to 1920: http://www.nytimes.com/interactive 2. Healthcare.gov, "Understanding the Affordable Care Act: What's Changing and When?" http://www.healthcare.gov/law/timeline/index.html 3. Kaiser, "Implementation Timeline," by year: http://healthreform.kff.org/timeline.aspx **ADDITIONAL INFORMATION** (Optional): 1. Want to see what the entire piece of legislation looked like? For your curiosity: this is NOT required reading: The health reform bills: PPACA & HCERA, Public Laws 111-148&111-152 http://www.ncsl.org/documents/health/ppaca-consolidated.pdf 2. Overview of Law: George Washington University —Health Reform GPS: Navigating the Implementation. http://healthreformgps.org/summary-of-the-legislation 3. Overview of Law: Kaiser Family Foundation, —Summary of the New Health Reform Law, http://www.kff.org/healthreform/upload/8061.pdf	

Date	Topics	Readings prior to class	
Class 4	Tokyo and Japan	**READ:** Text: Johnson and Stoskopf. Comparative Health Systems. Chapter 11: Japan Book: Reid TR. The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care: Chapter 6: Japan: Bismarck on Rice . Articles: • Ikeda, N at al. What has made the population of Japan healthy? Lancet 2011; 378: 1094–105 (attached in Blackboard) • The Commonwealth Fund. International Profiles of Health Care Systems: The Japanese Health Care System, 2012 Ryozo Matsuda. P66-71 http://www.commonwealthfund.org/~/media/Files/Publications/Fund%20Report/2012/Nov/1645_Squires_intl_profiles_hlt_care_systems_2012.pdf . **WATCH:** Documentary: PBS Documentary: Sick Around the World. Chapter 2: Japan **http://www.pbs.org/wgbh/pages/frontline/video/flv/generic.html?s=frol02p101&continuous=1** News: 1. CNN: Japan's Health Care System: http://youtu.be/PFqgsUdR81g 2. PBS: Health Care in Japan: http://youtu.be/nzXFOMLuqq8	

Date	Topics	Readings prior to class	
		LISTEN: Radio: National Public Radio (NPR): Japanee Pay Less for More Health Care http://www.npr.org/templates/story/story.php?storyId=89626309 **ADDITIONAL INFORMATION:** World Health Organization (WHO). Country Profiles: Japan. 2015. http://www.who.int/countries/jpn/en/ Browne,l. (2012). Japan Tops List of Healthiest Countries. ABC News. http://abcnews.go.com/blogs/health/2012/12/13/japan-tops-list-of-healthiest-countries/	
Class 5	London and the United Kingdom	**READ:** Text: Johnson and Stoskopf. Comparative Health Systems. Chapter 5: United Kingdom Book: Reid TR. The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care: Chapter 7: UK: Universal Coverage, No Bills Articles: • The Commonwealth Fund. International Profiles of Health Care Systems: The English Health Care System, 2012 Harrison, A. P32-38 http://www.commonwealthfund.org/~/media/Files/Publications/Fund%20Report/2012/Nov/1645_Squires_intl_profiles_hlt_care_systems_2012.pdf • Cheng, T. "Nice Approach" The Financial Times (2009). http://www.ft.com/cms/s/0/5be67610-9ce2-11de-ab58-00144feabdc0.html	

Date	Topics	Readings prior to class	
		. **WATCH:** Documentary: PBS Documentary: Sick Around the World. Chapter 1: Great Britain **http://www.pbs.org/wgbh/pages/frontline/video/flv/generic.html?s=frol02p101&continuous=1** Cartoon: Cartoon produced by the UK Ministry of Health to explain the National Health Service. (65 years ago): http://www.youtube.com/watch?v=Zb7dnD1jap8&feature=colike News: • CNN: British Health Care Explained- http://www.youtube.com/watch?v=3wWrBaQjkvo&feature=colike • (Optional) Tribute to the NHS during the Opening Ceremony of the 2012 Olympic Games: http://vimeo.com/47528368 **LISTEN:** Radio: National Public Radio (NPR): Barker, V. UK Leader Pushes Sweeping Changes To Health Care: http://www.npr.org/templates/story/story.php?storyId=129112347 **Additional Material:** Davis K, Stremikis K, Squires D, Schoen C. (2014). Mirror, Mirror on the Wall, 2014 Update: How the U.S. Health Care System Compares Internationally. The Commonwealth Fund. http://www.commonwealthfund.org/publications/fund-reports/2014/jun/mirror-mirror	

Date	Topics	Readings prior to class	
Class 6	Toronto and Canada	**READ:** Text: Johnson and Stoskopf. Comparative Health Systems. Chapter 4: Canada . Book: Reid TR. The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care: Chapter 8: Canada . Articles: Health Affairs, 30, no.2 (2011):274-283 Health Services, Still Have Poorer Health: Lesson From Canada's Universal Care: Socially Disadvantaged Patients Use More. http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&ved=0CDkQFjAB&url=http%3A%2F%2Ftelessaude.bvs.br%2Ftiki-download_file.php%3FfileId%3D2367&ei=HzXuUJf5PIPsqAH8xoHICQ&usg=AFQjCNFtHikMfICRra3YXW0vgj2aD5T41A&bvm=bv.1357700187,d.aWM Starfield, B. Reinventing Primary Care: Lessons From Canada. HEALTH AFFAIRS 29, NO. 5 (2010): 1030–1 036. http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-primary-care-policy-center/Publications_PDFs/A249.pdf . **WATCH:** Presentation: Union Presentation: US vs Canada Healthcare: http://youtu.be/wBVilDwAAUg News: Canadian Broadcasting Corporation (CBC): Premier Wall discusses health care on CBC's Power & Politics http://youtu.be/eiIZjF-yR8s .	

Date	Topics	Readings prior to class	
		LISTEN: Radio: CBC Radio Canada: http://www.cbc.ca/video/watch/AudioMobile/MorningNorth/ID=2295852214 If link does not work, put this into google and it's the first link: "CBC Radio Canada- Medicare: The Royal Commission on Health Services. Digital Archives (1964)" http://www.cbc.ca/player/Digital+Archives/Health/Health+Care+System/ID/1811602858/ **ADDITIONAL MATERIAL** Khazan O. (2014) What If America Had Canada's Healthcare System? The Atlantic. http://www.theatlantic.com/health/archive/2014/10/what-if-america-had-canadas-healthcare-system/381662/ Kliff S. (2012) Everything you ever wanted to know about Canadian health care in one post. The Washington Post. http://www.washingtonpost.com/blogs/wonkblog/wp/2012/07/01/everything-you-ever-wanted-to-know-about-canadian-health-care-in-one-post/	
Class 7	Mumbai and India And Lisbon and Portugal	**READ:** Text: Johnson and Stoskopf. Comparative Health Systems. Chapter 7: Portugal Johnson and Stoskopf. Comparative Health Systems. Chapter 13: India	

Date	Topics	Readings prior to class	
		Book: Reid TR. The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care: Chapter 9: Out of Pocket Articles: Al Jazeera News: India marks one year since last polio case. 2012. (Read or watch)- http://www.aljazeera.com/news/asia/2012/01/201211371212764515.html Simoes, J. The Portuguese Healthcare System: Successes and Challenges. Siemens Medical Solutions. 2012. http://www.medical.siemens.com/siemens/en_GB/rg_marcom_FBAs/files/brochures/magazin_medsol_2012_02/MedSol_2012_2_Essay_Portugal.pdf **WATCH:** India's health-care system: Cashless, portable and paperless. The Economist online: http://www.economist.com/blogs/banyan/2012/09/indias-health-care-system?bclid=0&bctid=1833291783001 Bill Gates Foundation: Delivering Health Care in India- http://youtu.be/aq2h-DR3kBo European Journal. Portugal: Seeking Help from the Neighbors. http://youtu.be/ZWdPplFihwc News: CNN: India's Health Care System- http://youtu.be/RNM1BsTSzvs VOA News: Survival of Portuguese Health Care Questioned http://www.voanews.com/content/survival_of_portuguese_health_care_questioned/1105581.html	

Date	Topics	Readings prior to class	
		. **LISTEN:** Radio: Australian Broadcasting Corporation (ABC): India's Medical Tourism Industry Booming- http://www.radioaustralia.net.au/international/radio/onairhighlights/indias-medical-tourism-industry-booming National Public Radio (NPR)- Tough Cuts In Portugal May Be Exacting High Toll- http://www.npr.org/player/v2/mediaPlayer.html?action=1&t=1&islist=false&id=150580358&m=150584114	
Class 8	Paris and France	**READ:** Text: Johnson and Stoskopf. Comparative Health Systems. Online Chapter: France (not in the printed book- posted in Blackboard) . Book: Reid TR. The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care: Chapter 4: France . Articles: Torsoli, A. France's Health-Care System Is Going Broke. Bloomberg Business Week. 2013 http://www.businessweek.com/articles/2013-01-03/frances-health-care-system-is-going-broke The Commonwealth Fund. International Profiles of Health Care Systems, 2012. The French Health Care System. p39- 45 http://www.commonwealthfund.org/~/media/Files/Publications/Fund%20Report/2012/Nov/1645_Squires_intl_profiles_hlt_care_systems_2012.pdf .	

Date	Topics	Readings prior to class	
		WATCH: CBS Sunday Morning. France: 'Best' Health Care? http://youtu.be/uNR_6UuVl4s News: Press TV: Health sector protests against privatization http://www.dailymotion.com/video/xu5dko_health-sector-protests-against-privatization_news?ralg=meta2-only#from=playrelon-2 Press TV: French healthcare sector continues protests- http://www.dailymotion.com/video/xvkji9_french-healthcare-sector-continues-protests_news CNN: France's health care system- http://youtu.be/nkkNyBCgypA . **LISTEN:** Radio: Nation Public Radio (NPR)- Health Care Lessons From France- http://www.npr.org/player/v2/mediaPlayer.html?action=1&t=1&islist=false&id=92419273&m=92452309	
Class 9	Global Challenges and Opportunities	**READ:** Text: Johnson and Stoskopf. Comparative Health Systems. Online Chapter: 23 Comparative Global Challenges and Opportunities . Book: Reid TR. (2009). Finish the rest of the book	

Date	Topics	Readings prior to class	
		Articles: United Nations- Universal Declaration of Human Rights (Preamble): http://www.un.org/en/documents/udhr/index.shtml . World Health Organization- Background Paper on Conceptual Issues Related to Health Systems Research to Inform a WHO Global Strategy on Health Systems Research http://www.who.int/alliance-hpsr/alliancehpsr_backgroundpaperhsrstrat1.pdf If link does not work, google "Health Care Delivery System Reform and The Patient Protection & Affordable Care Act- A Report from Senator Sheldon Whitehouse for the U.S. Senate Committee on Health, Education, Labor & Pensions" and it is the first Pdf (from March, 2012) http://www.whitehouse.senate.gov/imo/media/doc/Health%20Care%20Delivery%20System%20Reform%20and%20The%20Affordable%20Care%20Act%20FINAL2.pdf **WATCH:** International Monetary Fund: The Economics of Public Health Care Reform in Advanced and Emerging Economies. (Concentrate on the questions and consider maintaining an interest in the subject through further readings beyond this course) http://www.imf.org/external/mmedia/view.aspx?vid=1574358086001 . World Bank- Health Systems Create Healthy Futures: Meet Maya http://youtu.be/PFVCNUOM5Us World Bank- Get Well, Maya: Universal Health Coverage Ensures Healthy Futures http://youtu.be/6prBrGHI2Ws . News: Global Health TV: Health System Strengthening http://globalhealthtv.com/conference_tv/v/health_system_strengthening/	

Date	Topics	Readings prior to class	

Class 10	Discussion & Student Presentations	• Finish final paper
		• Prepare for live class presentation
		  ○ 10 minute presentation
		  ○ Partners will present together	

HEALTH ECONOMICS (3 credits)
HPM 755.00 - 01
Spring 2016
Thursdays, 8:00 – 9:45 pm, Silberman 320
Silberman Campus, East Harlem

Michele J. Siegel, Ph.D.
Adjunct Associate Professor, Health Policy and Management
CUNY School of Public Health
E-mail: ms1950@hunter.cuny.edu
Office Hours: By Appointment

Pre-requisites
PH 75600
PH75500

Brief Course Description

The purpose of this course is to introduce students to essential microeconomic concepts as they apply to health systems, individual and public health, particularly in urban settings. Students will become familiar with the role of economics in health policy, analyze health care and health insurance in the frame work of classical economic theory, and critically evaluate health care systems.

Specialization Competencies	Learning Objectives	Assessment Methods
Apply relevant theoretical/conceptual models and leadership principles to developing health policy	Apply economic theory to analyze health policy	Weekly assignments, exams
Identify and analyze the legal, economic, ethical and health bases and implications of public health policies that affect urban populations	Discuss the role of economics in health policy	Weekly assignments, exams
Identify non-public health policies and describe how they can mitigate or exacerbate health disparities and influence the health of urban populations	Assess the need for non market-based suppliers of health care	Weekly assignments, exams
Analyze and critically evaluate theoretical and conceptual models used to describe the U.S. health care system and the delivery of health care	Assess the utility of economic theory to analyze the US health care system	Weekly assignments, exams
Apply economic concepts and theories to the analysis of health care policy and management issues that inform decision-making and policy development	Analyze the demand for and supply of health, health care, and health insurance in the classical economic theoretical framework	Weekly assignments, exams

Class Format/Learning Methods

This class will meet exclusively in person. Please see the course schedule for meeting dates and locations. The work is a combination of lectures, readings, tests, and weekly assignments. It is expected that each student will be prepared for and actively participate in each class.

Required Readings

Santerre and Neun's Health Economics: Theory, Insights, and Industry Studies, 6th Edition. Note: if the 6th edition is too expensive, you may also use the 4th or 5th editions.
Dewar's Essentials of Health Economics, 2nd Edition. Note: if the 2nd edition is too expensive, you may also use the 1st edition.

Method of Evaluation

Class Attendance & Participation

Attendance is required and is a graded part of the course. Participation is also required and graded. Participation in discussion includes asking questions, answering questions, and other thoughtful or intelligent contributions to the discussion. Students will be called upon to answer questions relating to the material, so proper preparation is required. I may not lecture on all of the readings. I will let you know which readings to prioritize a week in advance.

Weekly Assignments

Class sessions will include brief written assignments. These will be graded on a three point scale. Please proofread your work and correct grammatical and typographical mistakes.

Midterm Exam and Final Exam

There will be a take-home mid-term exam on microeconomic principles applied to health, and a take home essay-based final examination.

GRADING AND ASSESSMENT:

Grading for the course

- Class Participation & Attendance 20%
- Weekly Assignments 30%
- Take-home Midterm 25%
- Essay based take home Final Exam 25%

Graduate Center Grade Policy

- A (plus or minus)—Excellent
- B (plus or minus)—Good
- C (plus or minus)—Fair (lowest passing mark)
- W — Withdrew without academic penalty. This is a student-initiated grade, which may be requested from the fourth through the tenth week of the semester. Under no circumstances can a student withdraw and receive a —W grade after the tenth week of the semester without the written permission of the course instructor and the Executive Officer, and the approval of the Vice President for Student Affairs. This grade carries tuition liability.
- F—Failure

Graduate Center Policy on INC Grades

To resolve incomplete grades, students must fulfill their obligations within one calendar year after completion of the course. After one year, an incomplete (INC) will automatically be transformed into an INP (permanent incomplete); extensions will be granted only in exceptional circumstances upon written

application and with the permission of the faculty member, the Executive Officer, and the Vice President for Student Affairs. Permanent incompletes will accrue no credit. Incomplete grades cannot be changed to letter grades after a student has been advanced to candidacy and has been moved to Level III. Students with more than two incomplete courses will be brought to the attention of their Executive Officer to determine whether or not they are making satisfactory progress. Students will not normally be regarded as making satisfactory progress toward their degrees if they have more than two INCs on their records. (Please refer to Standards for Retention below, and to page 63 of this handbook.) Students should be aware that continued registration and most financial aid awards are conditional upon satisfactory progress. Students should also note that credits for which they have an INC as of the end of the third week of classes of a given semester are not counted toward advancement to the next level for that semester.

Information on Access to the Office of Disabled Students

CUNY GRADUATE CENTER: Among other responsibilities, the CUNY Graduate Center Vice President for Student Affairs has overall responsibility for Student Disability Services and is the 504/ADA Coordinator. Contact information: Vice President for Student Affairs - Matthew G. Schoengood, Room: 7301. Telephone: 212-817-7400 Email: studentaffairs@gc.cuny.edu

HUNTER COLLEGE: The Office of AccessABILITY provides services to all students with permanent or temporary disabilities to ensure that all Hunter College programs and activities are accessible. The program can assist students to maximize their potential while helping them develop and maintain independence. Additional information concerning disability services can be viewed at: http://www.hunter.cuny.edu/studentservices/access.

Course Communication and Assignment Submission

This course is delivered using the Blackboard course management system. Blackboard's email service will be used for class communication. It is the responsibility of the student to check the email account that is linked with the Blackboard system.

Class Attendance Policy

Class attendance is essential. Each student is expected to attend and actively participate in each class. One absence is allowed. Each additional absence will result in a penalty from the course grade, with almost no exceptions.

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. Changes to the syllabus will be announced in class and posted to Blackboard as an announcement.

Due Dates for Midterm and Final Exams

Class 7: March 17th	Take Home Midterm Exam Distributed
Class 8: March 31st	Take Home Midterm Exam Due
Class 14: May 19th	Take Home Final Exam Distributed
Class 15: May 26th	Take Home Final Exam Due

Schedule

Required Readings by Session (Read Before Class) –Readings may change*	
Class 1 February 4th	**Topic:** Course Introduction and Overview. What is health economics? Readings: ▪ Goldhill, D. How American health care killed my father. The Atlantic, September 2009. http://www.theatlantic.com/magazine/archive/2009/09/how-american-health-care-killed-my-father/307617/ ▪ Gawande, A. Big Med, Annals of Health Care, New Yorker, August 13, 2012 http://www.newyorker.com/magazine/2012/08/13/big-med ▪ Dewar Chapter 1: U.S. Healthcare System Issues ▪ Dewar Chapter 2: The Role of Economics ▪ Arrow, Kenneth. Uncertainty and the Welfare Economics of Medical Care, *American Economic Review,* Dec 1963.
Class 2 February 11th	**Topic**: Review of Key Concepts in Economics. Readings: ▪ Santerre and Neun Chapter 1: Introduction ▪ Santerre and Neun Chapter 2: Health and Medical Care: An Economic Perspective ▪ Rice, T. Can markets give us the health system we want? *Journal of Health Politics, Policy and Law*, 1997 April; Vol. 22, No. 2 ▪ Sarpel U, Vladeck BC, Divino CM, Klotman PE. Fact and Fiction Debunking Myths in the US Healthcare System. *Annals of Surgery.* 2008 April; 47(4): 563-569.
Class 3 February 18th	**Topic**: Reading Scientific Articles Readings: ▪ A primer. Purugganan M, Hewitt J. How to read a scientific paper. Cain Project for Engineering and Professional Communication Rice University, 2004. ▪ Basset, MT et al. Purchasing behavior and calorie information at fast-food chains in New York City, 2007. *American Journal of Public Health*, August 2008, Vol 98, No. 8. ▪ Zhang et al. Unmet eyecare needs among US 5th grade students. *Am J Prev Med* 2012; 43(1): 55–58. ▪ Elbel et al. Calorie labeling and food choices: A first look at the effects on low-income people in NYC. *Health Affairs*, 28, no.6 (2009):w1110-w1121.

Class 4 February 25th	**Topic**: Linear Regression in Health Economics Readings: ▪ Kleinbaum et al. Chapter 8: Multiple Regression Analysis ▪ Kleinbaum et al. Chapter 9: Testing Hypotheses in Multiple Regression ▪ Kleinbaum et al. Chapter 12: Regression Diagnostics. ▪ Fernald LCH: Socio-economic status and body mass index in low-income Mexican adult *Social Science and Medicine*. 2007; 64: 2030-2042. ▪ Monk-Turner E. Economic returns to community and four-year college education. *Journal of Socio-economics*. 1994; 23(4): 441-448 ▪ Video on linear regression: http://www.youtube.com/watch?v=833V0NaSVu4
Class 5 March 3rd	**Topic:** Grossman's Demand for Health Model Readings: ▪ Grossman, Michael. On the Concept of Health Capital and the Demand for Health, *Journal of Political Economy; 1972,* 80 (2): 223–255 ▪ Leibowitz AA. The demand for health and health concerns after 30 years. *Journal of Health Economics* 2004; 23:663-671. ▪ Gupta N. and Greve J. Overweight and obesity and the Demand for Primary Physician Care. IZA Discussion Paper No. 4098 March 2009. ▪ Dewar Chapter 6: The Demand for Health
Class 6 March 10th	**Topic**: Demand for Healthcare Readings: ▪ Kenkel, DS. The Demand for Preventive Medical Care. *Applied Economics* 1994 26(4) 313-325. ▪ Dewar Chapter 4: The Demand for Health Care, pages 25-30 ▪ Santerre and Neun Chapter 5: Demand for Medical Services.
Class 7 March 17th	Midterm Exam Distributed **Topic**: Healthcare Supply and Costs Readings: ▪ Health Care Costs: A Primer. Key information on health care costs and their impact. Henry J. Kaiser Family Foundation, March 2009. ▪ Dewar Chapter 6: Health Production, Costs, and Supply
March 24	**No Class--Classes Follow a Friday Schedule**

Class 8 March 31st	Midterm Exam Due **Topic:** Private Health Insurance and Moral Hazard Readings: ▪ Santerre and Neun Chapter 11: The Private Health Insurance Industry ▪ Gladwell, M. The Moral-Hazard Myth. The New Yorker, August 29, 2005. ▪ Nyman, John A. Is Moral Hazard Inefficient? *Health Affairs*, Vol 23, No. 5 ▪ Arrow, Kenneth. Uncertainty and the Welfare Economics of Medical Care, *American Economic Review,* Dec 1963.
Class 9 April 7th	**Topic:** Government Health Insurance, Access to Care and Costs Readings: ▪ Santerre and Neun Chapter 10: Government as Health Insurer (please double check this is the correct number of this chapter, as you may have a different edition of the text) ▪ Gruber, J. and Simon, K. Crowd-Out 10 Years Later: Have Recent Public Insurance Expansions Crowded Out Private Health Insurance? *Journal of Health Economics*, Vol 27: 2008. ▪ Baicker, K. The Oregon Experiment, *New England Journal of Medicine,* 2013. ▪ Taubman et al. Medicaid Increases Emergency Department Use: Evidence from Oregon's Health Insurance Experiment, *Science*, 343:2014
Class 10 April 14th	**Topic:** Overview of Randomized Controlled Designs and Rand Health Insurance Experiment; Discussion of Basic Econometric Designs. Readings: ▪ Welch BL et al. The Rand Health Insurance Study: a summary critique. *Medical Care.* 1987. 25:148-156. ▪ Aron-Dine A. et al. The Rand Health Insurance Experiment, Three Decades Later. *Journal of Economic Perspectives*, Vol 27, number 1: 2013 ▪ Brook R. et al. Does Free Care Improve Adult Health? *New England Journal of Medicine*: Vol 309, 1983 ▪ Manning et al. Health Insurance and the Demand for Medical Care. *American Economic Review*, Vol 77: No 3: 1987.
Class 11 April 21st	**Topic:** The Affordable Care Act Readings: ▪ Focus on Health Reform. Summary of Coverage Provisions in the Patient Protection

	and Affordable Care Act. ▪ Major Provisions of the Affordable Care Act By Years (ACA) http://www.commonwealthfund.org/Health-Reform/Health-Reform-Resource.aspx ▪ Blumenthal et al. The Affordable Care Act at 5 Years, *New England Journal of Medicine.* 2015 ▪ Han, Xuesong, et al. "Has recommended preventive service use increased after elimination of cost-sharing as part of the Affordable Care Act in the United States?" *Preventive medicine* 78 (2015): 85-91. ▪ Pande, A et al. Effects of Healthcare Reforms on Coverage, Access, and Disparities, American Journal of Preventive Medicine, July 2011:41:1 ▪ Abraham J. How Might the Affordable Care Act's Coverage Expansion Provisions Influence Demand for Medical Care? *The Milbank Quarterly*, Vol 92: No 1: 2014.
April 28th	**No Class—Spring Recess**
Class 12 May 5th	**Topic:** Quality of Care and P4P Readings: ▪ Emmert, M. et al. Economic Evaluation of Pay –For-Performance in Health Care: A systemic Review. *European Journal of Health Economics, 2012.* ▪ Sherilyn K. Does Performance Based Remuneration for Individual Health Care Practitioners Affect Patient Care. *Annals of Internal Medicine*, 2012. ▪ Werner, R. and Dudley R. Medicare's New Hospital Value-Based Purchasing Program is Likely to Have Only a Small Impact on Hospital Payments, *Health Affairs*, 31:9:2012
Class 13 May 12th	**Topic:** The Economics of Obesity Readings: ▪ Grossman and Mocan. Economic Aspects of Obesity. *NBER*. April 2011. ▪ Finkelstein E. and Strombotne, The Economics of Obesity, *The American Journal of Clinical Nutrition*, 2010. ▪ Brownell, K. The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages, *New England Journal of Medicine*, Oct 2009. ▪ Cawley J. The Economics of Childhood Obesity. *Health Affairs*, 29:3:2010. ▪ Taubes G. "Is Sugar Toxic?" *The New York Times.* April 13, 2011 http://www.nytimes.com/2011/04/17/magazine/mag-17Sugar-t.html?pagewanted=all

Class 14 **May 19th**	**Take Home Final Exam Distributed** **Topic:** The Economics of Addiction Readings: ▪ Becker GS, Murphy KM. A theory of rational addiction. *Journal of Political Economy*. 1988; 96: 675-700. ▪ Grossman M, Chaloupka FJ. The demand for cocaine by young adults: a rational addiction approach. *Journal of Health Economics*. 1998; 17:427-474. ▪ Sloan FA, Wang Y. Economic theory and evidence on smoking behavior of adults. *Addiction.* 2008; 103: 1777-1785. ▪ Camerer C. Behavioral economics. Reunifying psychology and economics. *Proc Nat Acad Sci*. 1999; 96:10575-10577.
Class 15 May 26th	**Take Home Final Exam Due** **Topic:** Adolescent Health Readings: ▪ Markowitz S, Kaestner R, Grossman M. An investigation of the effects of alcohol consumption and alcohol policies on youth risky sexual behaviors. Alcohol Taxation and Control. *AEA Papers and Proceedings*. May 2005. Pages 263-266. ▪ Grossman M, Markowitz S. I did what last night?! Adolescent risky sexual behaviors and substance use. *Eastern Economic Journal*. 2005; 31:383-405. ▪ Grossman M, Kaestner RT, Markowitz S. Get high and get stupid: the effect of alcohol and marijuana use on teen sexual behavior. *National Bureau of Economic Research, Working Paper 9216:* 2002.

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PUBH 851 – Advanced Methods in Epidemiology
3 Credits
Spring 2016

Time and location	Graduate Center Room C196.03, Wed. 6:30-8:30 PM
Instructor	Associate Professor, Heidi Jones, PhD MPH 212-396-7750 hjon@hunter.cuny.edu Email is preferred method for correspondence
Office hours	Monday from 4:00-6:00 PM in Silberman Room 426 or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	A seminar course that provides an in-depth understanding of advanced epidemiological techniques for data analysis and promotes lifelong learning via student-led applications and discussions of these methods
Course prerequisites	PUBH 822 Epi Methods III & PUBH 825 Applied Bios II
Course format	I This is a seminar course with student-led group discussions combined with computer applications during lab sessions and as assignments. All materials are posted on Blackboard.
Required reading and resources	There is no required textbook. Weekly readings are available on Blackboard
Suggested reading and resources	Optional additional readings will also be posted on Blackboard.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Demonstrate mastery of causal inference and apply these techniques to scientific questions relevant to at least two current public health issues or population groups that are relevant to the student's substantive content interests.	• Describe the strengths and limitations to using propensity scores and inverse probability weights for treatment effects to adjust for confounding in observational studies • Describe the strengths and limitations to using inverse probability weights for censoring with use of multiple imputation to adjust for missing data in longitudinal observational studies	• Worksheets • Group discussion facilitation
.2 Identify and apply appropriate biostatistical approaches to analyses that address epidemiological questions in public health research and practice	• Run and interpret propensity score models with stratification and matching in SAS • Run and interpret IPW for treatment effect models in SAS • Run and interpret IPW to account for loss to follow up in SAS • Run and interpret multiple imputation to account for missing data in longitudinal studies	• Lab assignments
3. Teaching epidemiologic methods to students, more junior colleagues or to others in public health	• Facilitate group discussions of advanced epidemiological method papers • Present and explain SAS syntax and output for advanced epidemiological methods	• Group discussion facilitation • Analysis presentation

Course Assessments

Your understanding of the course material will be evaluated through 4 homework assignments using SAS statistical software, 7 worksheets based on the readings, group discussion facilitation, presentation of final analysis and class participation

Grading

Evaluation criteria

Homeworks: there will be 4 homework assignments based on the SAS labs in which students will be asked to apply the statistical techniques used in the lab to data, and interpret the results on their own. Each homework will be graded out of 25, based on the extent to which the results and interpretation are correct.

Worsheets: there will be 7 worksheets with guiding questions to focus students' reading of the weekly materials. Worksheets will be scored from 1-3, with 1 showing minimal effort, questions not fully answers, and/or lack of understanding of the material, 2 showing solid effort, with some questions not fully answered and 3 showing high level of effort, questions fully answered, and high level of comprehension.

Group facilitation: Articles will be assigned to facilitators for weekly article discussion. Facilitaors will be scored from 1-3, with 1 showing minimal preparation and/or inability to guide discussions effectively, 2 showing solid preparation and strong discussion, with some diversions, 3 showing high levels of preparation, and clear guidance to keep discussions focused on content area.

Final project: For the final project, students will select a dataset of their choice and apply one or two methodological techniques covered in class to explore a research question. They will present the results from the final analysis during class, and will prepare a 5-6 page paper describing the methods and interpreting the results. Additional information on the final project, including the grading rubrics will be posted on Blackboard.

The relative weight of each course component is as follows:

Assessment	Weight
Homeworks	30%
Worksheets	30%
Group facilitations	10%
Final presentation	15%
Final project/paper	15%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Class will begin promptly to maximize our time together. Please arrive to class on time, and be prepared to contribute to class discussion. Participation and in-class attendance are worth 5% of your grade.

Late/incomplete submission of assignments

Worksheets are due electronically at 6 PM prior to the beginning of class. No late assignments for worksheets will be accepted. SAS exercises are due electronically at 6 PM prior to the beginning of class. Late assignments will receive 4 points (out of 100) deducted for every day late and NO assignments will be accepted more than 3 days late (i.e. later than 6 PM on Saturday).

Make-ups, rewrites, and extra credit
There will not be any opportunities for extra credit or rewrites.

Expectations of students
Attend seminars, read articles prior to class, participate during class discussions, seek help/ask questions early and often, provide the instructor with constructive feedback on course material and content and, have fun with the material,

Expectations for the instructor
I will respond to emails within 24-48 hours, excluding weekends. I will tailor the class to your needs and interests depending on the feedback I receive. Generally, I will return graded homework assignments within two weeks (will return them within one week, when possible)

"Green" policies
In an attempt to save paper, homework assignments will be submitted electronically and will be returned electronically, with comments in track changes. Suggestions for other adjustments to the course to reduce environmental impact are always welcome.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity
CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

	Date	Topic	Readings and Assignments
1	02/03/16	Review confounding, selection bias, measurement error and DAGS	Come to class with suggestions for additional topics to consider in this class
2	02/10/16	Propensity scores and IPW for treatment	• Austin. 2011. An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behavioral Research*. 46:399-424. • Crowson et al. 2013. The basics of propensity scoring and marginal structural models. Technical report #84, Mayo Clinic. • Hernán and Robins. Causal Inference. Chapter 2 Randomized Experiments. • Rubin. 2007. The design versus the analysis of observational studies for causal effects: Parallels with the design of randomized trials. *Statistics in Medicine.* 26:20-36. • Three letters – Shrier, Rubin and Pearl in response to the above Rubin 2007 article. • Dean et al. 2015. Can you party your way to better health? A propensity score analysis of block parties and health. *Social Science & Medicine.* 138:201-9. **Worksheet 1 due**
3	02/17/16	Lab 1: Propensity score stratification and matching in SAS	• Parsons. Using SAS software to Perform a Case-Control Match on Propensity Score in an Observational Study. • Yanovitzky et al. Estimating causal effects of public health education campaigns using propensity score methodology. 2005. *Evaluation and Program Planning*. 28:209-220. • Hernán and Robins. Causal Inference. Chapter 3 Observational studies.
4	02/24/16	***Please note we are meeting in the conference room in 3317 for discussion***	• Cepeda et al. 2003. Comparison of logistic regression versus propensity score when the number of events is low and there are multiple confounders. *American Journal of Epidemiology*. 158:280-7. • Zule & Bobashev. 2009. High dead-space syringes and the risk of HIV and HCV infection among injecting drug users. *Drug and Alcohol Dependence*. 100:204-13. • Kurth et al. 2005. Results of multivariable logistic regression, propensity matching, propensity adjustment, and propensity-based weighting under conditions of nonuniform effect. *American Journal of Epidemiology*. 163:262-70. • Stuart. 2010. Matching methods for causal inference: a review and a look forward. *Statistical Science*. 25:doi.10/1214/90-STS313.

	Date	Topic	Readings and Assignments
			• Glynn et al. 2006. Indications for propensity scores and review of their use in pharmacoepidemiology. *Basic Clin Pharmacol Toxicol*. 98:253-9. • Vaughan et al. 2015. An application of propensity score weighting to quantify the causal effect of rectal sexually transmitted infections on incident HIV among men who have sex with men. BMC Medical Research Methodology.15:doi.10/1186/s12874-015-0018-y. **4 facilitators for assigned article(s) posted on Bb (30 minutes per facilitator)** **Worksheet 2 due**
5	03/02/16	Lab 2: Propensity scores and creation of IPW for treatment (chapter 12 SAS code Hernan text)	• Hernán and Robins. Causal Inference. Chapter 11 Why Model? & Chapter 12 IP Weighting and Marginal Structural Models **Homework 1 due**
6	03/09/16	IPW vs. multiple imputation for longitudinal studies with missing data	• Weitz et al. 2013. Safety of aspiration abortion performed by nurse practitioners, certified nurse midwives, and physician assistants under a California legal waiver. *Am J Pub H.* • Sterne et al. 2009. Multiple imputation for missing data in epidemiological and clinical research: potential and pitfalls. *BMJ.* 338:b2392. • Pearl and Mohan. 2014. Recoverability and testability of missing data: introduction and summary of results • Mohan and Pearl. 2015. Graphical models for recovering probabilistic and causal queries from missing data. • *Additional readings TBD.* **Assigned facilitators** **Worksheet 3 due**
7	03/16/16	Lab 3: IPW vs. multiple imputation for loss to follow up	• Readings TBD **Homework 2 due**
	03/23/16	No Class – Friday Schedule	
8	03/30/16	Marginal Structural Models vs. Structural nested models (g-estimation)	• Hernán and Robins. Causal Inference, chapter 13 Standardization and the parametric g-formula & G-estimation of structural nested models • Additional reading TBD **Assigned facilitators** **Worsheet 4**

	Date	Topic	Readings and Assignments
9	04/06/16	Doubly robust estimation	• Readings TBD **Assigned facilitators** **Worsheet 5**
10	04/13/16	Lab 4: Doubly robust estimation	• Readings TBD **Homework 3 due**
11	04/20/16	Transportability	• Readings TBD **Assigned facilitators** **Worsheet 6**
	04/27/16	No class - spring break	
12	05/04/16	Non-linear associations – splines and transformations	• Readings TBD **Assigned facilitators** **Worsheet 7**
13	05/11/16	Lab 5: Non-linear associations	• Readings TBD
14	05/18/16	Competing risks in survival analysis	• Readings TBD **Homework 4 due**
15	05/25/16	Final presentations	Final presentations

Please note, while the overall content of this course will be covered as outlined, the syllabus may change based on the need to adapt to student interests, feedback and expertise. Always check the Blackboard site for the most up-to-date information on course readings and assignments.

CUNY SCHOOL OF PUBLIC HEALTH

NUTR 702 - Pre-Professional Practice in Dietetics: Food Service
3 Credits **Spring 2016**

Time and Location	As arranged with preceptor, hours as arranged by preceptor and Internship Director
Instructor	Internship Director, Ann Gaba EdD, RD, CDN, CDE
Email	agaba@hunter.cuny.edu
Phone	Office: (212)-396-7773 Cell (interns ONLY): (646)-578-5886
Office	Silberman 611
Office hours	Walk-in: Wednesday 4:30 – 6:00 pm, or by appointment
Course website	https://bbhosted.cuny.edu
Course description	Supervised externship in food service and personnel management *Open to dietetic internship (DI) students only.*
Course Prerequisites	Complete all required coursed for a Didactic Program in Dietetics (DPD) and match to the Internship through the Dietetic Internship Centralized Application System and DnD Digital.
Course Format	In this supervised practice experience, interns are placed with preceptors in food service management practice sites. This fieldwork is supported by on-line reference materials and assignments via Blackboard.
Required books	none
Recommended books	Introduction to Foodservice,(formerly West and Wood) June Payne-Palacio and Monica Theis, Pearson/ Prentice Hall. ISBN 0135008204
Reserve material	See list posted on Blackboard Page
Other required materials	See web links on Blackboard Page

Assignments: Food Service Module, Food Service/ Food Science Conference Report

Class attendance/participation: Intern schedules are arranged individually with each preceptor. All interns are expected to arrive at their rotation sites at the agreed upon times. Interns are expected to notify the Internship Director and their preceptor of a need for any changes to the schedule in advance.

Supplemental Reading Materials: will be posted on Blackboard, or handed out in class. Any changes will be posted in Announcements.

Reference Manuals – refer to the **Dietetic Internship Policy and Procedure Manual** and the **Intern Handbook** for further details of policies and procedures.

Grading

10 %	Professional Meeting Report Food Service / Food Science Topic
20%	Food Service Module
20%	Rotation Journals / E-portfolio
50%	Preceptor Projects / Evaluation
100%	

MPH Program Competencies:

MPH Program Competencies for all MPH students	Course Learning Objectives
. Apply the core functions of PH practices (assessment, policy development, and assurance) to the analysis of urban PH problems and their solutions.	Demonstrate through the intern log and chart review assignments the application of assessment, assurance and/or policy development during the fieldwork experience.
. Apply the core PH values and techniques (e.g., science-based, population-focused, community-oriented, prevention-motivated approach, rooted in social justice).	Demonstrate through the intern log and chart review assignments the application of one or more core PH values or techniques through the fieldwork experience
. Apply ethical principles and standards when conducting PH activities (e.g. use of information technology; assessment and research; program development, implementation and evaluation; and policy development and analysis).	Apply ethnical principles to fieldwork placement, (e.g. human subjects' protection principles to the data collection). Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards Practice in accordance with American Dietetic Association Code of Ethics.
. Apply principles of effective communication in presenting PH information in various media and formats to professional and lay audiences	Prepare written and oral progress and evaluation reports (e.g. intern logs, conference review papers, service improvement projects), using appropriate professional formats.
1. Collaboratively engage with diverse communities, sectors and/or constituencies (e.g. researchers, practitioners, community organizations)	Identify different stakeholders and evaluate their roles on the fieldwork project. Collaborate with one or more preceptors in

to achieve PH goals.	carrying out and evaluating a service improvement project.
4. Use key planning constructs (e.g. values, vision, mission, goals, objectives and outcomes) in planning, implementing and evaluating PH programs	Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project

Institutional policies

Academic honesty: Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. For more information visit: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-academic-integrity. The complete text of the CUNY Academic Integrity can be found at this site: http://www.cuny.edu/about/administration/offices/la/Academic_Integrity_Policy.pdf/

Services for disabled students: "In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. It is recommended that all students with documented disabilities (emotional, medical, physical, and/or learning) consult the Office of AccessABILITY to secure necessary academic accommodations. For further information and assistance, please call: (212) 772- 4857 or (212) 650-3230 or visit http://www.hunter.cuny.edu /studentservices/access

Help with research and writing: Feedback will be given on the quality of all written assignments. If you require further assistance with improving your writing skills, consider visiting the Student Reading and Writing Center at the 68th Street campus. For more, information visit http://rwc.hunter.cuny.edu/

Last day to drop the course with the grade of "W" is Nov 6, 2014. Hunter has three types of grades of withdrawal: W, WA, and WU. There may be serious academic and financial consequences associated with course withdrawal. Discuss your situation with an Advisor

in the Office of Student Services, 1119 East Building, (212) 772-4882. For more information visit: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-course-withdrawal

Incomplete grade policy: Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an INCOMPLETE is at the discretion of the instructor. Only students averaging C or above in a course are eligible to request an incomplete course grade. According to Hunter regulations, there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, a contract stating the terms and deadlines for submission of pending assignments will be signed by both the student and the instructor. The student with an INC grade will not be permitted to register for classes in the upcoming semester unless this contract is on file in the SUPH office and the instructor advises the Program Director when the incomplete has been resolved.

Grade appeals: When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. Please consult with the instructor within the first 3 weeks of the following semester. If the student is still not satisfied, he/she should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. Students have the right to request in writing that the SHS Director of the Hunter College campus appoint a student as a member to the Grade Appeals Committee. This appeal at the campus level must be submitted within the first 5 weeks of the semester following the receipt of the grade. For further guidance, please refer to the "College-wide Grade Appeals Procedures" adopted by the Senate in fall 1985. Copies of this procedure may be obtained in the Senate Office, the Office of Student Services, or departmental offices. For more information, visit: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-academic-appeals

CUNY SCHOOL OF PUBLIC HEALTH

NUTR 703 - Pre-Professional Practice in Dietetics: Community
3 Credits **Spring 2016**

Time and Location	As arranged with preceptor, hours as arranged by preceptor and Internship Director
Instructor	Internship Director, Ann Gaba EdD, RD, CDN, CDE
Email	agaba@hunter.cuny.edu
Phone	Office: (212)-396-7773 Cell (interns ONLY): (646)-578-5886
Office	Silberman 611
Office hours	Walk-in: Wednesday 4:30 – 6:00 pm, or by appointment
Course website	https://bbhosted.cuny.edu
Course description	Supervised externship in community nutrition practice *Open to dietetic internship (DI) students only.*
Course Prerequisites	Complete all required coursed for a Didactic Program in Dietetics (DPD) and match to the Internship through the Dietetic Internship Centralized Application System and DnD Digital.
Course Format	In this supervised practice experience, interns are placed with preceptors in community nutrition practice sites. This fieldwork is supported by on-line reference materials and assignments via Blackboard.
Required books	none
Recommended books	The Atlas of Food – Who Eats What, Where, and Why, Erik Millstone and Time Lang, University of California Press, 2008.
Reserve material	See list posted on Blackboard Page
Other required materials	See web links on Blackboard Page

Assignments: Intern Journal/Log, Restaurant Review, WICWORKS on-line training modules, Community/ Public Health conference report, "Step by Step" on-line counseling training

Class attendance/participation: Intern schedules are arranged individually with each preceptor. All interns are expected to arrive at their rotation sites at the agreed upon times. Interns are expected to notify the Internship Director and their preceptor of a need for any changes to the schedule in advance.

Supplemental Reading Materials: will be posted on Blackboard, or handed out in class. Any changes will be posted in Announcements.

Reference Manuals – refer to the **Dietetic Internship Policy and Procedure Manual** and the **Intern Handbook** for further details of policies and procedures.

Grading

10 %	Professional Meeting Report Community / Public Health Topic
30%	On-line training
30%	Preceptor Evaluations
10%	Restaurant Review
20%	Rotation Journals / E-portfolio
100%	

MPH Program Competencies:

MPH Program Competencies for all MPH students	Course Learning Objectives
. Apply the core functions of PH practices (assessment, policy development, and assurance) to the analysis of urban PH problems and their solutions.	Demonstrate through the intern log and chart review assignments the application of assessment, assurance and/or policy development during the fieldwork experience.
. Apply the core PH values and techniques (e.g., science-based, population-focused, community-oriented, prevention-motivated approach, rooted in social justice).	Demonstrate through the intern log and chart review assignments the application of one or more core PH values or techniques through the fieldwork experience
. Apply ethical principles and standards when conducting PH activities (e.g. use of information technology; assessment and research; program development, implementation and evaluation; and policy development and analysis).	Apply ethnical principles to fieldwork placement, (e.g. human subjects' protection principles to the data collection). Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards Practice in accordance with American Dietetic Association Code of Ethics.
. Apply principles of effective communication in presenting PH information in various media and formats to professional and lay audiences	Prepare written and oral progress and evaluation reports (e.g. intern logs, conference review papers, service improvement projects), using appropriate professional formats.
1. Collaboratively engage with diverse communities, sectors and/or constituencies (e.g. researchers, practitioners, community organizations) to achieve PH goals.	Identify different stakeholders and evaluate their roles on the fieldwork project. Collaborate with one or more preceptors in carrying out and evaluating a service improvement

	project.
4. Use key planning constructs (e.g. values, vision, mission, goals, objectives and outcomes) in planning, implementing and evaluating PH programs	Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project

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Last Updated January 11, 2016

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

NUTR 710: Principles of Public Health Nutrition

3 Credits
Spring 2016

Time and location	Silberman Building Room TBD Tuesdays, 6:05 to 7:50 pm
Instructor	Assistant Professor May May Leung, PhD, RD mm.leung@hunter.cuny.edu (best way to reach me) 212.396.7774
Office hours	Tuesdays, 3:45 to 5:45 pm or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Fundamentals of nutrition in public health as they apply to health promotion and disease prevention for individuals and society, with emphasis on urban populations.
Course prerequisites	N/A
Course format	Hybrid (lecture and online)
Required reading and resources	Edelstein S. Nutrition in Public Health: A Handbook for Developing Programs and Services (3rd edition). Sudbury (MA): Jones & Bartlett Learning; 2011.
Suggested reading and resources	Spark A. Nutrition in Public Health: Principles, Policies and Practice (2nd edition). Boca Raton (FL): CRC Press; 2015.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Apply research methodology, interpretation of research literature and integration of research principles into evidence-based practice for public health nutrition	• Locate and synthesize empirical evidence related to public health nutrition • Identify evidence-based health promotion strategies appropriate for a target population • Develop an evidence-informed public health nutrition initiative for a target population	• Discussion • Logic Model • RE-AIM Evaluation • Food Policy Debate • Grant Proposal: Letter of Intent • Grant Proposal: Paper • Grant Proposal: Presentation
2. Identify and prioritize nutritional problems for individuals at various stages of the life cycle and for diverse population groups using appropriate assessment methodologies.	• Locate and synthesize empirical evidence related to public health nutrition issues for diverse populations at different stages of the life cycle • Identify different nutrition and anthropometric assessment methodologies appropriate for public health nutrition issues	• Discussion • RE-AIM Evaluation • Food Policy Debate • Grant Proposal: Letter of Intent • Grant Proposal Paper • Grant Proposal Presentation
3. Use social and behavioral theories to inform public health and nutrition research and practice	• Apply social and behavioral theories in the design, development and evaluation of public health nutrition-related initiatives	• Grant Proposal: Paper • Grant Proposal: Presentation
4. Discuss the role of government and organizational systems and policies that influence accessibility, adequacy and safety of the food supply system (production, processing, distribution, consumption), and the relationship of food, nutrition and lifestyle choices in health promotion and disease prevention	• Identify factors that link the food supply system with the political, social, economic and health status of communities. • Identify federal, regional and local organizations that play roles in public health and nutrition promotion and advocacy. • Identify government policies at the federal, state and local levels that influence health and lifestyle choices of the population.	• Discussion • Logic Model • Food Policy Debate

5. Demonstrate effective oral and written communication and advocacy skills for public health nutrition	• Identify effective methods of translating evidence-based information for public health nutrition education and advocacy • Identify effective methods of communicating evidence-based nutrition information to different populations	• Discussion • Food Policy Debate • Grant Proposal: Letter of Intent • Grant Proposal: Paper • Grant Proposal: Presentation
6. Contribute to the planning, implementation or evaluation of community nutrition interventions as a member of an interdisciplinary team	• Design a public health nutrition initiative for a vulnerable population. • Develop outcome measures to evaluate the potential impact of a public health nutrition-related initiative.	• Logic Model • RE-AIM Evaluation • Goals and Objectives • Grant Proposal: Letter of Intent • Grant Proposal: Paper • Grant Proposal: Presentation

Course Assessments

Your understanding of the course material will be evaluated through multiple assignments, a grant proposal paper and presentation, a group policy debate, and class discussion/participation. Below is a brief description of the course assessments. Details about the assignments and grading criteria will be available on the course website.

Logic Model (40 points):
Develop a logic model for a nutrition and/or physical activity policy related to obesity and/or food security. Note what the policy is and also whether it is a city, state or federal level policy.

Goals and Objectives (40 points):
The prevalence of type 2 diabetes in adults in the South Bronx is higher than the national average. You are an RD/nutritionist at the NYC Department of Health who has been assigned the responsibility of addressing this problem.
Write 2 outcome objective for South Bronx adults related to the following behaviors:

a. reducing intake of sugary drinks (e.g., sodas)
b. increasing physical activity behavior

Write a process objective for each of the outcome objectives you wrote for Question #2. Be sure that your process objective is related to your outcome objective.

RE-AIM Evaluation (40 points):
Choose a federal, regional or local public health nutrition policy/program in which you're interested.

Using the RE-AIM framework and the Center-TRT website (www.center-trt.org), evaluate the policy/program's potential for public health impact by assessing each component of the RE-AIM framework.

Public Health Nutrition Career Goals (10 points):

- Update your resume and <u>bring it to class</u>.

- <u>Print out</u> two job descriptions/openings in the field of public health/community nutrition. Review the job descriptions and highlight parts of the job that you believe match your strengths. Highlight parts of the job description that you believe you need to improve upon to be a stronger candidate for the positions.

- Answer the following questions.
  - How do you define 'success'?
  - What are your career goals?
  - What do you want to accomplish in the next year that will help you reach your career goals?
  - State one next step that you will do to strengthen your potential candidacy for one of the positions you researched.

Food Policy Debate (60 points):
Classroom debates are exercises designed to allow you to strengthen your skills in the areas of leadership, interpersonal influence, teambuilding, group problem solving, and oral presentation. Debate topics and position statements are outlined below. You will be randomly assigned to your topic and position (e.g., Pro or Con). All group members are expected to participate in the research, development, and presentation of your debate position. Each participating member will receive the same group grade.

Grant Proposal: Letter of Intent (10 points)
Submit a letter of intent for approval before submitting a full proposal.
A letter of intent (LOI) informs the funding agency of your intent to apply for grant funds. The LOI can be used to 1) Screen out potential applicants/projects that are not of interest to the funding agency. 2) Help the funding agency plan for the grant review process.

Grant Proposal: Paper and Presentation (160 points): In a paper and presentation, you will develop a grant proposal for a 2-year public health initiative for your selected community population targeting one or more of the following outcomes:

1) Increasing healthy eating
2) Increasing physical activity
3) Increasing breastfeeding initiation, exclusivity, and/or duration

Your grant proposal should include the following information:

- Abstract
- Background and Significance
- Description of proposed project
- Potential public health impact of proposed project using the RE-AIM framework
- Goals and Objectives
- Evaluation Plan
- Budget and Budget Justification
- Logic Model
- References

All assignments (except for the Career Goals assignment) will be submitted via Blackboard. An “Assignments” folder is located within the Course Materials section of Blackboard. Within the “Assignments” folder, each assignment will have a corresponding folder, which includes the full description of the assignment (as they are issued) and a location where you can submit your assignment.

Attendance and Class Participation (40 points):
Significant participation is expected during each class. Discussion forums, in-class discussion, interactive communication and the attitude you display towards others will be a part of your final grade.

Grading

Evaluation criteria

All assignments will be assessed based upon a rubric. Specific information about grading criteria and rubric will be distributed with the assignment.

The relative weight of each course component is as follows:

	Points	Weight
Logic Model	40	10%
Goals and Objectives	40	10%
RE-AIM Evaluation	40	10%
Career Goals	10	2.5%
Policy Debate	60	15%
Grant Proposal		
-Letter of Intent	10	2.5%
-Paper	120	30%
-Presentation	40	10%
Attendance & Class Participation	40	10%
	400	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty

generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Expect to actively contribute to the discussion in class and complete and submit all assignments by posted due dates. Missed assignments or lack of participation not only affect the individual student, but they also affect the class as a whole due to the high degree of interaction within the course. Interactive communication and the attitude you display towards others will also be a part of your final grade (as class participation). Expect to attend each class on time, thus frequent days of lateness will also be marked and deducted as part of your final grade.

Absences due to religious holidays/beliefs: Each student who is absent from class because of his/her religious beliefs will be given an equivalent opportunity to make up examination or assignment that s/he may have missed. No student will be penalized for absence due to religious beliefs, and alternative means will be sought for satisfying the academic requirements involved. Please inform the course instructor ahead of time (at least one week prior to a scheduled absence) so that alternative options can be scheduled accordingly.

Late/incomplete submission of assignments

Five (5) percentage points will be deducted for each day after the due date an assignment is submitted. NO ASSIGNMENT WILL BE ACCEPTED AFTER A WEEK FROM THE DUE DATE.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit allowed.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete and upload all assignments by their assigned due date onto Blackboard. NO hard copy or emailed versions of assignments will be accepted.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and may be posted on Blackboard.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.
- Turn off (or silence) all communication devices when entering the classroom.

Expectation for written assignments:

Students may work with their peers **for feedback and discussion** on assignments and the paper; however the final version of these assignments **must reflect independent work and be written in each student's own language**. When working on the assignments and paper, students need to follow these guidelines:

- Reference and identify all sources and quotations. If there is any doubt about proper procedures, students should consult the instructor.
- If another person's ideas are used or paraphrased acknowledge the source in a proper citation,
- If actual words or expressions of another person or source, including the Internet, are used, indicate such use by incorporation of quotation marks and a proper citation.
- Provide your own work, not someone else's. Examples of using someone else's work include: submitting essays or portions of essays written by other people as one's own; or collaborating with others on an assignment or examination without specific permission from the instructor to do so.
- Do not submit material prepared for one course to fulfill the requirements for this course.

Expectations for the instructors

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Grading and feedback on assignments within 2 weeks of the due date.
- Communication about grades and progress in the course will be given through the course website.
- Answer any specific questions related to assignments prior to submission. However, to ensure fairness and feasibility for the class, the instructor is NOT able to evaluate assignments prior to submission.
- The instructor will try to respond to emails within a 24-hour period during the standard Monday through Friday work week. Students should not wait until a Friday to send an email if a response is needed before the following Monday. The instructor may respond over the weekend, but it is not guaranteed. Responses that take more than a day during the work week may be due to special circumstances, such as the instructor is attending an out-of-town conference, the student's query is of a complex nature that requires consultation with others/obtaining additional information, etc.
- Grading and feedback on assignments within 2 weeks of the due date.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

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Last Updated January 11, 2016

Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session	Date	Topic	Assigned Readings & Assignments
1	Feb 2	Course Overview Introduction to Public Health Nutrition	
	Feb 9	**Friday schedule (No class)**	
2	Feb 16	Diet-related Chronic Diseases & Health Disparities in US Population Collective Impact and Systems Approach in Seeking Solutions	**Readings** Articles re: Diet-related Disparities in US populations
3	Feb 23	Library Session Guest lecturer: *Mason Brown*	
4	Mar 1	Nutrition Epidemiology Guest lecturer: *Beth Widen, PhD* Evidence-based Programs; Research Translation	**Readings** Articles re: Nutrition Epidemiology; Edelstein (Chap 1); Articles re: translational research
5	Mar 8	Community Needs Assessment Methods Grant Writing: Letter of Intent and Budgeting	**Readings** Articles re: Community Assessment Model; Boyle & Holben (Chap 20-Budget section); Spark (Chap 16)
6	Mar 15	Social and Behavioral Theories Grant Writing: Logic Models	**Readings** Articles re: *Logic Models* **Assignment Due** Grant Proposal: Letter of Intent
7	Mar 22	Grant Writing Skills: Abstract and Goals & Objectives	**Readings** Articles re: SMART Goals & Objectives; Evaluation Planning **Assignment Due** Logic Model
8	Mar 29	Evaluating programs and policies using RE-AIM	**Readings** Articles re: RE-AIM **Assignment Due**

			Goals & Objectives
9	Apr 5	Addressing Obesity & Hunger through Advocacy & Policies Guest lecturer: Kelly Moltzen, MPH, RD?	**Readings** Edelstein (Chaps 7 to 9); Articles re: Policies in Response to Childhood Obesity **Assignment Due** RE-AIM Evaluation
10	Apr 12	Food Policy Debates	**Readings** Debate articles
11	Apr 19	Careers in Public Health Nutrition Guest lecturer: *Diana Johnson, MA?*	**Assignment Due** PH Nutrition Career Goals
	Apr 26	**SPRING RECESS (No class)**	
12	May 3	Course Wrap up In-class Proposal Development time	
13	May 10	GRANT PROPOSAL PRESENTATIONS	
14	May 17	GRANT PROPOSAL PRESENTATIONS	
15	May 24		**Assignment** Grant Proposal due by 5 pm

Note:
February 18, 2016: Last day to drop without a grade of "W
April 11, 2016: Last day to withdraw from a class with a grade of "W"

Last Updated August 4, 2015

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS
Nutr 73300 Nutrition and Human Development
Hunter College
3 Credits
Spring 2016

Time and location	Wednesday, 6:05 – 7:50 pm Silberman (2180 3rd Ave), Room 217
Instructor	Laurie Tansman, MS, RD, CDN Adjunct Lecturer, CUNY School of Public Health 212-241-7797 laurie.tansman@mountsinai.org
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course will provide an understanding of nutrition in relation to growth and development throughout the life cycle. While the course will review the basics, it will build on your present knowledge and provide you with an advanced understanding of public health issues throughout the life cycle. Lastly, this course will address controversial issues in life cycle nutrition.
Course prerequisites	As per program director.
Course format	This course is taught in a classroom format. All materials will be made available on Blackboard with some also being distributed in the classroom.
Required reading and resources	There is no required text. Reading Lists will be provided of journal articles that are required and recommended. These lists will identify information available on websites that will also be required.
Suggested reading and resources	See Reading Lists.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
KRD 1.1: The curriculum must reflect the scientific basis of the dietetics profession and must include research methodology, interpretation of research literature and integration of research principles into evidenced-based practice.	Locate, interpret, evaluate and use professional literature to make ethical evidence-based practical decisions.	Discussion Journal Article Review
KRD 2.1: The curriculum must include opportunities to develop a variety of communication skills sufficient for entry into professional practice.	Demonstrate effective and professional oral and written communication with individuals, groups and the public.	Discussion Current Events Journal Article Review
KRD 3.2: The curriculum must include the role of environment, food, nutrition and lifestyle choices in health promotion and disease prevention.	Demonstrate an understanding of the components that impact on health promotion and disease prevention	Discussion Exams Journal Article Review How low can you go – limiting sodium intake
KRD 5.1: The food and food systems foundation of the dietetics profession must be evident in the curriculum. Course content must include the principles of food science and food systems, techniques of food preparation and application to the development, modification and evaluation of recipes, menus and food products acceptable to diverse groups.	Demonstrate an understanding of how following diet guidelines/diet restrictions can be delicious and enjoyable using appropriate food preparation techniques during the process of modifying recipes.	Discussion Exams How low can you go – limiting sodium intake.
KRD 5.2: The physical and biological science foundation of the dietetics profession must be evident in the curriculum. Course content must include organic chemistry,	Demonstrate an understanding of the science of nutrition.	Discussion Exams Journal Article Review

biochemistry, physiology, genetics, microbiology, pharmacology, statistics, nutrient metabolism, and nutrition across the lifespan.		
KRD 5.3: The behavioral and social science foundation of the dietetics profession must be evident in the curriculum. Course content must include concepts of human behavior and diversity, such as psychology, sociology or anthropology.	Have an understanding of how human behavior impacts on -reliability of nutrition data -compliance with diet guidelines for the risk reduction and therapy of chronic disease	Discussion Journal Article Review How low can you go – limiting sodium intake

Course Assignments:
There are three assignments for this course. All submitted reports should use 12 font. All assignments must be handed-in on the due date.

Assignment #1 – Current Events Presentation
Due as per student sign-up on February 3rd.
Select a nutrition-related newspaper article from the seven-day period prior to class. Prepare a five minute oral presentation about the article. No written report is required. Be sure to state where the article appeared as well as the date. It is required that you bring the newspaper article to class from the print edition version. *An online copy of the article is unacceptable for this assignment.*

Assignment #2 – Journal article review
Due as per student sign-up on February 3rd.
You will be required to give an oral review of one of the assigned readings for a class lecture. Your presentation should include 2 – 3 slides that will be incorporated into the PowerPoint for that class lecture and will need to be e-mailed to the instructor the Friday before that class lecture. The slides should summarize the salient points of the article.

Assignment #3 – How Low Can You Go – Limiting Sodium Intake
Due December 3rd.
You will follow a low sodium diet for one day that should not exceed 1,500 mg. The challenge is to try and get as low sodium as possible.*****
**Please see the instructor if you have a medical reason for which following a low sodium diet is contraindicated.*

You will submit a report that includes:
One page summary of the challenges encountered as well as diet adequacies and inadequacies. Include your thoughts about the enjoyment of what you consumed
A copy of the diet record for that day and that includes the time, food/beverage consumed and amount consumed.
A print out of the nutrient analysis of the diet record using SuperTracker found at www.choosemyplate.gov.

Grading

Current Events Presentation	5%
Journal article review	20%
Midterm	25%
How Low Can You Go	15%
Final	25%
Class Participation	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 – 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

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Course Policies

Attendance and class participation

Expect to actively contribute to the discussion and complete and submit all assignments by posted due dates. Missed assignments or lack of discussion and participation not only affect the individual student, but they also affect the class as a whole due to the

high degree of interaction within the course. Grades for interactive communication are based on a rubric that includes the number, tone, and content of your contributions and the attitude you display towards others.

Late/incomplete submission of assignments
Late or incomplete assignments are not accepted.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students
- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence. Course correspondence will also be via our preferred e-mail address.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor
- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours Monday through Friday.
- Grading and feedback on assignments within 1 week of the due date.
- Communication about grades and progress in the course will be given through the course website.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a

student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

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Course Schedule
This schedule may change as the semester progresses. Refer to the current academic calendar for important dates. On schedule below, JAR = Journal Article Review

Session	Date	Topic	Readings/Resources	Assessment
1	2/3	Course Overview Understanding Nutrition Research Review of Epidemiological Nutrition Studies	See Reading Lists	-Current Events -Discussion
2	2/10	Preconception Nutrition Nutrition During Pregnancy	See Reading Lists	-Current Events -Discussion
3	2/17	Complications of Pregnancy and Childbirth Lactation and Infant Feeding	See Reading Lists	-Current Events -Discussion -JAR
4	2/24	Normal Infant Nutrition Special Topics	See Reading Lists	-Current Events -Discussion -JAR
5	3/2	Nutrition for Toddlers Trough School-Aged Children Special Topics	See Reading Lists	-Current Events -Discussion -JAR
6	3/9	Childhood obesity Review for Mid-term	See Reading Lists	-Current Events -Discussion -JAR
7	3/16	Mid-term Exam Review		-Current Events -Discussion
8	3/30	Adolescent Nutrition Pediatric Diabetes Pediatric Eating Disorders	See Reading Lists	-Current Events -Discussion -JAR
9	4/6	Nutrition Strategies to Prevent and Treat Chronic Disease	See Reading Lists	-Current Events -Discussion -How Low Can You Go
10	4/13	Adult Nutrition Special Topics in Adults and Chronic Disease	See Reading Lists	-Current Events -Discussion -JAR

11	4/20	Obesity in Adulthood including the Older Adult – Part 1	See Reading Lists	-Current Events -Discussion -JAR
12	5/4	Obesity in Adulthood including the Older Adult – Part 2	See Reading Lists	-Current Events -Discussion -JAR
13	5/11	Nutrition and the Older Adult Special Topics	See Reading Lists	-Current Events -Discussion -JAR
14	5/18	Nutrition and Ethics at the End of Life: From Infancy to Older Adults Review for Final	See Reading Lists	-Current Events -Discussion -JAR
15	5/25	Final Exam Review		

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 73700: Supervised Fieldwork in Public Health
3 Credits
Spring 2016

Time and location	Mondays 8:00pm-9:45pm // XXXXX See **Schedule** below for details.	
Instructors	**Contact info**	**Office hours and location**
Barbara Berney (HPM)	bberneyh@gmail.com	By appointment
Heidi Jones (EPI/BIOS)	hjon@hunter.cuny.edu	By appointment
Karyn Faber (COMHE)	kf206@hunter.cuny.edu	By appointment
Frank Mirer (EOHS)	fmirer@hunter.cuny.edu	By appointment
Course website	https://bbhosted.cuny.edu	
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.	
Course description	Students carry out 180 hours of supervised field work that is intended to bridge academic preparation and public health practice. Knowledge and skills from the core MPH and specialization courses are applied in a public health agency, community organization, or other setting relevant to the student's academic background, specialization, and career goals. This is accomplished under the supervision and guidance of an experienced preceptor. Field-based hours are complemented by faculty group meetings and online didactic sessions. In addition to deliverables required by the preceptor, the student develops and several assignments, culminating in a reflection paper, a self-evaluation, a preceptor evaluation, and the Capstone proposal.	

Course prerequisites	Completion of 18 credits toward the master's degree, including at least 3 required core courses (biostatistics, epidemiology, and the course most relevant to your specialization) and at least 2 courses in student's specialization.
Course format	The course is provided in a hybrid format – didactic sessions are provided online, including confirmatory participation quizzes, and face-to-face sessions are held, primarily for group meetings with faculty advisors and peers. Please see Schedule below for details.
Required reading and resources	NA
Suggested reading and resources	**BOOK** • Brownson RC, Baker EA, Leet TL, Gillespie KN, True WR. Evidence-Based Public Health, 2nd edition, Oxford University Press, 2011. **ARTICLES** **(Sessions 1, 2)** • Baker, E.L., Jr. et al, *The Public Health Infrastructure and Our Nation's Health. Annual Review of Public Health*, 2005. **26**:p. 303-318. • Mays, Glen P. et al, *Public Health Delivery Systems-Evidence, Uncertainty, and Emerging Research Needs*. American Journal of Preventive Medicine, 2009. **36**(3), p. 256-265. • Mays, Glen P, D. Scutchfield, M.W. Bhandari, and S.A. Smith, *Understanding the Organization of Public Health Delivery Systems: An Empirical Typology*. The Milbank Quarterly, March 2010. **88**(1): p. 81-111. **(Sessions 3-5)** • Callahan, D. and B. Jennings, *Ethics and Public Health: Forging a strong relationship.* American Journal of Public health, 2002. **92**(2): p. 169-176. • Brownson, R.C., J.E. Fielding, and C.M. Maylahn, *Evidence-Based Public Health: A Fundamental Concept for Public Health Practice.* Annual Review of Public Health, 2009. **30**(1): p. 175-201. • Rychetnik, L., et al., *Criteria for evaluating evidence on public health interventions.* Journal of Epidemiology and Community Health, 2002. **56**(2): p. 119-127. **RESOURCES** **(Sessions 1-3, 6)**

	• **Searching the literature and managing references** http://libguides.library.hunter.cuny.edu/ph755/databases • **Writing a literature review** http://www.sportsci.org/jour/9901/wghreview.html **(Sessions 7, 8)** • **Writing a research paper** http://intqhc.oxfordjournals.org/content/16/3/191.full/ http://intqhc.oxfordjournals.org/content/16/3/191/T1.expansion.html http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html • **Resume tips** http://www.sph.unc.edu/student_affairs/revamp_your_resume_and_cv_3312_4585.html • **Interviewing tips** http://www.boston.com/jobs/bighelp2008/fall/common_interview_mistakes/?s_campaign=8315

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Demonstrate (e.g. through the portfolio) the application of assessment, assurance and/or policy development during the fieldwork experience.	• Identify and assemble in the e-portfolio the product(s) of fieldwork project that exemplify the application of core public health functions in your work
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Demonstrate through self-reflection activities the application of one or more core public health values or techniques through the fieldwork experience	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Adhere to ethical and social justice principles and standards	• Apply ethical principles to fieldwork placement, (e.g. human subjects' protection principles to the data collection). • Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards	• Establish an approved protocol through CUNY IRB for human subjects' protection in your fieldwork project • Complete and submit the Student's Evaluation of Fieldwork Project Form
Interpret and analyze public health literature and apply evidence-based research	• Explore and become familiar with the public health literature databases and resources for organizing citations and sources	• Submit a rapid literature scan on your fieldwork topic • Submit a literature review on your

		Capstone research question
Apply basic statistical and informatics techniques	• Review and identify appropriate quantitative methods and tools for measuring public health data	• OPTIONAL (Quantitative Studies Only). In your Capstone Proposal, describe the method(s) you've selected for measuring your data from the fieldwork project
Communicate public health information through oral, written, digital and visual presentation	• Prepare written and oral progress and evaluation reports (e.g. the fieldwork project), using appropriate professional formats.	• Submit via electronic forms two progress reports on the fieldwork placement project • Complete and submit the Student's Evaluation of Fieldwork Project Form
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Discuss the relationship between social, behavioral, biomedical, and environmental elements and health outcomes	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Design and evaluate interventions to prevent or control public health problems	• Develop and assess policies and activities that are responsive to public health problems	•
Collect, analyze and interpret public health data	• Apply data collection, analysis, and interpretation methods to public health data	• OPTIONAL (Quantitative Studies Only). In your Capstone Proposal, describe the method(s) you've selected for measuring your data from the

		fieldwork project
Engage and collaborate with diverse groups	• Identify different stakeholders and evaluate their roles on the fieldwork project.	• Complete and submit the Student's Evaluation of Fieldwork Project Form
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Discuss the legal aspects of the US public health system and its inter-sectoral relationships with other public systems.	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project	• Complete and submit a Gantt chart describing the timeline for the fieldwork project • Design and submit a logic model describing the process for the research conducted via the fieldwork project
Explain the context of public and private health-care systems in which health care and public health policy are made and healthcare is delivered	• Discuss how the agencies you worked with during your fieldwork experience deliver health-related services to the populations they serve.	• Submit a "Reflections" paper on the fieldwork project and your perspective on public health practice

Course Assessments

The Supervised Fieldwork course is designed to guide students through the development, implementation, and completion of a research or practicum project on some aspect of public health practice at an approved placement site. Course assignments reflect the progressive activities involved in conducting the project, including design, planning and management, and implementation. This course process is intended to support the student's progress in the fieldwork project and to generate the elements of a resulting Capstone proposal or template paper for the student's culminating experience in the degree program. During the fieldwork period, students are expected to complete and submit two progress reports, and a final "reflections" paper on the experience. Both students and preceptors are required to complete evaluations of the fieldwork project upon its completion.

Grading

Evaluation criteria

Assignments and their relative weight toward your final grade in the course are listed below. The evaluation rubric which will be used to establish the grade for each assignment is available on the course Blackboard website under the section entitled My Assignments, along with instructions for that assignment. Items prefaced with an asterisk (*) will not have an evaluation rubric, and will be graded simply as complete (full points) or missing/incomplete (no points).

The relative weight of each course component is as follows:

Assessment	Weight
Rapid literature scan	10%
*CITI certificate	5%
*IRB determination	5%
*Progress report #1	5%
Gantt chart	5%
Logic model	5%
*Progress report #2	5%
Literature review	15%
"Reflections" paper on fieldwork project	15%
Capstone proposal	20%
Online session quizzes	5%
Class participation	5%
*Student Evaluation of Fieldwork Project Form	%
*Preceptor Evaluation of Fieldwork Project Form	%
	100%

The final course grade will be determined using the performance assessment described above, and resulting in a Pass (70% or higher) or a Fail (less than 70%) grade.

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

While the program discourages students from taking Incompletes, under some circumstances, an Incomplete may be the only option for completing the Fieldwork Project.

A request for an Incomplete must be approved by the Faculty Advisor, and the incomplete grade must be resolved within the next two semesters.

Students with an Incomplete in this course, Fieldwork (PH 73700), are not eligible for enrollment into the Capstone course (PH 73800) until the Incomplete is resolved.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

Because this is a hybrid course, students are expected to participate both online and in face-to-face meetings in class. Online participation is limited to two didactic sessions, and will be assessed with mini-quizzes to be completed at the end of each module in the session. Face-to-face participation will be assessed by faculty-administered attendance at the six class meetings.

Late/incomplete submission of assignments

Late assignments will not be accepted except in extenuating circumstances, with written approval by the student's faculty advisor. Incomplete assignments will be graded as such, unless the student is granted the opportunity to submit a rewrite by the faculty advisor, with written approval.

Make-ups, rewrites, and extra credit

Make-ups and extra credit assignments are not available for this course. In extenuating circumstances, the faculty advisor may allow a rewrite (or resubmission) of an Incomplete assignment, and must agree to this arrangement with written approval.

Expectations of students

Students are expected to submit Assignments on time, to participate respectfully in class and on the course Blackboard website, and to communicate with their Faculty Advisor on progress and problems related to the Fieldwork Project, as soon as issues arise.

Expectations for the instructor

Faculty Advisors will grade Assignments and post results within seven days of submission. Faculty Advisors will respond to all emails from students within 72 hours of receipt, and will arrange face-to-face meetings with students as requested, and with Preceptors, as necessary.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Sessions 1, 2, 8 will be held as all-class meetings at the regularly-scheduled time and location.
Sessions 3, 5, 7 will be held as group meetings by track with your faculty advisor, at a time and location convenient to students and faculty in that group.
Sessions 4, 6 will be held online via the course Blackboard site, as noted.
This course schedule is subject to change.

For important dates, please refer to the current academic calendar.

Session # Mode Date	**Topic**	**Assignment** **(Please submit all Assignments via the Assignments section on the course Blackboard site, unless otherwise noted.)**
Session 1. **Face-to-face all-class meeting** February 1	Welcome and overview, Fieldwork connection to Capstone • Searching the literature: Initial Lit Scan • Developing a research question • Prepping IRB submission	By 2/1 • Bring fieldwork contract to class By 2/14 • Submit completed IRB information sheet
Session 2. **Face-to-face all-class meeting** February 8	Library session • Search tools • Reference management tools	**Meet in C Level at Silberman Room TBD**

Session # Mode Date	**Topic**	**Assignment** **(Please submit all Assignments via the Assignments section on the course Blackboard site, unless otherwise noted.)**
Session 3. **Face-to-face group meeting with faculty advisor** March 7 – March 10	Meet in track-specific groups • Discuss research question and literature review development	By 3/6 • A brief literature scan • First progress report
Session 4. **Online** March 14 – March 20	• Project Management using Gantt Charts or Timelines • Logic Models	
Session 5. **Face-to-face group meeting with faculty advisor** March 21	Meet in track-specific groups • Discuss project management planning, processes, and implementation • Discuss data collection plans and progress • Discuss template paper selection	By 3/20 • A project plan using a Gantt chart or similar timeline model • Project logic model (Please bring both documents to meeting)
Session 6. **Online** April 12 – April 17	• Quantitative Analysis – planning and preparation: data analysis and mini stats review • Qualitative Studies – planning and analysis • Capstone paper – planning and development	By 4/17 • Second Progress Report • Literature review

Session # Mode Date	**Topic**	**Assignment** **(Please submit all Assignments via the Assignments section on the course Blackboard site, unless otherwise noted.)**
Session 7. **Face-to-face group meeting with faculty advisor** May 2 – May 5	Meet in track-specific groups • Share and discuss template journal articles • Peer review and discuss each other's Capstone paper proposals	By 5/1, **submit to Discussion Group** • First draft of Capstone proposal • Journal article(s) you will use as template/model for your Capstone paper (Please bring both submissions to class)
Session 8. **Face-to-face all-class meeting** May 16	**All-class meeting** • Review Fieldwork to Capstone requirements • Track-specific group meetings to finalize Fieldwork to Capstone processes	By 5/22 • A completed **Student's Evaluation of Fieldwork Experience Form** • A completed **Field Placement Supervisor's Evaluation Form (emailed from Placement Supervisor to Fieldwork faculty)** • A 'Reflections' document on Fieldwork for Student Portfolio • Capstone Proposal
Optional. **Individual consultations** May 17 – May 26	Student Faculty Consultations	**Note: Students should verify that all Assignments have been delivered or scheduled for delivery with Fieldwork faculty.**

CUNY SCHOOL OF PUBLIC HEALTH

HUNTER COLLEGE

COURSE SYLLABUS
PH 73800: Capstone
Spring 2016

Time & Location Mondays 6:05pm – 7:50pm XXX

Instructors	Email Addresses	Office Hours & Location
Barbara Berney (HPM)	bberneyh@gmail.com	By appointment
Mary Schooling (EPI/BIOS)	mary.schooling@hunter.cuny.edu	By appointment
Daliah Heller (COMHE)	daliah.heller@sph.cuny.edu	By appointment
Franklin Mirer (EOHS)	fmirer@hunter.cuny.edu	By appointment
Ann Gaba (NUTR)	agaba@hunter.cuny.edu	By appointment

Course Bb site

Accessed via https://bbhosted.cuny.edu. User name and password are required.

Support resources

For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.

Course description

This course consists of a structured seminar aimed at allowing students to apply experiences gained during their graduate program and synthesize that knowledge and experience in the form of a major writing project. It is expected that students use a combination of synthesized evidence, theoretical models, and empirical research to answer a public health research question or practice problem using interdisciplinary perspectives.

Course prerequisites

Completion of at least 36 credits of coursework toward the Master of Public Health (MPH) or Master of Science degree, including at least one course in each of the 5 core areas of public health (biostatistics, epidemiology, social and behavioral sciences, public health policy and environmental health and safety); and at least 3 specialization courses.

Course format

This course is taught with a mix of online learning resources and in-class discussion. This is not a self-paced course; there are weekly deadlines for writing, discussion and revisions, and attendance at and participation in the final presentations of all capstone projects.

This course is designed for students writing Capstone Papers and for those with permission to write Master's Essays. The schedule of assignments and deadlines vary depending on the type of project. Students writing the Capstone Paper attend every class; students writing the Masters Essay may attend all classes, but they must attend classes with an asterisk (*) in the Course Schedule below.

Required reading and resources

NA

Suggested reading and resources

See readings starting on page 12

Core Competencies *This course will help you to:*	**Course Learning Objectives** *After successfully completing this course, you are expected to be able to:*	**Assessment methods** *Competencies and learning objectives will be assessed as part of the following course assignments:*

Apply the public health core functions of assessment, policy development and assurance	• Construct a testable research question or practice problem, which
	  ○ can feasibly be addressed within a specified time period
	  ○ is of public health relevance
	  ○ when addressed will fill a knowledge gap
		Session 1, 2

Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Place a research question or practice problem within a relevant conceptual framework and the broader public health context • Identify and apply relevant professional or scholarly methods to an investigation or practice problem, including use of a predefined protocol or research plan. • Plan the analysis, synthesis and write up of an investigation from inception to completion including scheduling of items on the critical path to completion	Session 1-8
Adhere to ethical and social justice principles and standards	• Analyze relevant ethical or social justice issues using widely recognized principles or standards. • Obtain IRB or IACCU approval or exemption if appropriate. • Conduct any public health investigations involving human subjects in accordance with OHRPP ethical performance standards, including maintenance of confidentiality and security.	Session 1
Interpret and analyze public health literature and apply evidence-based research	• Implement a structured search of the literature. • Summarize the literature to date, including quantitative associations and qualitative themes, on a specific topic taking into account levels of evidence	Session 1, 2

	• Identify weaknesses within existing literature, such as addressing the wrong question, lack of comparison groups, biases or limited generalizability	
Apply basic statistical and informatics techniques	• Generate summarized descriptive information from PH data, such as frequencies and cross-tabulations • Assess qualitative data according to accepted methods, such as componential analysis. • Identify the key findings of a study or practice experience. • Provide sources of information for all statements of fact in the draft through use of a citation manager • Present PH information in figures, tables and graphs, such that each figure/table/graph is interpretable, self-explanatory and can be read standalone	Session 2-4
Communicate public health information through oral, written, digital and visual presentation	• Identify the interests of different stakeholders in the findings • Make an oral or poster presentation conveying key findings to a defined audience contextualized within current knowledge and interests of stakeholders, as well as with due acknowledgement of strengths and weakness of findings. • Write a document a public health problem such as a research report, program evaluation, analytic paper or policy analysis, using language appropriate for a professional public health audience.	Session 8-11
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Identify and describe environmental, behavioral, interpersonal, social, economic, political or policy factors that affect the etiology, prevention or resolution of a selected public health problem	Session 1,2
Design and evaluate interventions to prevent or control public health problems	• Implement the analysis, synthesis and writing plan for the culminating writing experience according to a predefined plan • Discuss the implications of a study or evaluation to address the needs for future evaluation and research, or for the development and implementation of programs and policies.	Session 1-8
Collect, analyze and interpret public health data	• Synthesize findings within the context of existing knowledge with acknowledgement of the strengths, weaknesses of the findings and gaps in knowledge that remain, and the corresponding implications for interpretation • Identify issues with reliability and validity of findings and explain their likely implications. • Justify methods of measurement • Identify public health implications of an investigation	Session 4-7
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions.	• Generate logic models, theory of change diagrams, and Gantt Charts to implement and plan public health programs • Demonstrate program effectiveness through quantitative and qualitative measures	Session 1,2

Course Assessments

The major deliverables for the course are the (a) written capstone project and the (b) accompanying oral *or* poster presentation. The written and oral or poster presentation are evaluated by two and five faculty members, respectively. The rubrics for grading each component are available on the course Bb site.

Grading

Evaluation criteria
Grading rubrics for each course component will be available on Bb
The relative weight of each course component is as follows:

Course component	**Weight**
Capstone paper or master's essay, plus letter of response to reviewers	75%
Oral or poster presentation of capstone paper or master's essay	15%
Portfolio (required in order to earn a grade for the course)	5%
Attendance, Bb posts and participation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	**Quality Points**	**Percentage**
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. If an incomplete grade is granted, the student negotiates and prepares a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact Professor Khursheed Navder, the Hunter Campus Director, in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
Attendance is taken seriously and we do take attendance.

Late/incomplete submission of assignments
This course runs on a very tight, inflexible schedule. Late or incomplete assignments are seriously discouraged. Once a capstone student gets behind, it will be extraordinarily difficult to catch up and finish on time.

Rewrites, and extra credit
Rewrites are essential in this course! In fact, rewrites are an integral part of every serious writing endeavor. Extra credit is not available in this course.

Capstone handbook
The latest edition of the Capstone handbook is available on our course Bb site and at:
http://www.cuny.edu/site/sph/hunter-college/campus-resources/capstone.html

Statistical and IRB assistance
Jennifer Brite is available for statistical advice and help with SPSS software. Contact her by email to make an appointment. IRB assistance is available from your capstone faculty member.

Portfolio
Every MPH- and EOHS MS-degree student is required to prepare and maintain a professional portfolio. The portfolio describes relevant public health experiences and achievements during the course of the studies leading to the master's degree. The portfolio is submitted toward the end of the Capstone course and uploaded onto a WORDPRESS website. Information for this process will be provided during course meetings in the semester.

Expectations of the capstone faculty
- Provide regular announcements, reminders, and suggestions on the course website
- Respond to student email within 24 hours Monday through Friday.
- Provide feedback on assignments within 1 week of the due date.

Expectations of capstone students

- Arrive on time for class sessions and individual appointments, submit deliverables on time, participate in discussions.
- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Show respect to everyone in the course.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact your Capstone track faculty directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Skills the Capstone Faculty Expects of Capstone Students

Be able to prepare the following

- Written work that is free of plagiarism.
- Article summary
- Structured abstract
- Testable hypothesis
- Reference list using RefWorks, MS Word 2013, or other electronic citation software
- Annotated bibliography
- Literature review
- Policy brief (1 page)
- Editorial
- Research report
- Op-ed essay

Be able to do the following

- Critically analyze public health documents, including peer-reviewed articles, grey literature, books, newspaper and magazine articles, blogs, texts produced by for-profit organizations, etc.
- Present your views clearly to a range of audiences
- Present both sides of controversial issues
- Copy edit an essay, which involves correcting spelling, punctuation, and grammar. It also includes suggesting the appropriate use of headings and subheadings, and ensuring that the required citation style is used. The task of the copy editor is to make the written work clear, correct, concise, comprehensible, and consistent.
- Develop a testable hypothesis
- Interpret statistical analyses and explain findings in narrative form
- Calculate & interpret descriptive statistics
- Calculate & interpret rates and proportions
- Calculate & interpret chi square and t-tests
- Construct & interpret tables & graphs
- Analyze and present quantitative data

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

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CUNY academic calendar

Please refer to the academic calendar for important dates, such as holidays and the deadlines for dropping and withdrawing from a course. http://www.cuny.edu/academics/calendars/fall-2015.html

Course schedule and assignments

This class is designed for all Capstone Projects, both students writing Capstone Papers and for students writing Master's Essays. The schedule of assignments and deadlines vary depending on the type of project. Please review the tables on the next pages that clearly indicate when items are due depending on whether you have approval to work on a Master's Essay or Capstone Paper. Refer to the current academic calendar for important dates.

This course schedule is subject to change.

Capstone students write and submit their papers section-by-section over the course of the semester. The faculty member makes suggestions, and students make revisions as suggested. When indicated, also post the assignment on Bb. Capstone students are required to attend all class sessions.

#	Date	Topic	Assignment / Due-date **Please submit all Assignments to the Discussion Group for your Track on the course Blackboard site or as instructed by your Advisor.** **^Applies to all students, including those doing Master's Essays.**
1	2/1 Face-to-face	• Faculty introductions • Course overview • Outline, key sections of a paper • Oral presentation or poster? • Portfolio assignment	**By 2/3, please submit** • Capstone proposal (final from Fieldwork PH737 or revised) • Literature review, including citations (from Fieldwork PH737) • Provisional title for Capstone paper
2	2/8 – 2/14 Online	• Methods – Quantitative & Qualitative Approaches • Mini Stats Review and Data Analysis • Table Shells (planning results)	**By 2/7, please submit** • Template paper(s) (to use as a model for your Capstone paper) • Outline of Capstone paper (section headings and sub-headings) • Introduction section (including Background, Significance, Literature review, What's knowledge gap, Research question/Hypothesis) In Meeting #1 (week of 2/15), you'll receive comments and feedback from faculty
3	Week of 2/15	Meeting #1 w/capstone faculty member • Come prepared to discuss your plans and progress on the Methods / Process section	**By 2/27, please submit** • Introduction + **Methods / Process section** • **Shells / Descriptions for Tables, Graphs, Figures** By 3/7, you'll receive comments and feedback from faculty

#	Date	Topic	Assignment / Due-date **Please submit all Assignments to your Faculty Advisor via email and/or via the Assignments section on the course Blackboard site as instructed by your Advisor.** **^Applies to all students, including those doing Master's Essays.**
4	3/7 – 3/13 Online	• Results for Quantitative and Qualitative Analysis • Results for Project Papers	**By 3/13, please submit** • Introduction + Methods + **Results section** In Meeting #2 (week of 3/21), you'll receive comments and feedback from faculty
5	Week of 3/21	Meeting #2 w/capstone faculty member	**By 3/27, please submit** • First complete draft of Capstone paper: Introduction + Methods + Results + **Conclusion section** In Meeting #3 (week of 4/11), you'll receive comments and feedback from faculty
6	4/4 Face-to-face	• How to structure and prepare your PowerPoint presentation • How to structure and prepare your Poster Presentation • Finalizing the portfolio • Group exercise: "Writing a structured abstract"	**By 4/3, please read** assigned papers (to be posted on Blackboard) and prepare to write a structured abstract for each of them in class (see Group exercise)
7	Week of 4/11	Meeting #3 w/ capstone faculty member • Come prepared to select oral presentation or poster	**By 4/10, please submit** • Structured abstract (250 words) for your Capstone paper

#	Date	Topic	Assignment / Due-date **Please submit all Assignments to your Faculty Advisor via email and/or via the Assignments section on the course Blackboard site as instructed by your Advisor.** **^Applies to all students, including those doing Master's Essays.**
8	5/2 Face-to-face	• Student presentations (1)	**By 5/1, please submit** • Second draft of the complete Capstone paper, revised (this version will also be reviewed by a second faculty member) By 5/15, you'll receive comments and feedback from faculty
9	5/9 Face-to-face	• Student presentations (2)	**By 5/8, please submit** • Portfolio draft By 5/15, you'll receive comments and feedback from faculty
10	5/16 Face-to-face	• Student presentations (3)	
11	5/23 Face-to-face	• Student presentations (4)	**By 5/22, please submit** • Final Capstone paper • Final portfolio

NB: While the overall content of this course will be covered as outlined, the syllabus may change based on the need to adapt to student interests, feedback and expertise. Always check the Bb site for the most up-to-date information on course readings and assignments.

B.Master's essay students work with their first and second readers throughout the semester, and have assignments that must be turned in to the Capstone faculty member by the specified due date (see below). The schedule of submissions of paper drafts should be arranged with the first reader as early in the semester as possible.

Master's essay students must attend class sessions 2/1, 4/4, 5/2-5/23

Due date	**Assignment for master's essay students**
2/1	Advise your Capstone faculty advisor of your Master's essay title and your 1st & 2nd readers. Your Capstone faculty advisor may serve as one of your readers.
2/8	Email Master's essay proposal to your readers. Your Capstone faculty advisor and at least one other reader must approve the proposal.
4/11	Notify your Capstone faculty advisor of your decision to do a poster presentation or oral presentation.
5/2	Submit Master's essay complete, refined draft to your readers.
5/9	Submit Portfolio draft to Capstone faculty advisor
5/16	• Receive Master's essay draft critiqued from your readers • Receive Portfolio draft critiqued from Capstone faculty advisor
5/23	• Submit final Master's essay • Submit final Portfolio

References, resources, and readings

WRITING THE CAPSTONE PAPER

1. Practical advice

For practical advice, look into the writing center at any major college or university, for example:

- Purdue Online Writing Lab (OWL). http://owl.english.purdue.edu/
- Hunter College Writing Center. http://rwc.hunter.cuny.edu/

2. Style

Unless indicated otherwise, papers submitted in PH 738: Capstone Seminar follow the style of the *American Journal of Public Health* (*AJPH*). The *AJPH* style is the same as that of the American Medical Association (AMA).

- *AJPH's* instructions for authors. http://ajph.aphapublications.org/userimages/ContentEditor/1318438422261/Instructions_for_Authors.pdf
- AMA Style Stat! For Research Papers. A quick reference to using the AMA style in college research papers. http://www.docstyles.com/library/amastat.pdf

3. Organization of the capstone paper

It is customary to organize the capstone paper using the IMRAD format: *Introduction, Method, Results And Discussion.* The IMRAD structure is not an arbitrary organization, but a direct reflection of the process of scientific discovery. AMA Stat! presents these variations on the IMRAD theme, which are also acceptable:

- For reports of original data: Context, Objective, Design, Setting, Population, Intervention(s), Main Outcome Measure(s), and Results.
- For a systematic literature review: Context, Objective, Data Sources, Study Selection, Data Extraction, Results, and Conclusions.

Please see the AMA Stat! website for detailed descriptions:
http://writingcenter.missouristate.edu/assets/WritingCenter/amastat.pdf

4. The capstone paper in general

- How to write all sections of a research paper Rice Univ: http://www.ruf.rice.edu/~bioslabs/resources_home.html
- Writing a research article: advice to beginners. http://intqhc.oxfordjournals.org/content/16/3/191.full/
- How to write a paper. Bates College: http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html
- Writing research papers. Rice Univ: http://www.ruf.rice.edu/~bioslabs/tools/report/reportform.html
- Guide to writing a formal physics lab report [despite the title, this has relevance for all science writing]. Union College. http://www.union.edu/Resources/Academic/writing/Help/Faculty/Orzel/GuideToWritingLabReports.php
- Preparation of the research report /scientific paper . http://www.sagepub.com/bjohnsonstudy/notes/Ch20_Lecture.doc
- How to write your thesis. [This could be titled 'How to write your capstone paper.'] http://www.ldeo.columbia.edu/~martins/sen_sem/thesis_org.html#Conclusions

5, Key sections of the capstone paper

A. Structured abstract

- Importance of 180 words (PPT): http://www.jpgmonline.com/documents/author/24/4_Aggarwal_11.pdf
- The structured abstract: http://research.mlanet.org/structured_abstract.html
- Structured abstracts: http://www.nlm.nih.gov/bsd/policy/structured_abstracts.html

B. Introduction/Background

- UNC: http://writingcenter.unc.edu/handouts/introductions/
- How to write the background/introduction section (PPT).
- How to write a literature review.

http://www.sportsci.org/jour/9901/wghreview.html

- Sample research paper. Although this paper is in the APA style, this site is worth examining for the side notes and also to see how the background section segues into the methodology and results sections of the paper. http://thewritesource.com/apa/apa.pdf
- Synthesis writing. Drew Univ: http://www.users.drew.edu/sjamieso/Synthesis.pdf

C. Methods

- How to write the methods section of a research paper. http://cancer.dartmouth.edu/documents/pdf/methods_section.pdf
- Logic model
  Please refer to your PH 737 notes.
- Threats to validity
  --Campbell, D.T. & Stanley, J.(1963). *Experimental and Quasi-Experimental Designs for Research.* Boston: Houghton Mifflin.
  --Trochim, W. *Research Methods Knowledge Base.* http://www.socialresearchmethods.net/kb/intval.php and http://www.socialresearchmethods.net/kb/external.php

D. Results

- A strategy for writing up research results. http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWstrategy.html

E. Discussion

- How to write an effective discussion. http://www.rcjournal.com/contents/10.04/10.04.1238.pdf

F. Conclusions

- UNC: http://writingcenter.unc.edu/resources/handouts-demos/writing-the-paper/conclusions

G. Bibliography/Citations

Unless indicated otherwise, papers submitted in PH 738: Capstone Seminar follow the style of the *American Journal of Public Health* (*AJPH*). The *AJPH* style is the same as that of the American Medical Association (AMA).

- *AJPH's* instructions for authors. http://ajph.aphapublications.org/userimages/ContentEditor/1318438422261/Instructions_for_Authors.pdf
- AMA Style Stat! For Research Papers. A quick reference to using the AMA style in college research papers. http://www.docstyles.com/library/amastat.pdf
- Quick Citation Guide. Penn State: Penn State: http://www.libraries.psu.edu/content/psul/researchguides/citationstyles/CSE_citation.html#cse-citations

Annotated bibliographies.

- UNC: http://writingcenter.unc.edu/handouts/annotated-bibliographies/
- Univ Wisconsin:. http://writing.wisc.edu/Handbook/AnnotatedBibliography.html/
- Purdue: http://owl.english.purdue.edu/.

MPH AND MS PORTFOLIOS

- Hunter College Capstone Handbook http://www.cuny.edu/site/sph/hunter-college/campus-resources/PortfolioInstructions/Portfolio_5102011.pdf
- Univ of Florida (2009): http://mph.ufl.edu/students/on-campus-students/mph-portfolio/
- Medical College of Wisconsin (2011): http://www.mcw.edu/FileLibrary/Groups/MPHProgram/Student_Handbook.pdf (pp. 10-11)
- University of Missouri (n.d.): http://publichealth.missouri.edu/assets/StudentPortfolioGuidelines.pdf

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PH 75000: Fundamentals of Biostatistics
3 Credits
Spring 2016

Time and location	This is a hybrid course. Students can attend the class **either in-person or online**. In-class attendance is mandatory only for the first class meeting (2/1), exams (3/14 and 5/16) and poster presentation of the final project (5/23). **Lectures** for all sections will be held on Mondays 6.05-7.20PM in room 201 (Silberman building) and on the YouTube channel/Google Hangout (links will be posted on Blackboard). Lectures will be led by Dr. Katarzyna Wyka. **Lab session** will be held on Mondays 7.30-8.50PM in Room C05, Respective lab links will be posted on Blackboard. Labs will be led by Anthony Devito.
Instructor	• Katarzyna Wyka, PhD: kwyka@hunter.cuny.edu (response time 24-48 hours) • Anthony Devito, M.S. EOHS tonydevito@gmail.com (response time 24-48 hours) Note: Always include "PH750" in the subject line.

Office hours	• Katarzyna Wyka, PhD:
	  ○ Mondays 4.30-6PM (online via Google Hangout or in person room 537 (Silberman Building) or by appointment
	• Anthony Devito, M.S.EOHS
	  ○ Alternating days and times schedule will be published on BB announcements each week or by appointment

Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Application and interpretation of basic descriptive and inferential statistical methods for the analysis of public health and other health-related data. *prereq: No prerequisites required.*
Course prerequisites	Elementary statistics or calculus or equivalent.
Course format	This is a hybrid course. Students can attend the class **either in-person or online**. Class lectures and labs will be broadcasted live and class recordings will be posted on Blackboard. Class activities include short weekly quizzes, lab assignments, exams and a project. Questions about class material will be posted and answered using discussion boards on Blackboard. It is extremely important that students devote 5-10 hours for the class on a weekly basis to keep up with class activities and interactions.
Required reading and resources	None.

Suggested reading and resources	*OpenIntro Statistics: Third Edition*. CreateSpace Independent Publishing Platform. Diez, D. M., Barr, C. D., Cetinkaya-Rundel M. (2015). **ISBN-10:** 194345003X, **ISBN-13:** 978-1943450039 A digital version is available free at http://www.openintro.org/stat/textbook.php. A print version is available for $10.14 from amazon.com, linked to from the website above. We strongly suggest that you purchase student license for PASW(SPSS) to use the software at home. Information on obtaining it is on Blackboard. Note that almost all computers in the libraries and Public Computing Services (PCS) labs at the Silberman Building, Brookdale and at 68th Street have PASW(SPSS) software installed. In addition, the Hunter College library operates a laptop loan program: http://library.hunter.cuny.edu/services/laptoploan. Such laptops would also have PASW (SPSS) and Microsoft products installed.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Explain the role and importance of bio-statistical analysis in public health research • Design an appropriate statistical analysis for a given public health research design • Recognize ethical principles and legal standards that should be followed in the collection, management and analysis of statistical data on human and non-human subjects	• Quizzes, project, CITI training
Apply basic statistical and informatics techniques	• Perform statistical calculations using a statistical software package • Create graphics and visual representations of statistical data using a statistical software package • Apply appropriate statistical analysis techniques based on the size of the data	• PASW(SPSS)/Excel exercise, project
Communicate public health information through oral, written, digital and visual presentation	• Write the interpretation of results from statistical analysis • Create and present an oral presentation of statistical output	• Final project, project presentation
Collect, analyze and interpret public health data	• Identify continuous, discrete, nominal and ordinal data • Summarize these data types using ◦ Bar charts, box plots, histograms, scatter plots ◦ Measures of central tendency: mean, median, and mode of measures of spread: variance, interquartile range, range of frequency tables • Define and differentiate between precision and accuracy • Define and calculate marginal, joint and conditional probability • Use binomial distribution to calculate probabilities	• Quizzes, exams, project

	associated with binary data • Convert count data to rates and proportions • Estimate centrality and variance of a sampling distribution from the population distribution using the Central Limit Theorem • Construct and interpret confidence intervals for ◦ Population mean and population proportion ◦ Large and small samples (using z and t sampling distributions) • Identify how changes in sample size, confidence level and other parameters affect the width of a confidence interval • Define null and alternative hypotheses for one-sided and two-sided inference • Perform inference tests for proportions using the normal approximation, for mean of a single sample, difference in means of two samples, and difference in means of paired samples • Use Z and t tables for hypothesis tests and constructing confidence intervals • Estimate the power of a t test • Calculate odds ratios, relative risks, and risk difference • Perform Pearson Chi-Square Test of Independence for r x c frequency tables • Perform and interpret one-way Analysis of Variance • Correct for multiple comparisons • Define type I and II error, power, and sample size and the relationships between them • Perform and interpret correlation and linear regression analysis	

Course Assessments

Your understanding of the course material will be evaluated through quizzes, two open book/notes exams, a project, and class participation. For the best possible grade, you must demonstrate an understanding of covered concepts, as well as mastery of basic computer skills.

Class Quizzes: There are 13 online weekly class quizzes corresponding to class materials. All quizzes specific due dates (posted on BB) and answer keys will be posted 2 days after the deadline. You should post questions regarding quizzes in the Discussion Board (Q&A Forum). Check My Grades to view your grade and feedback.

Class Exams: There are two open book/notes non-cumulative exams. Class exams will be completed in-person via Blackboard. Graded exams will be returned to students within 7 days. Check My Grades to view your grade and feedback.

Project. Each student will chose a research topic and will prepare 1) a report that will be submitted via Blackboard and 2) a PowerPoint presentation that will presented on 5/23 (6PM – 8.50PM) in class. Project description and grading rubric is located in the Project tab on BB. Project sections will be submitted throughout the semester (refer to Class Schedule on page 10). Project-related questions should be posted in the Discussion Board. All students who want a passing grade must complete the group project. Check My Grades to view your grade and feedback.

Class Participation: You are expected to participate in in-person meetings and/or via the Discussion Board. We will use the Discussion Board to clarify concepts covered in the class and answer questions pertaining to class material, quizzes and project sections. Each student is expected to contribute to the class by posting at least 5 questions/answers throughout the semester. Grading rubric is provided in the Discussion Board. Unprofessional and disrespectful posts will be removed and penalized. Check My Grades to view your grade and feedback.

Grading

Evaluation criteria

All assignments will be evaluated based upon rubrics found on the course website.

The relative weight of each course component is as follows:

Assessment	Weight
Quizzes	25%
Exams	25%
Project	30%
Class participation	20%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

It is very important to keep connected and interact with class instructors and classmates throughout the semester. The majority of our communication will occur via Blackboard:

- Complete all weekly classwork in a timely manner
- Post class related questions on Discussion Board (Discussion Board > General Q&A)
- In you would like to discuss a private matter email us directly

Online communication netiquette: All students are expected to follow rules of common courtesy in all online communication:

- Use a descriptive subject line that reflects the content of your message (e.g. "interpretation of p-value, class 7"; "hw1 question 3"). Write in short paragraphs and sign

your message with your full name.
- Check the content of your message for grammatical and spelling errors. Do not write in UPPERCASE as this is often interpreted as shouting in text-based messages. You can use emotional symbols (e.g. :-)) to indicate the tone of your voice.

Late/incomplete submission of assignments
Late quizzes will be penalized by deducting 10% from the earned grade per day, with no credit after homework answer key is posted (end of Day 2 post due date). Late exams will not be accepted. Late projects will not be accepted.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students
This is not a self-paced course. Students are expected to:
- Check email and Blackboard announcements on **weekly** basis
- Access course materials on **weekly** basis
- Complete and submit **weekly** quizzes
- Participate in **weekly** discussion board
- Complete and submit other assignments **as required**
- Check My Grades to monitor progress and received feedback on **weekly** basis

Expectations for the instructor
- Provide regular announcements and reminders on the course website and via email
- Answer questions posted on Discussion Board within 24-48 hours
- Respond to student email within 24-48 hours Monday through Friday
- Grade and provide feedback on assignments within 1 week of the due date
- Communicate grades and progress through Blackboard (My Grades)

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity
Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Session number/Week	Date of class	Topic	Reading	Assignment
0 1/29-1/31	**none**	**Getting started**	Syllabus	• Read syllabus • Complete quiz 0 (Syllabus quiz) • Introduce yourself on Blackboard • Read Online Student Resources • Read information about CITI training
1 2/1-2/7	**2/1** in-class attendance mandatory	**Introduction** • Study designs & sampling • Types of data • Standardization (Age Adjustment)	PowerPoint 1 OpenS CH 1.1-1.5	• Submit week 1 quiz • Complete SPSS/Excel exercise • Respond to Student introductions on Blackboard • Sign up for Project
2 2/8-2/14	**2/8**	**Data Summarization** • Tabular and graphical methods for describing data • Measuring center and spread	PowerPoint 2 OpenS CH 1.6-1.8	• Submit week 2 quiz • Complete SPSS/Excel exercise • Work on project
3 2/22-2/28	**2/22** 2/18 - Last day to withdraw with a grade of "WD"	**The role of probability** • Conditional probability • Diagnostic testing	PowerPoint 3 OpenS CH 2	• Submit week 3 quiz • Complete SPSS/Excel exercise • Work on project
4 2/29-3/6	**2/29**	**Probability Distributions and applications** • The Normal distribution • The Binomial distribution	PowerPoint 4 OpenS CH 3	• Submit week 4 quiz • Complete SPSS/Excel exercise • Submit project: Section 1 & 2
5 3/14-3/20	**3/14** in-class attendance mandatory	**EXAM 1**		
6 3/7-3/13	**3/7**	**Sampling distributions** • Sampling distribution of the mean • Sampling distribution of a proportion	PowerPoint 6 OpenS CH 4.1&4.4	• Submit week 6 quiz • Complete SPSS/Excel exercise • Work on project
7	**3/14**	**Estimation of Confidence**	PowerPoint 7	• Submit week 7 quiz

3/14-3/20		**Intervals** • Confidence intervals for a population mean • Confidence intervals for a population proportion	OpenS CH 4.2 & 4.5	• Complete SPSS/Excel exercise • Work on project
8 3/21-3/27	**3/21**	**Hypothesis Testing** • Hypotheses & test procedures • One-sample tests for a population mean • One-sample tests a population proportion	PowerPoint 8 OpenS CH 4.3 & 5.1-5.2 & 6.1	• Submit week 8 quiz • Complete SPSS/Excel exercise • Work on project
9 3/28-4/3	**3/28**	**Hypothesis Testing** • Two-sample tests for a population mean • Two-sample tests for a population proportion	PowerPoint 9 OpenS CH 5.3-5.4 & 6.2	• Submit week 9 quiz • Complete SPSS/Excel exercise • Work on project
10 4/11-4/17	**4/11** 4/11 - Last day to withdraw with a grade of 'W'	**Hypothesis Testing** • Odds Ratio/relative risk • Pearson's Chi-square/Fisher exact test	PowerPoint 10 OpenS CH 6.4	• Submit week 10 quiz • Complete SPSS/Excel exercise • Work on project
11 4/18-4/24	**4/18**	**Hypothesis Testing** • One-way ANOVA	PowerPoint 11 OpenS CH 5.5	• Submit week 11 quiz • Complete SPSS/Excel exercise • Work on project
12 5/2-5/8	**5/2**	**Multivariable Regression** • Correlation • Linear regression	PowerPoint 14 OpenS CH 7 &8.1-8.3	• Submit week 12 quiz • Complete SPSS/Excel exercise • Work on project
13 5/9-5/15	**5/9**	**Multivariable Regression** • Logistic regression	PowerPoint 13 OpenS CH 8.4	• Submit week 13 quiz • Complete SPSS/Excel exercise • Submit project: Section 3 & 4
14 5/16-5/22	**5/16** in-class attendance mandatory	**EXAM 2**		
15 5/23 (6PM – 8.50PM)	**5/23** in-class attendance mandatory	**Final Project Presentations**		• Submit Completed Project (all sections) • Participate in poster presentations • Submit CITI training certificate to BB.

Note: OpenS=*OpenIntro Statistics* textbook

Last Updated: February 23, 2016

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

Hunter College
PH 75200: Fundamentals of Epidemiology
3 Credits
Spring 2016

Time and location	This is a hybrid course which means the course will be taught partially online and partially in person. In-person sessions will be held Thursdays from 6-8:50pm in the Silberman Bldg, Rm 220 (lecture) and Rm C09 (lab) Online sessions are not held live. Instead, they can be viewed on your own time via Adobe Connect. Please see additional details below. Also, consult the Course Schedule below for dates of online and in-person sessions.
Instructor	Rosann Costa, MA rc181@columbia.edu Phone: 212-305-9346 E-mail is the preferable method of contact for the instructor.
Office hour	Rosann Costa Silberman Rm C09 Thurs*, 9-10pm & by appointment *after in-person sessions only If possible, please provide the instructor with advance notice that you wish to attend office hours.
Course website	https://bbhosted.cuny.edu/
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Apply principles and methods of epidemiological analysis. Identify and interpret epidemiological data. Illustrate and investigate incidence, distribution, determinants, and control of disease.
Course prerequisites	N/A

Course format	▪ In-person sessions will typically begin with a lecture (approximately 1-2 hours), followed by a five minute break and then a practical hands-on SPSS exercise (approximately 1-1.5 hours). Any remaining time will be used for review and questions. ▪ Online sessions will involve viewing a recorded lecture/lab exercise via Adobe Connect from any location of your choosing on your own time. These sessions are NOT held live.
Required reading and resources	Gordis L. *Epidemiology*. 4th or 5th ed. Philadelphia, PA: Saunders Elsevier, 2009 or 2013. *(on reserve at the Silberman library)* Additional assigned articles will be posted on Blackboard. Required to subscribe by email to *Morbidity and Mortality Weekly Reports*, published by the CDC: http://www.cdc.gov/mmwr/ *(no fee)*
Suggested reading/ resources and hardware/software	Aschengrau A, Seage III GR. *Essentials of Epidemiology in Public Health*. 3rd ed. Sudbury, MA: Jones & Bartlett, 2014. Rothman K. *Epidemiology – An introduction.* New York, NY: Oxford University Press, 2002. *(Both of these texts are on reserve at the Silberman library)* SPSS will be used in class and will be required for parts of the three HW assignments. The Hunter College license covers only on-campus use. The SPSS software is available for student use in the library and in computer labs at multiple Hunter campuses. Students who wish to purchase a student copy of SPSS can do so at www.onthehub.com. *SPSS Statistics Base GradPack 23* for 6 months for Mac or Windows for approximately $40 will suffice for this course. Again, purchasing SPSS is NOT required for this course as long as you can regularly access the library and/or computer labs to complete the SPSS-related HW sections. You will NOT need to have SPSS on your personal computer in order to view the online SPSS lab exercises but you will definitely need SPSS access to complete the three HWs. Aside from an internet connection, you will not need any special hardware/software to view the webcasts. You will click on a provided link and watch your screen/listen through your speakers/headphones as the instructor runs through a lecture/lab which can be paused, fast forwarded, rewound and saved for your viewing as often as you wish. You may want to bring a basic calculator with you to class. A calculator will be needed for the Final Exam and Quiz; cell phone calculators will NOT be permitted. The instructors recommend bringing a flash drive to save your in-class SPSS work, although these are not required.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Describe in writing the purpose of surveillance and how surveillance is used in public health practice • Explain the difference between incidence and prevalence • Describe the process of identifying and testing potential targets of intervention and give examples of effective and ineffective public health interventions • Describe the process of identifying vulnerable sub-populations, and give examples • Describe under what conditions screening is appropriate	• HW 1-3 • Descriptive epidemiology assignment • In-class quiz • Final exam
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe epidemiological studies, including observational, quasi- experimental and experimental studies • Differentiate between primary and secondary data collection and identify possible sources of secondary data • Explain the difference between correlation and causation; risk factors/predictors and causes • Describe the causal inferences which can be made from experimental, quasi-experimental and observational studies using published examples	• HW 1-3 • Critique • In-class quiz • Final exam
Adhere to ethical and social justice principles and standards	• Describe circumstances in which an experimental study would and would not be ethical • Describe major disparities in life expectancy nationally and globally	• Descriptive epidemiology assignment • Final Exam • HW 1 - 3

Interpret and analyze public health literature and apply evidence-based research	• Access and use published data to accurately describe in writing the health of populations and factors that affect health in terms of person, time and place characteristics • Distinguish between narrative and systematic reviews • Systematically review the literature on a specific topic using a PICO question	• Descriptive epidemiology assignment • HW 1-3 • Final exam
Apply basic statistical and informatics techniques	• Explain in a few sentences the principle of screening • Define lead time and length bias and how these biases may impact screening program evaluation • Describe in a few short sentences sensitivity, specificity, positive predictive value and negative predict value of a screening test compared to a gold standard test • Calculate and interpret a mean, a proportion, a rate and an odds ratio, • Explain the difference between relative and absolute risk • Calculate age-standardized rates	• HW 1-3 • In-class quiz • Final exam
Communicate public health information through oral, written, digital & visual presentation	• Describe the validity, utility and feasibility of tests used for screening and diagnosis of health conditions • Present visually information on key public health topics such as the major causes of death nationally and globally	• Descriptive epidemiology assignment • HW 1-3 • Final exam
Design and evaluate interventions to prevent or control public health problems	• List the strengths and weaknesses of different techniques for evaluating interventions • List the strengths and weaknesses of different techniques for controlling public health problems	• HW 1-3 • Critique • Final exam
Collect, analyze and interpret public health data	• Explain how to choose and apply appropriate study designs to answer a research question • Explain the interpretation of different measures of population health, such as life expectancy, quality adjusted life years	• HW 1-3 • Descriptive epidemiology assignment • Critique • Final exam

Course Assessments

Use of Blackboard (Bb)
No later than the first week of class, you must sign up for Blackboard to receive updates, in-class materials, recorded lectures, readings and assignments, as well as to submit your assignments. For instructions on registering for Bb, go to: http://bb.hunter.cuny.edu. Please make sure that you have access to Bb Hunter College.

If you encounter problems with Bb at any time throughout the semester, please immediately contact the Bb Helpdesk who have the expertise to assist you. The Bb contact information is (212) 650-3624 and studenthelpdesk@hunter.cuny.edu. *Instructors cannot assist students with Bb.*

Submission of assignments through Blackboard
In an attempt to save paper, homework and written assignments should be submitted electronically. Suggestions for other adjustments to the course to reduce environmental impact are always welcome. Be sure to check your Hunter email address and Blackboard regularly for class announcements and assignments.

Step-by-step instructions for uploading assignments onto Blackboard will be provided on each assignment. After uploading an assignment, the instructor recommends that you log out and then back in again to ensure your assignment has successfully posted to avoid receiving lateness point deductions. If Blackboard is down when attempting to upload an assignment, please email the assignment to the instructor by the due date/time.

PLEASE DO NOT FORGET TO INSERT YOUR NAME ON THE FIRST PAGE OF ALL ASSIGNMENTS.

VERY IMPORTANT: BE SURE TO CHECK YOUR HUNTER EMAIL AND BLACKBOARD *AT LEAST ONCE DAILY* FOR CLASS ANNOUNCEMENTS AND ASSIGNMENTS. SINCE THE COURSE IS SCHEDULED TO BE HELD PARTIALLY ONLINE, MANY IMPORTANT ANNOUNCEMENTS WILL BE SENT VIA EMAIL THROUGHOUT THE COURSE OF THE SEMESTER. PLEASE CHECK THE EMAIL ADDRESS OF YOUR HUNTER ACCOUNT AND CONFIRM THAT YOU ARE ABLE TO RETRIEVE MESSAGES SENT TO THIS ACCOUNT. THE BLACKBOARD HELPDESK WILL BE GLAD TO HELP.

Homework assignments: There will be 3 graded homework assignments to complete over the semester which will be posted on Bb well in advance of the due date. Each assignment will include multiple choice, short answer and SPSS questions. The assignments are organized according to the class lecture schedule so you may work through the assignment over time, completing the applicable sections soon after each lecture rather than leaving the assignment to the last minute. The final homework grade will be based on the highest 2 grades of the 3 assignments ONLY if all 3 assignments

have been fully completed (this includes the SPSS section) and submitted as described above. **Again, the lowest HW will NOT be dropped unless each HW is fully completed and submitted by the due date, including each SPSS section of the HW. I'm sorry, but to maintain fairness among your fellow classmates, there will be no exceptions.**

Descriptive epidemiology assignment: Conduct a literature search on one health condition of your choice and write a 3-4 page paper (double spaced, 12-point font, 1 inch margins) describing the epidemiology of this condition in terms of person, place and time. You must have at least 10 citations from the public health literature (peer-reviewed journals instead of websites). Please be sure to appropriately cite other people's work in AMA reference style. Additional instructions, regarding this assignment, will be posted within the first week or two of the semester.

An ungraded bibliography will be due several weeks prior to the paper. Although the bibliography will not be graded, it must be submitted in order to receive full credit for the paper. The bibliography will help ensure you are on the right track as MANY students fail to understand the unique nature of this assignment.

Quiz
You will have the first 20-30 minutes of the 3/17/16 class session to complete the in-class quiz which will consist of multiple choice and short answer questions in a format similar to the homework assignments. You are allowed to use a basic calculator (no cell phones) and you may bring **one page** of prepared notes (front and back on 8 1/2 x 11 inch paper). **The quiz is worth only 5% of your grade.** It is a chance for you and the instructor to assess your knowledge of the material covered thus far and to prepare for the final exam. Often, it will help students determine whether it would be wise to begin meeting with one of the instructors to clarify unclear concepts early in the semester. **There is no make-up for this quiz**

Critique: Choose one of two published papers and use a series of guiding questions (all posted on Blackboard) to develop a 3-5 page (double spaced, 12-point font, 1 inch margins) critical analysis of the paper you have chosen. Additional details, regarding this assignment, will be posted as time approaches.

In-Class Exam: The final exam will be held on 5/19/16. You will have the entire class period to complete the exam. The exam will consist of multiple choice and short answer and SPSS questions in a form similar to the homework assignments. Since you will NOT have access to a computer for you to run analyses in SPSS, the SPSS output will be provided for you to interpret. You are allowed to use a calculator (no cell phones) and you may bring 1 page of prepared notes (front and back on 8 &1/2 x 11 inch paper).

Online discussion/reflections: Participation in online discussions are part of your grade. Throughout the semester, Epi-related news articles/videos and questions of interest may be posted on Blackboard. The instructor will let you know when this material has been posted. Students will be expected to post their reactions/reflections

on this Blackboard discussion board using at least 3-5 complete sentences.

Help with research and writing

Hunter College's Reading/Writing Center is available to all students for guidance on paper writing (http://rwc.hunter.cuny.edu/). The Center is located on the 68th Street Campus in Thomas Hunter Hall Room 416, phone (212) 772-4212. Students may use this and other resources in preparing written assignments. Students should feel free to discuss their homework assignments with each other and to seek assistance from others in editing their papers to refine and clarify arguments. However, the final submitted work must be written by the student herself/himself; others may NOT contribute to the assignment by writing portions of it.

While students may ask peers for feedback on written assignments and brainstorm on solutions to the homework assignments, descriptive paper and critique paper; the final version of these assignments must reflect independent work and be written in each student's own language. ***In other words, no two homework assignments or papers should ever be similar to each other.***

When working on the assignments and paper, you will need to follow these guidelines:

- All sources must be referenced and quotations identified. If there is any doubt about proper procedures, students should consult the instructor.
- If you use or paraphrase another person's ideas, you must acknowledge the source in a proper citation.
- If you use the actual words or expressions of another person or source, including the Internet, you must indicate such use by incorporation of quotation marks and a proper citation.
- You are to provide your own work, not someone else's. Examples of using someone else's work include: submitting essays or portions of essays written by other people as one's own; or collaborating with others on an assignment or examination without specific permission from the faculty member to do so.
- Students may not submit material prepared for one course to fulfill the requirements for a second course without having received prior written permission from the instructors.

Grading

Evaluation Criteria

The total number of points assigned to each HW, quiz and final exam question will be listed after each question. Likewise, the total number of points assigned to each section of the required papers will be listed on the paper instructions.

The relative weight of each course component is as follows:

Assessment	Weight
HW Assignments (2/3) (See above under HW Assignments)	25%
Descriptive Epi Assignment	20%
In-Class Quiz	5%
Critique Assignment	20%
In-Class Exam	25%
Online Discussions/In-class Participation	5%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw

from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Please check the Registrar's website for the most up-to-date information: http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%208-20-2015.pdf

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation

As described above, 5% of your grade will be based on attendance and class participation. Since the instructor understands that students may not all be able to attend all classes, recorded lectures and labs will be provided when requested to help catch up with missed material. However, since the in-person sessions are designed to promote discussion in a face-to-face environment and to more carefully review the material covered during the online sessions, the instructor expects students to attend the in-person sessions. Class will begin promptly to maximize our time together. Please arrive to class on time and inform the instructor of unavoidable absences. Mandatory class sessions are on the quiz and final exam dates listed below because there is no make-up quiz or final exam.

Late/incomplete submission of assignments

Homework assignments and papers are due electronically on Bb on the dates listed on the Course Schedule below. If Bb is down, email the assignments to the instructor (email address is listed above on Page 1) and then contact Bb for assistance. Late homework assignments will have 3 out of 100 points deducted per day (including weekends) and late papers will have 1.5 out of 50 points deducted per day (including weekends). Both HWs and papers will not be accepted more than 3 days late. A zero

grade will be assigned to any HW or paper that misses the deadline and, to maintain fairness among your fellow classmates, this zero grade will NOT be dropped from your overall grade.

Make-ups, rewrites, and extra credit

No make-up tests will be given if you fail to attend the in-class quiz or final exam.

To maintain fairness among all students, extra credit assignments will not be offered to make up for a low grade. For the same reason, extensions for assignments will not be offered as mentioned above.

Expectations of students

Attend and very carefully review lectures & labs, read textbook and any articles prior to class, participate during class discussions, seek help/ask questions early and often.

Expectations for the instructor

The instructor is available during office hours and by appointment to assist students with homework, course material, exam preparation and assignments throughout the semester. The preferred method of communication with the instructor is email. Since Instructors are generally teaching more than one course and receive many email messages, **please always put your name and course number into the email header.**

The instructor will respond to emails within 24-48 hours, including weekends. Generally, graded assignments with feedback will be returned within two weeks but do not hesitate to tell the instructor you would prefer to receive your feedback sooner.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents)

as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester although this is unlikely. The "Last Updated" Date in the header of the syllabus is meant to reference the current version of the syllabus and, therefore, will be updated if a change in schedule is made. You will be made aware of any amendments to the syllabus or course schedule.

Please refer to the current academic calendar for important dates (holidays, course drop, withdrawal):

http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%208-20-2015.pdf

Course Schedule				
In-Person Sessions are Shaded				
	Date	**Topic**	**Workshops/Exercises** **(Using calculator and SPSS)**	**Readings and Assignments**[1]
1	2/4/16 IN PERSON	Introduction to epidemiology	Introduction to database design	Gordis, Chapter 1
2	2/11/16 ONLINE	Measures of disease occurrence Study design: cross-sectional	Analyze and interpret cross-sectional study data	Gordis, Chapters 3 & 4

Last Updated: February 2, 2016

Course Schedule				
In-Person Sessions are Shaded				
	Date	**Topic**	**Workshops/Exercises** **(Using calculator and SPSS)**	**Readings and Assignments[1]**
3	2/18/16 IN PERSON	Study design: cohort	Analyze and interpret cohort study data	Gordis, Chapter 9 **Draft Bibliography for Descriptive Epi Paper due FRIDAY, Feb. 19 at 11:30PM**
4	2/25/16 ONLINE	Study design: case control	Analyze and interpret case control study data	Gordis, Chapter 10 **HW 1 due MONDAY, Feb. 29 at 11:30pm**
5	3/3/16 ONLINE	Study design: clinical trials	Analyze and interpret clinical trial data	Gordis, Chapters 7 & 8
6	3/10/16	Surveillance Study design: Ecological	Direct age standardization Analyze and interpret ecological study data	Gordis, Chapters 4 & 6 **Completion of "The Ghost Map" due for this session.**
7	3/17/16 IN PERSON	**QUIZ (in-class)[2]** Bring basic calculator, pencils/pens and one 8 ½ x 11 page of notes	Overall review of all study designs and SPSS exercises. Brief Introduction to Hypothesis Testing	**Paper 1 due MONDAY, March 21 at 11:30pm**

Last Updated: February 2, 2016

Course Schedule				
In-Person Sessions are Shaded				
	Date	**Topic**	**Workshops/Exercises** **(Using calculator and SPSS)**	**Readings and Assignments[1]**
8	3/24/16 IN PERSON	Hypothesis testing Critical reading of epidemiologic literature	Dissecting an article using Kendzor et al. article (Hypothesis testing lab next week)	Gordis, Chapters 11 & 12 Kendzor DE, et al. Financial strain and smoking cessation among racially/ethnically diverse smokers. *Am J Pub Health*. 2010;100:702-6. Goodman S. A dirty dozen: twelve p-value misconceptions. *Semin Hematol*. 2008;45:136-40 (with erratum 2011:48:302. **HW2 due MONDAY, March 28 at 11:30pm**
10	3/31/16 ONLINE	Selection bias & confounding	SPSS: hypothesis testing, statistical significance and the role of bias.	TBA
11	4/7/16 IN PERSON	Mediation & effect modification	Stratified analysis to test for mediation (MH OR) and effect modification (Breslow-Day test)	Aschengrau, Chapter 14: Critical Review of Epidemiologic Studies
9	4/14/16 ONLINE	Information bias: validity and reliability	Calculate validity (sensitivity/specificity) of a measure and reliability (kappa)	Gordis, Chapter 15

Course Schedule				
In-Person Sessions are Shaded				
	Date	**Topic**	**Workshops/Exercises** **(Using calculator and SPSS)**	**Readings and Assignments[1]**
10	4/21/16 ONLINE	Infectious disease epidemiology / Screening	Implementing an outbreak investigation / Assess how well a screening test performs	Gordis, chapter 2, 5 & 18 **HW3 due FRIDAY, APRIL 22 at 11:30pm**
NO CLASS - SPRING BREAK **4/28/16**				
13	5/5/16 IN PERSON	Causation	Exam Review	Gordis, Chapters 14 & 15 **PAPER2 due Monday, May 9 at 11:30pm**

Course Schedule				
In-Person Sessions are Shaded				
	Date	**Topic**	**Workshops/Exercises** **(Using calculator and SPSS)**	**Readings and Assignments[1]**
14	5/12/16 ONLINE	Ethics	SPSS Review	Gordis, Chapter 20 Coughlin SS. Ethical issues in epidemiologic research and public health practice. *Emerg Themes in Epidemiol.*2006, 3:16, doi:10/1186/1742-7622-3-16. Jaakola MS. et al. Environmental tobacco smoke and adult-onset asthma: a population-based incident case-control study. *AJPH*: 2003;93:2055-60.
15	5/19/16 IN PERSON	**Final Exam (in-class)[2]** Bring basic calculator, pencils/pens and one 8 ½ x 11 page of notes (only notes allowed).		

[1]You are expected to complete readings in Gordis before on- or off-campus session. Supplemental readings (in italics) are extra resources and entirely optional. Homework and papers must be uploaded to Blackboard by due date and time as listed on this Course Schedule above.

[2] For exam and quiz, bring a basic calculator and one 8 & 1/2x11 page of notes (front and back).

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PH75200: Fundamentals of Epidemiology (online)
3 Credits
Spring 2016

Time and location	This is a fully online course. Weekly lectures **will be made** available online on Blackboard. Students will be able to view online materials at any time based on their own schedule.
Instructor	Sheng Li, PhD, MD, MPH — Rosann Costa, MA **Email** sheng.li@sph.cuny.edu — rc181@columbia.edu **Phone** 646-664-8349 — 212-305-9346 **Office** Room 805, 55 W. 125th Street, New York, NY 10026 E-mail is the preferable method of contact for both instructors.
Office hours	There is **NO** physical office hour. Individual personal meeting with instructors can be arranged through email if needed.
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Apply principles and methods of epidemiological analysis. Identify and interpret epidemiological data. Illustrate and investigate incidence, distribution, determinants, and control of disease.
Course prerequisites	N/A Should have ability to use a computer, access emails, use a web browser (Internet Explorer, Firefox, or Safari) and Microsoft Office applications, and use the Blackboard system on a daily basis.
Course format	This is an online course. This course is taught through a mix of online lecture, online discussion, individual assignment, online exam, and course project paper. Course contents are divided into 15 weekly sessions to be completed over the Spring 2016 semester. Each weekly session involves viewing multiple lecture recordings, each approximately 15-20 minutes long. PowerPoint slides will be provided to accompany the recordings. Additionally, most weekly sessions will include an SPSS lab exercise. All course materials will be made available on

	Blackboard (Bb).
Required reading and resources	Gordis L. Epidemiology. 4th or 5th ed. Philadelphia, PA: Saunders Elsevier, 2009 or 2013. (on reserve at the Silberman library) Required to subscribe by email to Morbidity and Mortality Weekly Reports, published by the CDC: http://www.cdc.gov/mmwr/ *(no fee)* Any additional assigned articles will be posted on Blackboard.
Suggested reading and resources	Aschengrau A, Seage III GR. Essentials of Epidemiology in Public Health. 3rd ed. Sudbury, MA: Jones & Bartlett, 2014. Rothman K.. Epidemiology – An introduction. New York, NY: Oxford University Press, 2002. (Both of these texts are on reserve at the Silberman library) **Very Important: Be sure to check your Hunter email account and Blackboard *at least once daily* for class announcements and assignments. Since the course is scheduled to be held partially online, many important announcements will be sent via email throughout the course of the semester. Please check the email address of your Hunter account and confirm that you are able to retrieve messages sent to this account. The blackboard helpdesk will be glad to help. This important request will likely be repeated throughout this syllabus.**

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Apply the public health core functions of assessment, policy development and assurance	• Describe in writing the purpose of surveillance and how surveillance is used in public health practice • Explain the difference between incidence and prevalence • Describe the process of identifying and testing potential targets of intervention and give examples of effective and ineffective public health interventions • Describe the process of identifying vulnerable sub-populations, and give examples • Describe under what conditions screening is appropriate	• 3 HWs and Descriptive epidemiology written assignment • Weekly quizzes • Midterm exam • Final exam
2. Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe epidemiological studies, including observational, quasi- experimental and experimental studies • Differentiate between primary and secondary data collection and identify possible sources of secondary data • Explain the difference between correlation and causation; risk factors/predictors and causes • Describe the causal inferences which can be made from experimental, quasi-experimental and observational studies using published examples	• 3 HWs, Critique paper • Weekly quizzes • Midterm quiz, • Final exam
3. Adhere to ethical and social justice	• Describe circumstances in which an experimental	• Weekly quizzes

principles and standards	study would and would not be ethical • Describe major disparities in life expectancy nationally and globally	• 3 HWs • Final exam
4. Interpret and analyze public health literature and apply evidence-based research	• Access and use published data to accurately describe in writing the health of populations and factors that affect health in terms of person, time and place characteristics • Distinguish between narrative and systematic reviews • Systematically review the literature on a specific topic using a PICO question	• Descriptive epidemiology written assignment • 3 HWs • Final exam •
5. Apply basic statistical and informatics techniques	• Explain in a few sentences the principle of screening • Define lead time and length bias and how these biases may impact screening program evaluation • Describe in a few short sentences sensitivity, specificity, positive predictive value and negative predict value of a screening test compared to a gold standard test • Calculate and interpret a mean, a proportion, a rate and an odds ratio, • Explain the difference between relative and absolute risk • Calculate age-standardized rates	• 3 HWs, • quizzes • Final exam •
6. Communicate public health information through oral, written, digital & visual presentation	• Describe the validity, utility and feasibility of tests used for screening and diagnosis of health conditions • Present visually information on key public health topics such as the major causes of death nationally and globally	• Descriptive epidemiology written assignment • 3 HWs and Final exam
7. Design and evaluate interventions to prevent or control public health problems	• List the strengths and weaknesses of different techniques for evaluating interventions • List the strengths and weaknesses of different techniques for controlling public health problems	• 3 HWs and Critique paper • Final exam
8. Collect, analyze and interpret public	• Explain how to choose and apply appropriate study designs to answer a research question	• 3 HWs and Descriptive epidemiology written

health data	• Explain the interpretation of different measures of population health, such as life expectancy, quality adjusted life years	assignment • Critique paper • Final exam

Grading

Evaluation criteria

The students will be assessed through a mix of homework assignments, epidemiology papers, weekly quizzes, a midterm quiz, a final exam and Blackboard Discussion postings.

The relative weight of each course component is as follows:

Assessment	**Weight**
Homework Assignment (2/3)	20%
Descriptive Epidemiology Written Assignment	15%
Critique Epidemiology Paper	15%
Weekly Quick Quiz (14)	14%
Midterm Exam	6%
Final Exam	20%
Online Discussion Board (4)	8%
Midway survey	1%
Exit survey	1%
Optional biweekly online virtual office hour	0%
	100%

The grading system for the course follows the guidelines in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Homework Assignments

There will be **3** graded homework assignments to complete over the semester which will be posted on BB in advance of the due date. Each assignment includes multiple choice, and short answer questions including SPSS questions. The assignments are organized according to the class lecture schedule so you may work through the

assignment over time, completing the applicable sections soon after each lecture rather than leaving the assignment to the last minute. The final homework grade will be based on **the highest 2 grades** of the 3 assignments ONLY if all 3 assignments have been fully completed (this includes the SPSS section) and submitted as described above. The lowest HW will **NOT** be dropped unless each HW is fully completed and submitted by the due date, including each SPSS section of the HW. You will need access to SPSS to complete the HW assignments.

Descriptive Epidemiology Written Assignment

Students will be provided with several questions to answer regarding the descriptive epidemiology of public health conditions. These questions will be posted on Bb in advance of the due date.

Critique Epidemiology Paper

Each student will choose one of two published epidemiological study papers and use a series of guiding questions (all will be posted on Blackboard) to develop a 3-5 page (double spaced, 12-point font, 1 inch margins) critical analysis of the paper you have chosen.

Weekly Quiz

You will take a weekly quiz focusing on weekly lecture contents. In general, the quiz will consist of 5 multiple-choice questions. Each question may have a single or multiple correct answers, and you need to select all that apply. The purpose of the weekly quiz is to ensure students viewing materials on time. It is a chance for you to assess your knowledge of the material covered in that week. Thus the quiz is straightforward and is close to the lecture contents. **All 14 weekly quizzes are together worth 14% of your grade.** The weekly quiz must be taken before11:30 pm last day in a week (see course schedule below for week periods). You can take the quiz two times and the best score will be the final. The quiz is timed and it will automatically end 30 minutes after you click to start even you are not done. **There is no make-up for this quiz**.

Online Midterm Exam

You will have a brief online midterm exam that will consist of multiple choice and short answer questions in a format similar to the homework assignments. **The midterm exam is worth 6% of your grade.** It is a chance for students to assess knowledge of the material covered thus far and to prepare for the final exam. It will help students determine whether it would be wise to begin meeting with one of the instructors to clarify unclear concepts early in the semester. The exam will available on Bb in a period of 24 hours. The exact time and rules will be posted on Bb before the week of midterm exam (see course schedule below). **There is no make-up for this quiz.**

Online Final Exam

The final online exam will take place in the final week of the semester. The exam will consist of multiple choice and short answer, including SPSS questions in a form similar to the homework assignments. Since the SPSS output will be provided for you to

interpret, you will not to run any analyses in SPSS. Instructors suggest that you have a calculator available for the exam. The exam will available on Bb in a period of 24 hours. The exact time and rules will be posted on Bb before the final exam week (see course schedule below). **There is no make-up for this final exam.**

Online Discussion Board Postings

Discussion Boards are one of the most commonly-used channels for sharing information and promoting critical thinking in an online class. Participation in online discussions is part of your grade.

There will be **4** discussion forums in this course. You will be expected to post your reflections/reactions on this Blackboard discussion board using at least 3-5 complete sentences. Your participation in all 4 discussion forums will bee worth **8% of your grade**. The discussion boards will typically involve an Epi-related news articles/videos, posted for you by the Instructors, along with questions of interest for you to answer. Instructors will let you know when this material has been posted.

Midway and Exit Survey

To improve our online teaching and learning, students are expected to respond to 2 brief surveys: Midway and Exit survey. The course may be modified based on these survey results during and after this semester. Each survey will contribute 1 point to your course grade.

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and Class Participation

As described above, a significant part of your grade will be based on online attendance and participation. The recorded lectures and labs provide great flexibility for student learning. However, we expect students to attend at least half of the online office hour sessions.

Late/incomplete Submission of Assignments

Homework assignments and papers are due electronically on Bb on the dates listed on the Course Schedule below. If Bb is down, email the assignments to both instructors and then contact Bb for assistance. Late homework assignments will have 3 points out of 100 points deducted per day (including weekends) and late papers/other written assignments will have 1.5 out of 50 points deducted per day (including weekends). Both HWs and papers/written assignments will not be accepted more than 3 days late. A zero grade will be assigned to any HW or paper that misses the deadline and, to maintain fairness among your fellow classmates, this zero grade will NOT be dropped from your overall grade.

Make-ups, Rewrites, and Extra credit

No make-up tests will be given if you do not take the online quiz and exam on time. To maintain fairness among all students, we do not offer any or extra credit assignments to make up for a low grade or any extensions for assignments.

Expectations of Students

Students need to take greater effort to be successful in online learning than in face-to-face learning. You must be self-motivated and self-disciplined because it is easy to fall behind in online learning. Please keep yourself on schedule with reading, assignments, online class activities etc. It is extremely important that students take ownership of the learning for online course, and to demonstrate their ownership. Students are expected to be full participants throughout the entire semester.

It is very important that we keep connected and interact with one another. If you have questions, please feel free to use email, discussion board, text, or phone to contact your Instructors or your classmates. Learning in a community is more effective.

Online participation and communication are paramount to the success of this course, and they are an integral part of this course, and will count significant part of your grade.

Students are expected to:
1. Spend anywhere from 10-12 hours per week on reviewing lectures & labs, and reading the textbook:
2. Complete the early class tasks (explore BB, welcome video) at the beginning of first week.
3. Check your e-mail and Announcements on Blackboard DAILY.
4. Submit assignments/papers online through Blackboard.
5. Participate in the 4 discussion board activities.
6. Seek help/ask questions early and often.
7. Check grades and feedback regularly.

Expectations for the Instructors

The instructors will try their best to be available as often as possible throughout the semester to assist students with homework, course material, exam preparation and assignments.

You can expect from instructors:
1. The instructors are available by appointment. The preferred method of communication with the instructors is **email.** Please always put your name and course number into the email header.
2. The instructors will respond to course related questions within 24-48 hours during weekdays. Emails sent after Friday 5PM will be responded on next Monday. If your question is urgent, please insert "URGENT" in the subject field of your email message.
3. If your questions are relevant and important to others, the instructors will post them in Bb Announcements or on the discussion board.
3. The instructors will typically post announcements and reminders once per week, or more frequently, if needed.
4. The instructors will give feedback on submitted assignments within 2 weeks after the deadline due to the large online class size.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

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Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents)

as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Hardware/software

SPSS will be used for data analysis in this class and will be required for parts of the homework assignments and SPSS lab exercise. The Hunter College license covers only on-campus use. The SPSS software is available for student use in the library and in computer labs at multiple Hunter campuses. Students who wish to purchase a student copy of SPSS can do so at www.onthehub.com. SPSS Statistics Base GradPack 23 for 6 months for Mac or Windows for approximately $40 will suffice for this course. Again, purchasing SPSS is suggested but is NOT required for this course as long as you can regularly access the library and/or computer labs to complete the SPSS-related HW sections. You will NOT need to have SPSS on your personal computer in order to view the online SPSS lab exercises but you will definitely need SPSS access to complete the HWs.

You need MS PointPower to watch weekly primary lecture PPT file. You will not need any special hardware/software to view the SPSS lab webcasts aside from an internet connection. You will click on a provided SPSS lab link and watch your screen/listen through your speakers/headphones as the Instructor runs through a SPSS lab which can be paused, fast forwarded, rewound and saved for your viewing as often as you wish.

You may want to have a basic calculator for the homework, exam and Quiz.

Help with research and writing

Hunter College's Reading/Writing Center is available to all students for guidance on paper writing (http://rwc.hunter.cuny.edu/). The Center is located on the 68th Street Campus in Thomas Hunter Hall Room 416, phone (212) 772-4212. Students may use this and other resources in preparing written assignments. Students should feel free to discuss their homework assignments with each other and to seek assistance from others in editing their papers to refine and clarify arguments. However, the final submitted work must be written by the student herself/himself; others may NOT contribute to the assignment by writing portions of it.

While students may ask peers for feedback on written assignments and brainstorm on solutions to the homework assignments, descriptive paper and critique paper; the final version of these assignments must reflect independent work and be written in each student's own language. In other words, no two homework assignments or papers should ever be similar to each other.

When working on the assignments and paper, you will need to follow these guidelines:

- All sources must be referenced and quotations identified. If there is any doubt about proper procedures, students should consult the Instructors.
- If you use or paraphrase another person's ideas, you must acknowledge the source in a proper citation.
- If you use the actual words or expressions of another person or source, including the Internet, you must indicate such use by incorporation of quotation marks and a proper citation.
- You are to provide your own work, not someone else's. Examples of using someone else's work include: submitting essays or portions of essays written by other people as one's own; or collaborating with others on an assignment or examination without specific permission from the faculty member to do so.
- Students may not submit material prepared for one course to fulfill the requirements for a second course without having received prior written permission from the instructors.

Use of Blackboard (Bb)

No later than the beginning of the first week, you must sign up for Blackboard to receive updates, class materials, recorded lectures, readings and assignments, as well as to submit your assignments. For instructions on registering for Bb, go to: http://bb.hunter.cuny.edu. Please make sure that you have access to Bb Hunter College.

If you encounter problems with Bb at any time throughout the semester, please immediately contact the Bb Helpdesk who has the expertise to assist you. The Bb contact information is (212) 650-3624 and studenthelpdesk@hunter.cuny.edu. *Instructors cannot assist students with BB.*

Submission of Assignments through Blackboard

In an attempt to save paper, homework and written assignments should be submitted electronically. Be sure to check your Hunter email address and Blackboard regularly for class announcements and assignments.

Step-by-step instructions for uploading assignments onto Blackboard will be provided on each assignment. After uploading an assignment, the instructor recommends that you log out and then back in again to ensure your assignment has successfully posted to avoid receiving lateness point deductions. If Blackboard is down when attempting to upload an assignment, please email the assignment to both instructors by the due date/time. Please do not forget to insert your name on the first page of all assignments.

Course Schedule
The schedule is subject to change throughout the semester.

Please refer to the current academic calendar for important dates (holidays, course drop, withdrawal):
http://www.hunter.cuny.edu/onestop/repository/files/registrar/Academic%20Calendar%20Fall%202015%20thru%20Spring%202016%2010-19-20151.pdf

Date*	**Topic**	**SPSS Lab Exercises**	**Reading & Assignments**
Week 0 Before 1/31/2016	Explore BB View introduction to the course video	NA	
Week 1 1/31 – 2/6	Introduction to Epidemiology	SPSS Exercise: Introduction to database design	Gordis, Chapter 1
Week 2 2/7 – 2/13	Measures of disease occurrence and association	SPSS Exercise: Introduction to disease occurrence measures	Gordis, Chapter 1
Week 3 2/14 – 2/20	Causation and risk in epidemiology	NA	Gordis, Chapter 14
Week 4 2/21 – 2/27	Surveillance Study Designs: Cross-sectional study designs	SPSS Exercise: Cross-sectional study data analysis	Gordis, Chapter 3
Week 5 2/28 – 3/5	Study designs: Cohort study design (prospective & retrospective)	SPSS Exercise: Cohort study data analysis	Gordis, Chapter 9
Week 6 3/6 – 3/12	Study designs: Case-control study design	SPSS Exercise: Case-control study data analysis Online office hour	Gordis, Chapter 10 **HW1 DUE at 3/12 11:30 pm**
Session 7 3/13 – 3/19	Study designs: Clinical trials (RCTs)	SPSS Exercise: RCT data analysis	Gordis, Chapters 7 & 8

Week 8 3/20 – 3/26	Ecological Study Design Screening	SPSS Exercise1: Ecological Study Design data analysis SPSS2: Screening lab/paper and pencil exercise	Gordis, Chapters 4 & 6 Gordis, Chapter 20 **DESCRIPTIVE EPI WRITTEN ASSIGNMENT DUE at 3/30 11:30 pm**
Week 9 3/27 – 4/2 Midterm Exam	Overall Review of Cohort, Case-Control and RCT Study Designs / Related SPSS Exercises Critical Review of Epidemiologic Medical Literature	No SPSS	Kendzor DE, et al. Financial strain and smoking cessation among racially/ethnically diverse smokers. *Am J Pub Health*. 2010;100:702-6.
Week 10 4/3 – 4/9	Hypothesis Testing Ethics in Research	SPSS Exercise: Hypothesis Testing	Gordis, Chapters 11 & 12 Goodman S. A dirty dozen: twelve p-value misconceptions. *Semin Hematol*. 2008;45:136-40 (with erratum 2011:48:302. **HW2 DUE at 4/9 11:30 pm**
Week 11 4/10 – 4/16	Bias & confounding	SPSS Exercise: Assessing & removing confounding through stratified analysis & MH adjusted OR	Aschengrau, Chapter 13, 15
Week 12 4/17 – 4/21	Confounding, mediation & effect modification	SPSS Exercise: Assessing mediation & effect modification in stratified analysis	Aschengrau, Chapter 14:
April 22 - April 30, 2016 Spring recess No class			

Week 13 5/1 – 5/7	Measurement: reliability, internal and external validity	SPSS Exercise: Reliability and validity	Gordis, Chapter 15 HW3 Due at 5/7 11:30 pm
Week 14 5/8 – 5/14	Infectious disease epidemiology Final exam review	SPSS: Outbreak Analysis Screening lab/paper and pencil exercise	Gordis, chapter 2, 5 & 18 **CRITIQUE PAPER DUE at 5/14 11:30 pm**
Week 15 5/15 – 5/21	Online FINAL EXAM Exit survey		Gordis, Chapter 20 Coughlin SS. Ethical issues in epidemiologic research and public health practice. *Emerg Themes in Epidemiol.*2006, 3:16, doi:10/1186/1742-7622-3-16.

* A week session period is defined here. The first date indicates the 1st of a week session and the 2nd date indicates the last day of a week session. For example, 2/7/2016 will be the first day of week 2 and 2/13/2016 will be the last day of week 2.

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College

PH 754 Fundamentals of Environmental Health (In-Class)

3 Credits - Spring 2016 – Room 218

Time and location	Monday 8:00 – 9:45 pm weekly for 15 sessions. Room 218 (Silberman)
Instructor	Jack Caravanos, DrPH, CIH Professor, CUNY School of Public Health 2180 3rd Ave, Room 720 Phone 212-396-7780 (do not leave messages) jcaravan@hunter.cuny.edu
Office hours	Online and Thursday 4-6 pm in my office
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Survey of chemical, physical and biological factors influencing quality of ambient, workplace and home environments. Topics include: air and water pollution; radiation; hazardous substances; solid wastes; food protection; and natural and human-made disasters.
Course prerequisites	None
Course format	This course is present in weekly units (lessons) dispersed with weekly internet assignments and periodic short quizzes. and assignments.
Required Reading	• Our Global Environment: A Health Perspective, Anne Nadakavukaren, 7th Edition, Waveland Press, ISBN-13: 978-1577666868 (available online as hardcopy or eTextbook) • A Civil Action – Jonathan Harr, Vintage Press (non-fiction paperback available online)
Suggested reading and resources	Posted online as needed.

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Describe approaches for identifying and assessing the human and ecological impacts of workplace, community, and residential environmental hazards	• Assignments, online quizzes and in section exam
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Explain the importance of working collaboratively with diverse communities, sectors, and constituencies in the development, implementation, and evaluation of workplace and environmental health programs and policies. • Describe the elements, appropriate use and limitations of key risk assessment, risk management and risk communication strategies	• Online quizzes and in section exam
Apply basic statistical and informatics techniques	• Use informatics techniques to retrieve, analyze and summarize environmental health data • Use spreadsheet applications to collect, conduct descriptive analyses, and graphically represent data	• Environmental data project, online assignments
Communicate public health information through oral, written, digital and visual presentation	• Construct a multimedia learning module on an environmental topic using published data	• Environmental data project
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Understand the basic mechanisms of toxicity and pathobiology • Achieve a basic understanding of how genetic, physiologic, psychosocial factors influence susceptibility to adverse health outcomes following exposure to workplace, community, and residential environmental hazards • Identify the major types and sources of environmental agents that can impact health in workplace, urban community and residential settings. • Describe the pathways by which major environmental agents cause human exposure in workplace, urban community and residential settings. • Explain the reasons, sources, and impacts of inequitable distribution of environmental hazards	• Assignments, online quizzes and in section exam
Design and evaluate interventions to prevent or control public health problems	• Describe basic concepts and strategies for controlling environmental hazards in workplace, community, and residential settings and the advantages and limitations of	• Assignments, online quizzes
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Identify the major provisions, accomplishments and limitations of key environmental and occupational regulatory programs, guidelines, and authorities at the federal, state and local level.	• Online quizzes and in section exam

Course Assessments

Details about the assignments can be found on the course website as lessons are presented. There are 3 exams based on 4-5 lessons and 6 quizzes based on short environmental presentations usually of historical value.

Environmental Data Project:

On the first day of class you will be given an environmental topic to research. Each student must assemble tabular and graphical data on this topic and submit an interpretation through a narrated PowerPoint presentation. The format of the presentation should be 5 tables, figures, graphs with a written paragraph describing the findings. Grading will be based on format, quality of graphs and data representation, organization and effectiveness of presentation. Use PPTs "narration" feature to record your presentation. You will submit this through BB as either a narrated PPT or common video file (MP4, WMV or QuickTime)

The assignment must include (in this order):

- Title Slide (include name, course information, date)
- Purpose/Objectives slide
- Table of Contents slide
- The 5 Tables, Figures, Illustrations etc
- Summary Slide
- Professional style reference list

The presentation must proceed from general to specific and should temporal and spatial variables. Do not use all graphs or all figures (variety is desired).

For example let's say your topic was "Environmental Asthma"; here are 5 appropriate tables/graphs:

1. Table of Environmental Asthma triggers
2. Figure of Asthma rates for entire US (color coded?)
3. Graph or table of Asthma rates in NYC by borough
4. Graph or table of Asthma rates in NYC by year (1990-2003)
5. Graph or table of Asthma rates in NYC by who is affected (gender, ethnicity, age)

Grading Criteria for Course

Exam 1,2,3	2 x 20% =	60%
Quizzes 1-6	6 x 4% =	24%
Env Data Assignment	1 x 10% =	10%
In Line Assessments	many	6%
		100%

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Attendance and class participation
This is a fully online course and attendance is not recorded. The synchronous (live) sessions are strongly recommended and students will be responsible for comments or notices made in these sessions. Each synchronous session is recorded for future viewing in the event you cannot attend the live sessions.

Late/incomplete submission of assignments
Late or incomplete assignments are accepted with penalty unless approved by instructor.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students
- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion and online forums.
- Complete all assignments by their assigned due date (10% penalty per week late will be applied)
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor
- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours
- Grading and feedback on assignments (when applicable) within 1 week after the due date.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity
Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule:
Also refer to the current academic calendar for important dates.

Class	Date	Topic	Readings	Assgn Due Date
Pre		Understanding BB, Reviewing site Practice Quiz	BB Online Student Resources	
1	Feb 1	Lesson 1: Course Welcome / Introduction to Env Health / Environmental Controls	Chp 1, p2-5, Chp 2, p33-54, Box 1-4 www.epa.gov, www.cdc.gov/atsdr	Feb 7
2	Feb 8	Lesson 2: Environmental Law / National Env Policy Act of 1969	Start reading "A Civil Action" www.epa.gov/lawsregs/	Feb 15
	Feb 15	NO CLASS – Holiday		
	Feb 15	**Quiz: Lake Nyos (due at 11:59 pm)**		Feb 15
3	Feb 22	Lesson 3: Hazard Identification, Evaluation and Control	Chapter 7, p155-158	Feb 29
4	Feb 29	Lesson 4: Environmental Toxicology / Public Health Biology / Human Disease	Chapters 6 & 7, Box 6-3 and 6-4 www.cdc.gov/atsdr, http://toxtown.nlm.nih.gov/	Mar 7
	Mar 7	**Quiz: Minamata Disease (due at 11:59 pm)**		Mar 7
5	Mar 7	**EXAM #1 ((available until 3/10 11:59pm)**	Lessons 1-4, 2 quizzes & Civil Action p0-146	
6	Mar 14	Lesson 5: Air Pollution Basics	Chapter 11 and 13	Mar 21
7	Mar 21	Lesson 6: Air Pollutants and Health	Chapter 13, Box 13-3, 13-6 www.epa.gov/air www.who.int/phe/health_topics	Mar 28
	Mar 28	**Quiz: Gauley Bridge (due at 11:59 pm)**		Mar 28
8	Mar 28	Lesson 7: Water Supply and Health	Chapter 15 (all), Box 15-2 www.epa.gov/water www.who.int/phe/health_topics	Apr 4
9	Apr 4	Lesson 8: Water Pollution and Health	Chapter 16, Box 16-2, 16-5, www.water.epa.gov/polwaste/wastewater/ www.who.int/phe/health_topics	Apr 11
	Apr 11	**Quiz: Queens Aquifer (due at 11:59 pm)**		Apr 11
10	Apr 11	**EXAM #2 (available until 4/8 11:59pm)**	Lessons 5-8, 2 quizzes & Civil Action p147-376	
11	Apr 18	Lesson 9: Sustainability /Green Buildings / Climate Change	Chp 1 p12, Chp 12, p 281-322 www.epa.gov/climatechange,www.usgbc.org	May 2
	Apr 25	NO CLASS – Spring Break		
12	May 2	Lesson 10: Food Contaminants and Safety	Chapter 9, Box 9-5 www.fda.gov/Food/FoodSafety	May 9
	May 2	**Quiz: Filthy Cities (due at 11:59 pm)**		May 9
13	May 9	Lesson 11: Consumer Product Safety and Safety Engineering	No readings in textbook. www.osha.gov, www.cdc.gov/injury/wisqars/, www.cpsc.gov	May 16
14	May 16	Lesson 12: Land Contamination (Solid and Hazardous Wastes)	Chapter 17, www.epa.gov/solidwaste www.epa.gov/superfund	May 23
	May 23	**Quiz: Love Canal (due at 11:59 pm)**		May 23
15	May 23	**EXAM #3 (available until 5/20 11:59pm)**	Lessons 9-12, 2 quizzes & Civil Action p380-494	
	May 23	**Env. Data Assignment Due (by 11:59 pm)**		May 23

CUNY SCHOOL OF PUBLIC HEALTH

Hunter College

PH 75500

FUNDAMENTALS OF SOCIAL AND BEHAVIORAL HEALTH
3 credits

SPRING 2016

Catalogue description: This course provides a topical and theoretical survey of social and behavioral issues in public health

Course meets: Fully online

Instructor: Professor Michele Greene, DrPH

Email: MGGreene@brooklyn.cuny.edu

Phone: 718-951-5000 ext. 2756 Please do NOT leave voicemail.

Office: 4109 Ingersoll Hall, Brooklyn College

Office Hours at Brooklyn College: 7:30 - 9:00 AM, Tuesday and Thursday

11:00 AM – 12:45 PM Tuesday and Thursday*

*Please note that on some Tuesdays and Thursdays I may not be available during these office hours because of meetings. If you plan to come in, please arrange a specific appointment time via email.

Required books: NA

Required materials: Required readings and assigned materials are posted on Blackboard.

This is an asynchronous, fully online course. This means that, as with a traditional class, you are responsible for weekly readings and activities. Unlike a traditional class, you are expected to independently access and view PowerPoint presentations when available, and to participate in online Discussion Boards (DB), as well as to complete activities and take exams online.

It is **YOUR** responsibility to successfully log onto Blackboard and participate in the course throughout the semester.

The email for the student help desk is: studenthelpdesk@hunter.cuny.edu and the phone number is: 212-650-3624. The student help desk is located in Thomas Hunter Hall on the 4th floor. The link to the student resources page is: http://www.hunter.cuny.edu/it/blackboard/student-documentation-and-support-for-blackboard

The online technical components of the class will NOT be managed by the course instructor.

BB refers to Blackboard.

DB refers to Discussion Board

PH 75500
Course Competencies and Objectives

Program Competencies	Course Learning Objectives	Competencies
This course will help you to achieve the following competencies, which are expected of MPH graduates	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed as part of the following course assignments:
Apply the public health core functions of assessment, policy development and assurance	• Describe the role of social and community factors, including respect for individuals and communities, including sensitivity to cultural issues, in the onset and the development, implementation, and evaluation of public health strategies, programs, research, and policies as solutions of public health problems • Describe opportunities, challenges, methods of applying an evidence-based, systems approach to program planning, including the application of relevant social ecological models to public health.	• Discussion board leader • Discussion board participant • Research paper
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Identify basic theories, concepts and models from a range of social and behavioral disciplines that are used in public health research and practice. • Describe leading theories of individual, interpersonal, group, organizational, and community-level change.	• Discussion board leader • Discussion board participant • Research paper • Exams

Adhere to ethical and social justice principles and standards	• Relate contemporary public health problems to power and resource distribution, equity, diversity, sustainability, and intended and unintended consequences of interventions.	• Discussion board leader • Discussion board participant
Interpret and analyze public health literature and apply evidence-based research	• Conduct a systematic literature review of a public health issue using bibliographic databases, government statistics and other information available on the Internet	• Discussion board leader • Discussion board participant • Research paper
Communicate public health information through oral, written, digital and visual presentation	• Develop skills for writing research papers using a scholarly format by employing a critical review and synthesis of the literature on a selected public health topic	• Research paper • PowerPoint presentation
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Analyze the impact of individual, organizational, community, national, and global trends and interdependencies including, but not limited to, major economic, political, and environmental forces, that shape the health of U.S. urban populations, contribute to public health related problems, and influence systems. • Identify basic social and behavioral theories, concepts, and models that explain differences in the distribution of health and illness in the United States (including multiple perspectives on the meaning of key social concepts such as race, class, ethnicity, gender, and disability)	• Discussion board leader • Discussion board participant • Research paper • Exams
Engage and collaborate with diverse groups	• Describe the strengths	• Discussion board leader

	and limitations of social and behavior-based interventions and policies for improving the health of urban populations with an emphasis on reducing health disparities.	• Discussion board participant • Research paper

Course Expectations and Assessment

Online courses can be challenging to master in the beginning. As a first step, you MUST thoroughly review both the syllabus and the other materials available in the "Syllabus & Other Course Information" folder on Blackboard.

Technical requirements

- Access to an Internet connection with high bandwidth for streaming video, Flash and audio
- Mozilla Firefox or Microsoft Internet Explorer Internet browsers preferred
- Microsoft Office applications (Word, Excel, PowerPoint), version 2010 or later
- You may NOT use a Smartphone, tablet or any other device other than a computer to complete activities such as DB posts or exams.

The email for the student help desk is: studenthelpdesk@hunter.cuny.edu and the phone number is: 212-650-3624.

For information about BlackBoard, go to: http://www.hunter.cuny.edu/it/blackboard/student-documentation-and-support-for-blackboard

Student expectations

- Students are expected to thoroughly understand all requirements, components, and procedures of this online class by carefully reviewing the syllabus and asking questions.

- Students are expected to successfully navigate the various components of Blackboard (henceforth referred to as BB), including the Discussion Boards (henceforth referred to as DB), assignments, and exams, by dedicating an adequate amount of time (well in advance of any deadlines) to exploring the site and accessing the help resources available to them.

- Students are expected to log onto the course BB site several times a week to read announcements, retrieve and view course materials, and participate in the DBs.

- Students are expected to ensure that they have reliable and timely access to an adequate Internet connection. In other words, if your home computer crashes or Internet access fails, you will be able to use a university computer or a friend's computer to access course materials, submit postings and assignments, and take exams by the stated deadline. "My computer or Internet crashed or BB froze, so I couldn't post to the Discussion Board" is not an acceptable excuse.

Suggestions for a successful online experience

Time management is crucial in an online class. It is expected you complete all the assigned readings for each of the class sessions, and that you join each week's DB prepared to thoughtfully read, write, and learn.

Please note that this marks a significant difference from some face-to-face courses, where you might be able to fall behind on reading and catch up before exams or papers are due without your grade being affected. Staying on schedule by doing the reading will make the class more enjoyable for you, make for a better learning experience, make for livelier DBs, and improve your grade.

Assessment

The way you are assessed and graded for an online class does not differ greatly from a face-to-face class. Your grade is derived from six basic course components, which are listed below and described in the table that follows:

1. Discussion Board (DB) leader	10 points
2. DB participant (9 articles + review of 1 student PowerPoint presentation)	20 points
3. Midterm exam	15 points
4. Final exam	15 points
5. Paper	30 points
6. PowerPoint presentation based on the paper	10 points

Component	% of Grade	What is it?	Where is it?	What else should I know?
1. Discussion Board leader	10%	• As the DB leader, you must post a substantive original comment of at least 250 words and raise one open-ended question by MONDAY at 11:59pm. The criteria for DB leader points are displayed below.	• See the DB leader assignments on BB.	• Everyone will act as DB leader once. • The DB leader readings were randomly assigned by the instructor. • DB posts are formal written assignments for a graduate level course and will be graded as if you had handed in your writing on a piece of paper (e.g., in the form of an essay or research paper). • See the criteria for grading the DB leader below. • If it is impossible for you to be a DB leader on the assigned date, it is your responsibility to find a classmate to switch with you. The instructor must be informed in writing by both students that the change was made and it is acceptable to both of you. Please submit the change at least one week prior to the due date.

2. Discussion Board participant	20%	• You are responsible for commenting on 9 articles plus 1 student PowerPoint presentation. **You must choose one article each week**. Each week's post is worth a maximum of 2% of your final grade. • You must post a minimum 100-word response to the leader's post. • The criteria for the DB participant points are displayed below. • All comments are due by 11:59pm on the Sunday at the end of the session week.	• Each week's DB is located in that week's folder. The first DB is in Session 2.	• DB participant responses are formal comments appropriate for a graduate level class and will be graded as if you had submitted it in writing to the professor. • Make sure to identify which article/post you are commenting on. • See the criteria for grading the DB participant below.
3. Midterm exam	15%	• A midterm exam will be given about halfway through the semester. The exam is based on assigned readings and films, PowerPoints, and discussions. There are no exemptions from the midterm. • The exam will consist of multiple choice/true-false questions. It is timed.	• The midterm will take place on the week of the 8th session. The exam will be posted on BB.	• Further information about the exam will be posted. • The exam must be completed individually and without referring to notes or reading materials
4. Final exam	15%	• A final exam will be given at the end of the semester. The exam is based on assigned readings and films, PowerPoints, and discussions for the subjects covered after the midterm exam. There are no exemptions from the final exam. • The exam will consist of multiple choice/true-false questions. It is timed. • The final exam is not cumulative.	• The final exam will be posted below the "Course Sessions" area of BB in a folder labeled "Final Exam."	• Further information about the exam will be posted. • The exam must be completed individually and without referring to notes or reading materials

5. Library research paper	30%	• The purpose of the research paper is to give each student the opportunity to conduct an in-depth examination of the application of social theory and concepts to a health problem of interest. A list of possible topics is provided in the BB section on the research paper. • Papers are expected to be at least 10 pages (2500 words) including references. In preparation, students will submit a proposed topic description early in the semester, and a detailed outline and bibliography later on. Each paper should have a brief abstract. • All papers must be typed, double-spaced, spell-checked and proofread. Use 1-inch margins all around and 12-point font. Please follow the APA format for citing references. A useful website for information on scholarly writing styles is: <http://owl.english.purdue.edu/owl/resource/560/01/> • You must submit an electronic copy through SafeAssign on Blackboard by the due date.	• Carefully review the section on the research paper that is listed as "Research Paper" on BB.	• The completed research paper must be submitted no later than 11:59PM on May 1, 2016. • NO LATE PAPERS WILL BE ACCEPTED.

6. Research paper presentation	10%	• Each student will prepare a PowerPoint presentation based on the research paper. The presentation should contain about 10-20 slides. Make sure to include an introduction, a full description of the main topic, a summary of the literature review and suggestions for future research in the area. • You may provide narration with the Powerpoint or notes on the bottom of the page to summarize the main points of the slide. If you are showing data on the slide, your commentary or notes should summarize the data for others.		• The PowerPoint presentation is due on May 8, 2016. • NO LATE PRESENTATIONS WILL BE ACCEPTED.

IMPORTANT: LATE ASSIGNMENTS ARE NOT ACCEPTED. All DB posts must be posted in the appropriate place on BB and all exams completed by the date and time specified. **NO EXCEPTIONS.**

Discussion Board (DB) Guide for Leaders and Participants

Overview

Discussion boards are an integral part of this online course. You must post EVERY WEEK, either as a Discussion Board leader or in response to a leader's post, as a DB participant. Note that I will not be responding to every post of every thread, but I will be popping in to each DB periodically to spur conversation or give feedback.

Specific requirements

Post Requirements	Discussion Board Leader	Discussion Board Participant
Frequency	• Each student will be a DB leader once during the semester. • You must post on the date indicated in the syllabus.	• Each week there is a DB leader (9 weeks), you must select one article to post about. The last post will be a comment or response to at least one student PowerPoint presentation. • You must post by the date indicated in the syllabus.
Length and Content	• Your entry should be a minimum of 250 words (one typed page). • Discuss the main points from the specified readings. • Pose one open-ended question for participants to respond to. • The post must be free of spelling, grammatical, and punctuation errors. • You may comment on DB participants' posts.	• The post must demonstrate that you have read the article in its entirety and you must respond to the open-ended question raised by the DB leader. • You must post a minimum 100-word response to the leader's post. The post must be free of spelling, grammatical and punctuation errors.

For Full Credit	• The post was substantive and captured important points from the articles. • The open-ended question prompted a scholarly discussion of the issues. • The post was constructive and differences of opinion are expressed in a collegial manner. • The post was clearly written and organized. Grammar, spelling and punctuation count.	• The post showed ample evidence of having completed the relevant readings, as well as evidence that the participant thought about the DB leader's discussion and open-ended question. • The post was constructive and differences of opinion are expressed in a collegial manner. • The post was clearly written and organized. Grammar, spelling and punctuation count.

In addition, ALL posts should demonstrate:

Quality of Thinking: Develop, support, and convey clear, focused, and substantive ideas in ways appropriate to topic, context, audience, and purpose

Organization and Coherence: Organize writing in clear, coherent sequences, making connections and transitions among ideas, paragraphs, and sentences

Sentence Structure and Word Choice: Use and vary sentence structures and word choices to achieve clear and fluent writing

Editing: Edit for correct spelling, grammar, punctuation, capitalization, paragraph structure, sentence construction, formatting, and, when appropriate, citations

Use of Researched Information: Use, integrate, and cite researched information and evidence

Reflection: If appropriate, evaluate and articulate one's own point of view supported by research and logic

REMEMBER DB posts are formal written assignments for a graduate-level course and will be graded as if you had handed in your writing on a piece of paper (e.g., in the form of an essay or research paper).

A special DB – Questions and Comments

If you have general questions about the course or other comments, please post them on the *Questions and Comments* DB. This is a site for you to address issues that you are confused about or concerns you may have. You are not graded or evaluated on any of the posts in this section. If you have questions or are confused, chances are that other students feel similarly.

READING/ASSIGNMENT SCHEDULE & CALENDAR

This schedule, including assigned readings and due dates, is **SUBJECT TO REVISION** throughout the semester.

DB leader reviews are due on the Monday of each week.

DB participants' comments are due on the Sunday of each week.

Session	Dates	Topics	Required Readings and Multimedia Materials	Activities due by 11:59pm on due date
#1	2/1-2/7	Overview and introduction to the course.	1. National Research Council & Institute of Medicine (2013). *US Health in International Perspective: Shorter Lives, Poorer Health.* Washington, DC: The National Academies Press. Read the Summary on pages 1-9 at: http://www.nap.edu/openbook.php?record_id=13497&page=1 2. Braveman P. (2014). What are health disparities and health equity? We need to be clear. *Public Health Reports* 129: 5-8 (supplement 2). 3. Bassett M. (2015). #BlackLivesMatter — A Challenge to the Medical and Public Health Communities. *New England Journal of Medicine* 372:1085-1087. ➢ Carefully read http://library.brooklyn.cuny.edu/resources/loop/research.php?s=250&c=948 The Health and Nutrition Sciences librarian at Brooklyn College has prepared this website to assist students in conducting library research Read the entire "Public Health Loop." ➢ Review PowerPoint posted for Session 1.	• Read all the articles for this week and view the websites specified by 2/7. • Read the entire syllabus. • Make sure you understand the technology involved for the course and if you do not, contact the resources specified. • Carefully review the information about the paper. Think about your paper topic. • Introduce yourself to fellow students and the professor on the Discussion Board. DUE by 2/7/16. • Optional post to DB – Do you believe that health care is a right? Explain your answer.

#2	2/8-2/14	Introduction continued. Selected important concepts in social and behavioral sciences	1. Adler N & Stewart J. (2009). Reducing obesity: Motivating action while not blaming the victim. *The Milbank Quarterly* 87: 49-70. 2. Earnshaw V. et al. (2013). Stigma and racial/ethnic HIV disparities. *American Psychologist* 68: 225-236. 3. Grollman E. (2014). Multiple disadvantaged statuses and health: The role of multiple forms of discrimination. *Journal of Health and Social Behavior* 55: 3-19. Read only pp. 3-6; 14-16. 4. Hatzenbuehler M and Link B. (2014). Introduction to the special issue on structural stigma and health. *Social Science and Medicine* 103: 1-6. 5. Cooper et al. (2015). Calling for a bold new vision of health disparities intervention research. *American Journal of Public Health* 105 (supplement 3): s374-s376.	• DB leaders for Session 2 post discussion and open-ended question based on this week's readings. DUE on 2/8/16 • DB participant responses DUE on 2/14/16. • Submit the topic of your paper by 2/14. See the instructions under "Research Paper."

#3	2/15-2/21	Factors influencing health: Race and SES	1. Freiden TR (2010). A framework for public health action: The health impact pyramid. *American Journal of Public Health* 100: 590-595. 2. Braveman PA et al. (2011). Broadening the focus: The need to address the social determinants of health. *American Journal of Preventive Medicine* 40: S4-S18. 3. Satcher D & Higginbotham EJ (2008). The public health approach to eliminating disparities in health. *American Journal of Public Health* 98: 400-403. 4. Williams DR et al. (2010). Race, socioeconomic status, and health: Complexities, ongoing challenges, and research opportunities. *Annals of the NY Academy of Sciences* 1186: 69-101. 5. Braveman PA et al. (2011). The social determinants of health: Coming of age. *Annual Review of Public Health* 32: 381-398. 6. David R and Collins J (2014). Layers of inequality: Power, policy, and health. *American Journal of Public Health* 104: S8-S9. View the following film, "When the Bough Breaks" from *Unnatural Causes* (about 30 minutes) http://1660912-2.mediaspace.kaltura.com/media/Unnatural+CausesA+When+the+Bough+Breaks+%28Part+2%29/1_cutxz67l	• DB leaders for Session 3 post discussion and open-ended question based on this week's readings. DUE on 2/15/16. • DB participant responses DUE on 2/21/16. • Optional viewing Roberts, a legal scholar and author of *Fatal Invention: How Science, Politics, and Big Business Re-create Race in the Twenty-First Century*, examines the political and commercial incentives for continuing the categorization of people by race. http://www.pbs.org/wnet/tavissmiley/interviews/law-professor-author-dorothy-roberts/ • Optional webinar Naming and Addressing Racism: A Primer. Presented by the American Public Health Association, July 21, 2015. https://cc.readytalk.com/cc/playback/Playback.do?id=gj5zph If you view or listen to either of these optional talks, please comment on the DB for the week.

#4	2/22-2/28	Neighborhoods and health	1. Braveman PA et al. (2011). Neighborhoods and health. Robert Wood Johnson Foundation. 2. Diez Roux AV & Mair C (2010). Neighborhoods and health. *Annals of the NY Academy of Sciences* 1186: 125-145. View the following film, "Place Matters" from *Unnatural Causes* (about 30 minutes) http://1660912-2.mediaspace.kaltura.com/media/Unnatural+CausesA+Place+Matters+%28Part+5%29/1_z0na9s8b	• DB leaders for Session 4 post discussion and open-ended question based on this week's readings. DUE on 2/22/16. • DB participant responses DUE on 2/28/16.
#5	2/29-3/6	Work and health	1. Burgard SA & Lin KY (2013). Bad jobs, bad health? How work and working conditions contribute to health disparities. *American Behavioral Scientist* 57: 1105-1127.	• DB leader for Session 5 posts discussion and open-ended question based on this week's readings. DUE on 2/29/16. • DB participant responses DUE on 3/6/16.
#6	3/7-3/13	Health disparities: Gender and health	1. Rieker PP and Bird CE (2005). Rethinking gender differences in health: Why we need to integrate social and biological perspectives. *Journals of Gerontology* (Special Issue II) 60B: 40-47. 2. Rosenthal L. and Lobel M. (2011). Explaining racial disparities in adverse birth outcomes: Unique sources of stress for Black American women. *Social Science & Medicine* 72: 977-983. 3. Christopher G and Simpson P. (2014). Improving birth outcomes requires closing the racial gap. *American Journal of Public Health* 104: S10-S12.	• DB leaders for Session 6 post discussion and open-ended question based on this week's readings. DUE on 3/7/16. • DB participant responses DUE on 3/13/16.

#7	3/14-3/20	Health behaviors	1. National Cancer Institute (2005). Theory at a glance: A guide for health promotion practice. 2. Braveman P et al. (2011). What shapes health-related behavior? The role of social factors. Robert Wood Johnson Foundation. 3. Glanz K and Bishop DB (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health* 31: 399-418.	• DB leaders for Session 7 post discussion and open-ended question based on this week's readings. DUE on 3/14/16. • DB participant responses DUE on 3/20/16. • Paper outline and references due on 3/20/16. • For further information on some of the theories, you may want to view: Health Belief Model https://www.youtube.com/watch?v=6SfTbTkEozA Theory of Planned Behavior https://www.youtube.com/watch?v=DFn-lOcpd8A Transtheoretical Model of Behavioral Change https://www.youtube.com/watch?v=oO80XyBDrl0
#8	3/21-3/27	Mid-term	Further information will be provided.	Date to be announced.

#9	3/28-4/3	Social construction of illness and disease	1. Conrad P. & Barker KK (2010). The social construction of illness: Key insights and policy implications. *Journal of Health and Social Behavior* 51(S): S67-S79. 2. Cotton C. & Ridings JW (2011). Getting out/getting in: The DSM, political activism and the social construction of mental disorders. *Social Work in Mental Health* 9: 181-205. 3. Barker KK (2010). The social construction of illness. Medicalization and contested illness. Chapter in *Handbook of Medical Sociology*, 6th edition, edited by Bird CE et al.	• DB leaders for Session 9 post discussion and open-ended question based on this week's readings. DUE on 3/28/16. • DB participant responses DUE on 4/3/16.
#10	4/4-4/10	Culture and health	1. Kleinman A and Benson P. (2006). Anthropology in the clinic: The problem of cultural competency and how to fix it. *PLoS Medicine* 3 (10): 1673-1676. 2. Miner H. (1956). Body ritual among the Nacirema. *The American Anthropologist* 58: 503-507. 3. Lara M. et al. (2005). Acculturation and Latino health in the United States. *Annual Review of Public Health* 26: 367-397. 4. Castaneda H. et al. (2015). Immigration as a Social Determinant of Health. *Annual Review of Public Health* 36: 375-392.	• DB leaders for Session 10 post discussion and open-ended question based on this week's readings. DUE on 4/4/16. • DB participant responses DUE on 4/10/16.

#11	4/11-4/17	Stress, social support and health	1. Thoits PA (2010). Stress and health: Major findings and policy implications. *Journal of Health and Social Behavior* 51: S41-S53. 2. Egerter S et al. (2011). How social factors shape health: The role of stress. Robert Wood Johnson Foundation. 3. Heaney CA & Israel BA (2008). Social networks and social support. In Glanz K et al. (eds.) *Health Behavior and Health Education. Theory, Research, and Practice, 4th edition.* CA: John Wiley & Sons, Inc. 4. Umberson D et al. (2010). Social relationships and health behavior across the life course. *Annual Review of Sociology* 36: 139-157. 5. Hicken M et al. (2014). Racial/ethnic disparities in hypertension prevalence: Reconsidering the role of chronic stress. *American Journal of Public Health* 104: 117-123. Read pp. 117-118 and 121-123.	• DB leaders for Session 11 post discussion and open-ended question based on this week's readings. DUE on 4/11/16. • DB participant responses DUE on 4/17/16.

#12	4/18-5/1	Health communication and health literacy	1. Paasche-Orlow M & Wolf M. (2010). Promoting health literacy research to reduce health disparities. *Journal of Health Communication* 15: 34-41. 2. Gazmarian JA et al. (2005). Public health literacy in America. *American Journal of Preventive Medicine* 28 (3): 317-322. 3.Kutner M, Greenberg E, Jin Y and Paulsen C. (2006). The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy (NCES 2006-483). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubs2006/2006483_1.pdf Read executive summary and introduction. 4. Storey D et al. (2014). What is health communication and how does it affect the HIV/AIDS continuum of care. *Journal of Acquired Immune Deficiency Syndrome* 66 (suppl 3): S241-S249.	• DB leaders for Session 12 post discussion and open-ended question based on this week's readings. DUE on 4/18/16. • DB participant responses DUE on 5/1/16. • Paper due on 5/1/16.
#13	5/2-5/8	Student presentations	See the instructions on the "Research Paper section of BB for additional information.	• Due 5/8/16.
#14	5/9-5/15	Review, evaluations, discussion	Review the Powerpoint presentations and in the DB provide comments.	• Post comments on students' Powerpoint presentations on the DB by 5/15/16.
#15	5/16-5/22	Final exam	Further information will be provided.	• Date to be announced.

COURSE POLICIES

Attendance and class participation

This course is fully online and thus, there are no fixed meeting times. However, students are expected to fully participate on the DBs on BB and submit the assignments on the dates they are due. If you do not participate on the DB or submit your work on time, you will lose points from your final grade.

Class citizenship and rules of conduct

When communicating or completing assignments online via BB, pay attention to the following:

- Check before you post. Always check whether a similar question has been previously posted and answered on the DB.
- On DB, write in short paragraphs or use bullets to break down your ideas into smaller chunks of information. This will make your posts easier to read.
- Do not write in all uppercase. USING ALL CAPS MEANS YOU ARE SHOUTING.
- Do not use sarcasm as it often is interpreted as rude and hurtful.
- Do not edit or change someone else's message content. If you have something to add or change, add a follow-up message.
- Students in the class may come from different places around the world, so be respectful to diverse perspectives, cultures and languages.
- Be professional and engage with others respectfully.

Email correspondence

If you would like to contact me, I will respond to most questions via email. However, if you have a more substantive issue to address, please arrange to meet with me (in person or on the phone) during office hours.

When you email me, you can usually expect a response within 2 business days, sometimes sooner. Do not expect an immediate response.

Guidelines for Email

- Keep in mind that I get many emails a day. ALWAYS put "PH 75500 - [Your name]" in the subject line so that I know who the message is from and what it is in regard to.
- You are expected to conduct yourself in a professional manner in all of your interpersonal interactions, including in email. Email is a formal means of communication in the context of school or work; please sign every message at the bottom, use polite language, capital letters, punctuation, greetings and salutations. Please avoid abbreviations, slang, and cuteness.

Other forms of communication

In person: My "live" office hours at Brooklyn College for Spring 2016 are Tuesday and Thursday, 7:30 AM – 9:00 AM and 11:00 AM – 12:45 PM. On occasion, because of meetings, I am not available at 11:00-12:45. You are welcome to drop by during office hours, but to avoid long waits and the possibility that I will not be present, please make an appointment for a specific time via email.

Phone: I can also make appointments to talk with students on phone during office hours.

Please make these appointments via email. I am rarely right in front of my Brooklyn College phone (unless we have scheduled a phone meeting), and I usually only pick up phone messages during office hours, so the phone is not the most efficient way to contact me, unless you want to let me know that you are running late for a face-to-face meeting.

Help with research and writing

If you require assistance with improving your writing skills, consider visiting the Student Reading and Writing Center on the main campus. For more information, visit http://rwc.hunter.cuny.edu/

Please note: Much of your grade is dependent on clear writing (specifically, DB posts, the paper, the PowerPoint presentation). You are strongly urged to seek assistance, should you need it.

INSTITUTIONAL POLICIES

Academic integrity: Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. For more information, visit: http://www.hunter.cuny.edu/studentaffairs/student-conduct/academic-integrity/welcome-academic-integrity/?searchterm=integrity

Accessibility: Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. The Office of Disabled Students is located in Student Services, 1128 East Building, 68th Street Campus, (212) 772-4857/TTY (212) 650-3230. For more information visit: http://www.hunter.cuny.edu/studentservices/access If a student has special accommodations that are necessary for class sessions, exams or presentations, please let the instructor know at the beginning of the semester.

Library Research Paper

The purpose of the research paper is to give each student the opportunity to conduct an in-depth examination of the application of social theory and concepts to a health problem of interest. A list of possible topics is provided. You may select one of these subjects or another topic of interest. This is a library research paper. You will not be conducting interviews or collecting your own survey data.

Make sure you carefully review: http://library.brooklyn.cuny.edu/resources/loop/research.php?s=250&c=948 which was posted under the first session of the class. It is an excellent source for conducting library research in public health.

Papers are expected to be at least 10 pages (2500 words) including references. In preparation, students will submit a proposed topic description early in the semester, and a detailed outline and bibliography later on.

Each paper should have an abstract. An abstract is a brief (about 100 words) statement of the objectives, findings and conclusions of the paper. It should be provided at the beginning of the paper. It does not count toward the 10 pages specified above.

Paper deadlines -

a. Proposed topic (about one typed page): February 14 The proposed topic is not graded.
b. Paper outline and references: March 20 or earlier. Do **not** provide a narrative of the topic; you are required to submit a formal outline. The outline and references are not graded.
c. Final paper: May 1 or earlier. NO LATE PAPERS WILL BE ACCEPTED.

Although I will carefully review the topic, outline and references and offer comments, I do not read earlier drafts of the paper.

All papers must be typed, double-spaced, spell-checked, and proofread. Use 1-inch margins all around and 12-point font. Please follow the APA format for citing references.

It is your responsibility to learn and properly use the APA format. Papers that do not meet these requirements will lose points.

You should search for the most recent academic and professional journal articles on the topic. Unless there is seminal research in the subject of your paper, as a rule, do not use references earlier than 2008.

Although you may use Internet sources from the CDC or the US Department of Health and Human Services, you may not use most other non-scholarly sources. If you are uncertain about what constitutes a scholarly source, you should contact a reference librarian at the Hunter library.

It is essential that you write clearly and the paper is carefully reviewed for logical organization, spelling, grammar and punctuation. You will lose points on the paper, if it is difficult to read or understand.

You must submit a final electronic copy through SafeAssign on Blackboard, which should be labeled as **FINAL VERSION**. Prior to when the paper is due, you will be able to submit earlier versions of the paper to SafeAssign to identify areas of possible plagiarism on the paper. The earlier versions will not be read by the instructor, but rather used by you as a tool to identify plagiarism. **The final version should also be submitted to me through email.**

Plagiarism of any kind – from the Internet, books, journals, another student's paper, etc. – results in an automatic grade of 0 for the assignment. It is your responsibility to understand what plagiarism is and how to avoid it.

Possible topics for the library research paper

It is important to select a specific topic. Please note the use of "or" in the topics below. You are not limited to these subjects. Select a topic that is of special interest or importance to you and within the subject area of this course. The course readings may also give you some ideas for possible paper topics.

- Stigma about mental illness or obesity or a sexually transmitted infection
- The effect of social support on recovery from major heart surgery or a mastectomy or another medical condition
- The effect of the media on adolescent use of alcohol or tobacco
- Factors that influence teens' drug use or contraceptive use. Focus on either young women or men
- Factors that influence health care providers' attitudes and behaviors toward LGBQ patients or obese patients or self-abusing patients or patients with a mental illness
- Stress and poor birth outcomes
- Problems in communication between low-English proficiency patients and their physicians
- The effect of religion on patients' choices about end-of-life care (select a specific religion)
- The social construction of a mental disorder, ADHD, autism or female sexual dysfunction
- The effect of immigration status on health
- The factors that influence teens' attitudes and perceptions of violence
- The factors that affect body image for young girls (select a specific racial-ethnic group)
- The effect of neighborhood on women's health status
- The psychological outcomes following mastectomy or coronary bypass surgery or another major health event
- The health impact of low health literacy
- Factors associated with low health literacy
- The intersection of race and stress
- The medicalization of childbirth or menopause
- The effect of neighborhood on obesity
- The role of corporations in influencing smoking or alcohol consumption or obesity

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

Hunter College
PH 75600: Fundamentals of Health Policy & Management
3 Credits
Spring 2016

Time and location	Fully Online. The course opens on January 29th.
Instructor	Michele J. Siegel, Ph.D. Adjunct Associate Professor, Hunter College Phone: 212-744-0802 E-mail: ms1950@hunter.cuny.edu (preferred contact)
Office hours	by appointment
Course website	Students should log into the course website through their Blackboard portal: https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Examination of the organization, delivery and financing of health care in the United States as it pertains to the health policy-making process, including the organization of the agencies and personnel constituting the health care system, and analysis of government structure, laws, and regulations. Theoretical concepts, practice, and implementation of health programs in organized settings, including the planning, administration, management, evaluation, and policy analysis of public health agencies and private sector managed care.
Course prerequisites	N/A
Course format	This is a fully online course that is taught with a mix of online learning resources, narrated lectures, discussion boards, collaborative exercises and individual exercises. All materials are available on the course website. This is not a self-paced course; there are weekly deadlines for discussion and activities.
Required reading and resources	Shi L, Singh DA. (2015). Delivering Health Care in America: A systems approach (enhanced 6th edition). Sudbury, MA: Jones & Bartlett Publishers. Reid TR. (2009). The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care. Penguin Press. McDonough JE (2011). Inside National Health Reform. New

	York, NY: Milbank Memorial Fund.
Suggested reading and resources	Suggested articles are posted to Blackboard in each class folder.
Other Readings	Patient Protection and Affordable Care Act (ACA) http://www.gpo.gov/fdsys/pkg/BILLS-111hr3590enr/pdf/BILLS-111hr3590enr.pdf ACA Analysis http://healthreform.kff.org/ Health U. S. published by CDC http://www.cdc.gov/nchs/data/hus/hus12.pdf
Other sources of In Depth Information on Key Health Policy and Management Issues	The Kaiser Family Foundation: http://www.kff.org/ The Commonwealth Fund: http://www.commonwealthfund.org/ Robert Wood Johnson Foundation: http://www.rwjf.org/ The Dartmouth Atlas of Health Care: http://www.dartmouthatlas.org Families USA: http://familiesusa.org/ The Institute for Healthcare Improvement (IHI): http://www.ihi.org Agency for Healthcare Research and Quality (AHRQ): http://www.ahrq.gov/ National Committee for Quality Assurance: http://www.ncqa.org National Association of Community Health Centers: http://www.nachc.org/ US Dept. of Health and Human Services: http://www.hhs.gov/ ACA Health Insurance Marketplace: http://www.healthcare.gov/ The New York Times: www.nytimes.com (Ex: Topics- Health Care Reform) Physicians for a National Health Program www.pnhp.org

Core Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Assess the effects of political, social and economic policies on public health systems and the health of urban population's terms of effectiveness, efficiency and equity. • Discuss political and economic feasibility issues related to health policy	Discussion boards Op-Ed piece
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe evidence-based approaches in the development and evaluation of public health policies and interventions • Discuss the function and role of management and the organizational structure of public health organizations • Explain quality and performance improvement concepts employed in public health organizations	Quizzes Discussion boards
Adhere to ethical and social justice principles and standards	Explain the difference between health care systems based on market justice and those based on social justice through a comparison of the U.S. healthcare system to global health systems.	Quizzes Discussion boards Comparative health center visit
Interpret and analyze public health literature and apply evidence-based research	Prepare documents for use in legislative testimony.	Congressional testimony
Communicate public health information	• Communicate the impact of current and	Discussion boards

through oral, written, digital and visual presentation	potential policies to the lay public, advocacy groups and policy professionals.	Op-Ed piece Blog postings
Explain how social, behavioral, biomedical and environmental determinants affect population health	• Analyze the impact of individual, organizational, community, national and global trends and interdependencies on public health related problems and health disparities	Quizzes Congressional testimony
Engage and collaborate with diverse groups	Explain how professional ethics and practices relate to equity and accountability in diverse community settings.	Discussion boards Blog postings
Describe the legal foundations of the U.S. public health system and its interrelationships with other systems including health care, education and environmental protection	• Describe the legal foundation of public health and the public health policy process, including the role of each level and branch of government in assuring the health of the public • Assess the main components of, and issues related to, the organization, financing and delivery of health services and public health in the US in terms of equity, access cost and effectiveness	Quizzes
Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Describe communication, strategic planning and marketing principles related to public health activities across different settings and audiences • Investigate the role of major stakeholders including non-profit and community-based organizations in the policy process and their impact on public health	Quizzes Congressional testimony
Explain the context of public and private health-care systems in which health	• Explain the basic organization, financing and delivery of health services in the U.S.	Quizzes Congressional testimony

care and public health policy are made and healthcare is delivered	• Discuss the impact of a lack of access to health care for both individuals and society • Specify the role of public health and other governmental agencies in providing access to care for the U.S. population	

Course Assessments

Quizzes

There will be on-line multiple choice quizzes that correspond to the readings and the lectures.
These will be taken on Blackboard and must be completed in one session (e.g. once you open the quiz, you must complete it). Only one attempt will be allowed. Each quiz will be located in the class folder related to the quiz.
Class Participation and Group Discussion Boards
This class is on-line and has extensive discussion boards (which take the place of in class discussions). It is expected that the student will fully participate in the on-line portion of the course through their group discussion board and through the general class discussion board.

Op-Ed Piece

Working alone, each student will write a 500 word essay suitable for submission to a local newspaper. Students will read and respond to each other's Op-Ed pieces on Blackboard. An Op- Ed essay (those found opposite the editorial page in most newspapers) gives a point of view on an issue of importance. Detailed instructions are in the Assignment section of Blackboard.

Comparative Health Center Visit/Write Up

Go to two places that deliver health care, one public AND one private. Spend an hour or more in each, and fill out the forms given out in class, one form for each visit. Students will post to the Discussion Board one or two paragraphs about the most important differences you observed in the public and private facilities you observed. Your observation forms are due to the instructor via e-mail (a scanned PDF of your handwritten notes is fine). Detailed instructions are in the Assignment section of Blackboard.

Blog Postings

You will be directed to three specific health care blogs. You will choose one post from each of them to read and to respond to. You do not actually have to post on the blog (but you can if you want to). Your group will have a group blog. You will post a short (3-5 sentence) summary of the posts you read and your response to each blog post. Each of your responses must be 1-2 paragraphs long (no longer, no shorter) and must state an opinion. You must clearly agree or disagree with the blog, but you must state your reasons why. Spelling and grammar count. Detailed instructions are in the Assignment section of Blackboard.

Congressional Testimony Assignment

Congressional hearings are the principal method by which governmental committees collect and analyze information in the early stages of legislative policymaking. At some point in your career, you may become so proficient in your chosen area of public health that you are asked to be an expert witness at a legislative congressional hearing. Each student group will prepare a short (7-9 pages) testimony outlining a position on a given topic. Student groups will also create a one page 'summary of points' page for the other groups to be posted to Blackboard. Detailed instructions are in the Assignment section of Blackboard

Extra Credit Book Review
Students wishing to earn extra credit in the course can choose a book from the list provided and write a 3-5 page review of the book (double spaced, 12pt font, 1" margins) that focuses on how the book has increased their knowledge of public health. You may propose another book, as long as you have not already read the book. The booklist is on Blackboard

Grading

Evaluation criteria
The quizzes are objective multiple choice tests.
The written activities will be graded with a rubric. You can find the rubric for each assignment on Blackboard.
The relative weight of each course component is as follows:
Weekly quizzes 30% Participation in group discussion boards 15% Op-Ed piece 10% Comparative health center visit/write up 10% Blog Postings (3) 15% Congressional Testimony Assignment 20% Total 100% Extra Credit: Book Report 2% Posting to a health care blog online 1%
The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an

incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

Syllabus Change Policy

This syllabus is a guide for the course and is subject to change with advance notice. Changes to the syllabus will be announced in class and posted to Blackboard as an announcement.

Course Communication and Assignment Submission

This course is delivered using the Blackboard course management system. In addition, students may be required to submit course assignments from time to time to the instructor using Hunter e-mail. An active Hunter student e-mail user ID and password is required to log into both systems. An active CUNY e-mail ID is required for non-Hunter students taking the class. It is the responsibility of the student to remain current on this system.

Attendance and class participation

Class attendance in an online class is assessed by participation in the class discussion boards. Class participation is graded (15% of final grade). As such, students should read the subject material prior to participating in their group discussion board. Students are expected to post their work to their group discussion board, read the work of other students and make substantive comments.

Late/incomplete submission of assignments

This is an online course, but it is a paced course. This means that the course assignments have hard deadlines which need to be met in order for you to go forward. The deadlines will come quickly. It is really important to meet these deadlines, as the course is designed so that your fellow students are depending on you to participate. Please note that in an online course, it is almost impossible to give extensions for most assignments. Most missed assignments (such as quizzes and discussion boards) will simply result in a grade of ‘0’. The larger assignments, such as the OpEd and the Congressional Testimony, will lose 5 points per day of lateness.

Make-ups, rewrites, and extra credit

There are no make-ups or rewrites allowed. There is an extra credit book report opportunity open to all students.

Expectations of students

•Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
•Know how to use library resources and citation tools.
•Show respect to everyone in the course.
•Be fully prepared to actively participate in discussion boards.
•No credit for assignments suspected of plagiarism or cheating.
•Be held accountable for all material assigned/covered in the course.
•Regularly check the course website and official university email for course correspondence.
•Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
•Contact the professor directly with personal questions and concerns related to the course.
• When in doubt, ask questions and clarify course assignments and expectations.

Expectations for the instructor

•Provide regular announcements, reminders, and suggestions on the course website
•Monitor, ask follow-up questions, and answer questions presented during discussion
•Respond to student email within 48 hours Monday through Friday. E-mail received on Friday will be responded to on Monday.
•Grading and feedback on assignments within 2 weeks of the due date.
•Communication about grades and progress in the course will be given through the course website.

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity
Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the

CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

PH756: Public Health Policy and Management
Schedule is subject to change throughout the semester. Last Updated January 27, 2016

Date class materials will post	Topics	Materials to Read/View/Listen for the class (also check class folder on Blackboard)	Assignments Associated with this Class Module
Class 1 2/1	Overview of Health and Use of Healthcare in the U.S. Scanning the Environment	READ Shi & Singh: Chapter 1, Chapter 2 Reid TR. (2009). The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care. Penguin Press (start reading) View materials in Blackboard Class 1 Folder	Quiz 1 by 11:59PM on 2/7. Introduce yourself on the group discussion board by 11:59PM on 2/4. Op-Ed Assignment: Choose an issue. Write a one- page overview of why your chosen Op Ed issue is a problem (1-2 paragraphs) AND describe how you will 'scan the environment' about this issue (1-2 paragraphs). Post to Blackboard on the group discussion board by 11:59PM on 2/7. Read and comment on the posts of your fellow group members.
Class 2 2/8	Global Models of Healthcare Delivery	READ Reid TR. (2009). The Healing of America: A Global Quest for Better, Cheaper, and Fairer Health Care. Penguin Press (finish reading) View materials in Blackboard Class 2 Folder	Quiz 2 by 11:59PM on 2/21. Op-Ed Assignment: E-mail draft copy of Op-Ed to instructor by 11:59PM on 2/21.
2/15	President's Day - No Class		
Class 3 2/22	Health Care Policy PPACA aka ObamaCare	READ Shi & Singh: Chapter 3 McDonough JE (2012). Inside National Health Reform. California/Milbank Books on Health and the Public. Pp103-286	Quiz 3 by 11:59PM on 2/28. Moderated group discussion (2-22 to 2-28): Respond to the group discussion board question by 11:59PM on 2/26. Comment on your fellow member's postings by 2/28 at 11:59PM.

		View materials in Blackboard Class 3 Folder	
Class 4 2/29	Health Care Delivery Overview of Model Financing and Payment Private Insurance	READ Shi and Singh: Chapter 4, Chapter 6 (p195- 213) View materials in Blackboard Class 4 Folder	Quiz 4 by 11:59PM on 3/6. Op-Ed Assignment: Post final copy of Op-Ed to your group discussion board by 11:59PM on 3/6.
Class 5 3/7	Health Care Delivery Financing and Payment Public Health Insurance Medicaid, Medicare, SCHIP, VA hospitals & clinics	READ Shi and Singh: Chapter 6 (p214-237) View materials in Blackboard Class 5 Folder	Quiz 5 by 11:59PM on 3/13. Comment on other Op-Eds in your group by 11:59PM on 3/13.
Class 6 3/14	Health Care Delivery Providers Health Services Professionals Primary Care/Ambulatory Health Services	READ Shi and Singh: Chapter 7 View materials in Blackboard Class 6 Folder	Quiz 6 by 11:59PM on 3/20. Blog Post #1 to your group discussion board by 11:59PM on 3/20.
Class 7 3/21	Health Care Delivery Providers Hospitals and other Inpatient Facilities Managed Care and Integrated Organizations	READ Shi and Singh: Chapter 8, Chapter 9 View materials in Blackboard Class 7 Folder	Quiz 7 by 11:59PM on 3/27. Read and comment on the blog posts of your group members by 11:59PM on 3/27.
Class 8 3/28	QPACE: Quality Prevention Access Cost Equity Efficiency	READ Shi and Singh: Chapter 12 View materials in Blackboard Class 8 Folder	Quiz 8 by 11:59PM on 4/3. Post your 1-2 paragraph health care facility comparison summaries to the CLASS discussion board by 11:59 on 4/3. Health Care Comparison Assignment: Sheets to be e-mailed to instructor. Handwritten and scanned is fine.

Class 9 4/4	Public Health System Structure of the U.S. Government The U.S. Public Health System Federal, State and Local Health Activities	READ Scutchfield: Chap 8-10 The Federal, State and Local Contribution to Public Health View materials in Blackboard Class 9 Folder	Quiz 9 by 11:59PM on 4/10. Read and comment on at least 5 health care facility comparison summaries by 11:59PM on 4/10. Blog Post #2 posted to your group discussion board by 11:59PM on 4/10.
Class 10 4/11	Health Policy Policy Process	READ Shi & Singh: Chapter 13 View materials in Blackboard Class 10 Folder	Quiz 10 by 11:59PM on 4/17. Read and comment on the blog posts of your group members by 11:59PM on 4/17.
Class 11 4/18	Health Policy Health Policy formulation and implementation	READ McDonough pp 19-99 View materials in Blackboard Class 11 Folder	Quiz 11 by 11:59PM on 5/1. Moderated group discussion (4/18 to 5/1): Respond to the group discussion board question by 11:59PM on 4/28. Comment on your fellow member's postings by 11:59PM on 5/1.
4/25	Spring Recess – No Class		
Class 12 5/2	Management: Management of Public Health Organizations	READ Scutchfield: Chapter 15: Management of PH Organizations, Chapter 18: Leadership in PH Practice View materials in Blackboard Class 12 Folder	Quiz 12 by 11:59PM on 5/8. Blog Post #3 due posted to your group discussion board by 11:59PM on 5/8.
Class 13 5/9	Leadership Assessment and Strategic Planning Performance Assessment and Management	READ Scutchfield: Chapter 16:Performance Measurement and Management in Public Health Chapter 18: Leadership in Public Health Practice View materials in Blackboard Class 13 Folder	Quiz 13 by 11:59PM on 5/15. Read and comment on the blog posts of your group members by 11:59PM on 5/12. Leadership self-assessment/growth plan due by 11:59PM on 5/15.
Class	Student Presentations	Online Group	Congressional Testimony one-

14 5/16	Due Today	presentations of Congressional Testimony View materials in Blackboard Class 14 Folder	page review and PPT due by 11:59PM on 5/22 posted to the CLASS discussion board.
Class 15 5/23	Student Final Group Papers are Due today	View materials in Blackboard Class 15 Folder	

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PH 770.34 Adolescent Health, Development & Interventions
3 Credits
Fall 2016

Time and location	Room 331, Silberman Campus, Wednesdays 4:10 -5:55 PM
Instructor	Lynn Roberts, PhD e-mail: lroberts@hunter.cuny.edu (best way to contact) Office: Room 530, Silberman Phone: (212) 396-7742 (do not leave message)
Office hours	Mondays, 4-6 PM and by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Course explores the public health issues facing adolescents. Students will gain a broader understanding of adolescents through an examination of systems and contexts that can impact their health, development and well-being. Group problem solving strategies will be utilized to develop youth interventions based on knowledge gleaned from evidence-based prevention practice and from community members and organizations working with youth in NYC.
Course prerequisites	None
Course format	Seminar
Required reading and resources	Chase, C. *Queer 13*: *Lesbian and Gay Writers Recall Seventh Grade*. New York: William Morrow; 1998. [ISBN: 0-688-15811-0] Cox, AM. Shapeshifters: Black Girls and the Choreography of Citizenship. Durham and London: Duke University Press; 2015. [ISBN: 978-0-8223-5931-9] DiClemente R, Santelli JS, Crosby RA. (Eds.) Adolescent Health: Understanding and Preventing Risk Behaviors. San Francisco: Jossey-Bass; 2009. [ISBN #: 978-0-4701-7676-4] available on E-reserves: http://site.ebrary.com/lib/huntercollege/detail.action?docID=10308110 Frierman J, Lieberman D, Schissel A, Diller R, Kim J, and Chu Y. *Teenagers, Health Care and the Law*, 2nd Ed. New York: New York Civil Liberties Union; 2002. [available at:

	http://www.nyclu.org/files/thl.pdf] (hereafter, NYCLU) Other required materials (posted in BlackBoard): Arnett JJ. Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist* 2000; 55 (5): 469-480. Association of Maternal and Child Health Programs and National Network of State Adolescent Health Coordinators. *A Conceptual Framework for Adolescent Health*. 2005. Barry PJ, Ensign J, Lippek SH. Embracing street culture in fitting health care into the lives of street youth. *J Transcult Nursing*. 2002; 13 (2): 145-152. Bennett DL, Tonkin, RS. International developments in adolescent health care: A story of advocacy and achievement. *Jnl of Adol Health* 2003; 33: 240-251. Blum RW. Uganda AIDS prevention: A,B,C and politics. 2004; 34 (5): 428-432. Blum RW, McNeely C, Nonnemaker J. Vulnerability, risk, and protection. *Jnl of Adol Health*. 2002; 31S: 28-39. Blum RW, Mmari K. The health of young people in a global context. *Jnl of Adol Health* 2004; 35: 402-418. Blum RW, Kelly A, Ireland M. Health risk behaviors and protective factors among adolescents with mobility impairments and learning and emotional disabilities. *Jnl of Adol Health*. 2001; 28: 481-490. Catalano RF, Hawkins JD, Berglund ML, Pollard JA, Arthur MW. Prevention Science and Positive Youth Development: Competitive or cooperative frameworks? *Jnl of Adol Health*. 2002; 31: 230-239. Centers for Disease Control and Prevention. Youth risk behavior surveillance – United States, 2009. Surveillance Summaries, 2010. *MMWR* 2010; 59 (No.SS-5). (hereafter YRBS, 2009) Checkoway B, Figueroa L, Richards-Schuster K. Democracy multiplied in an urban neighborhood: Youth Force in the South Bronx." *Children, Youth and Environments* 13 (2), 2003. Available at: http://colorado.edu/journals/cye

Cotton S, Zebracki K, Rosenthal SL, Tsevat J, Drotar D. Religion/spirituality and adolescent health outcomes: A review. *Jnl of Adol Health* 2006; 38: 472-480.

Crane J. The epidemic theory of ghettos and neighborhood effects on dropping out and teenage childbearing. *American Journal of Sociology*. 1991; 96 (5): 1226-1259.

Downs DS, DiNallo JM, Savage JS, Davison KK. Determinants of eating attitudes among overweight and nonoverweight adolescents. *J Adolesc Health*. 2007;41:138–145.

Fergus S, Zimmerman MA. Adolescent resilience: A framework for understanding healthy development in the face of risk. *Annual Review of Public Health*. 2005; 26: 399-419.

Fine M, Freudenberg N, Payne Y, Perkins T, Smith K, Wanzer, K. "Anything can happen with police around": urban youth evaluate strategies of surveillance in public places. 2003. *Jnl of Social Issues*; 59 (1): 141-158.

Geneen S, Powers LE. "Tomorrow is another problem" the experiences of youth in foster care and during their transition into adulthood. *Children and Youth Services Review*. 2007; 29: 1085-1101.

Geronimus AT. Damned if you do: culture, identity, privilege, and teenage childbearing in the United States. *Soc Sci Med.* 2003; 57: 881-93.

Goldenring JM, Rosen DS: Getting into adolescent heads: An essential update. *Contemp Pediatr* 2004; 21(1): 64**.**

Guttmacher Institute. Facts on American Teens' Sexual and Reproductive Health. January 2010. Washington DC: Guttmacher Institute.

He K, Kramer E, Houser RF, Chomitz VR, Hacker KA. Defining and understanding healthy lifestyle choices for adolescents. *Jnl of Adol Health*. 2004; 35 (1): 26-33.

Jones N. "It's not where you live, it's how you live": How young women negotiate conflict and violence in the inner city. *Annals of the American Academy of Political and Social Science*. 2004; 595: 49-62.

Leventhal T, Brooks-Gunn J. The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes.

Psychological Bulletin. 2000; 126 (2): 309-327.

MacKay AP, Duran C. *Adolescent Health in the United States, 2007*. Washington DC: National Center for Health Statistics, 2007. Available at www.cdc.gov/nchs/data/misc/adolescent2007.pdf

McGillicuddy K, James T. Building youth movements for community change. *The Nonprofit Quarterly*. 2001 (8) 4.

Nuno VL, Zhang Q, Harris RB, Wilkinson-Lee AM, Wilhelm M. Smoking susceptibility among students followed from grade six to eight. *Addictive Behaviors*. 2011; 36: 1261-1266.

Park MJ, Mulye TP, et.al. The health status of young adults in the United States. *Jnl of Adol Health* 39(2006): 305-317.

Parker I. The story of a suicide. Two college room mates, a webcam, and a tragedy. *The New Yorker*. February 6, 2012. Available at: http://www.newyorker.com/magazine/2012/02/06/the-story-of-a-suicide

Petersen C (Ed) Positive development: Realizing the potential of youth. *Annals of the American Academy of Political and Social Science* 2004; 591: 202-220.

Quinn MM, Rutherford RB, Leone PE, Osher DM, Poirier JM. Youth with disabilities in juvenile corrections: a national survey. *Exceptional Children.* 2005; 71 (3): 339-345.

Roberts L. Creating a new framework for promoting the health of African-American adolescent females. *Jnl of the American Women's Medical Assoc*. 1999; 54 (3): 126-128.

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Schooler D. Real women have curves: A longitudinal investigation of TV and the body image development of Latina adolescents. *Jnl of Adol Research*. 2008; 23 (2): 132-153.

Sleet DA, Ballesteros MF, Borse NN. A review of unintentional injuries in adolescents. *Annual Review of Public Health*. 2010; 31: 195-212.
Subrahmanyan K, Greenfield P. Communicating on-line: adolescent

	relationships and the media. *The Future of Children*. 2008; 18 (1): 1-27. Tobler AL, Livingston MD, Komro KA. Racial/ethnic differences in etiology of alcohol use among urban adolescents. *Jnl of Studies of Alcohol and Drugs*. 2011; 72: 799-810. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3174025/ Tobler AL, Maldonado-Molina MM, Staras SA, O'Mara R, Livingtsone MD, Komro KA. Perceived racial/ethnic discrimination, problem behaviors and mental health among minority urban youth. *Ethn Health*. 2013; 18 (4): 337-349. Available at: http://www-ncbi-nlm-nih-gov.proxy.wexler.hunter.cuny.edu/pmc/articles/PMC3914714/ Wahl R, Cotton S, Harrison-Monroe P. Spirituality, adolescent suicide and the juvenile justice system. *Southern Medical Jnl*. 2008; 101 (7): 711-715. Walsemann KM, Bell BA. Integrated schools, segregated curriculum: Effects of within-school segregation on adolescent health behaviors and educational aspirations. *Am J Public Health.* 2010; 110 (9): 1687-1695. Waxman H. The content of federally-funded abstinence-only education programs. 2004. Washington DC: US House of Representatives Committee on Government Reform – Minority Staff Special Investigations Division. Young Wisdom Project of the Movement Strategy Center. Making Space, Making Change: Profiles of Youth-Led and Youth-Driven Organizations. 2004. Ybarra MC, Mitchell KJ. How risky are social media sites? A comparison of places on line where youth sexual solicitation and harassment occurs. *Pediatrics*. 2008; 121: e350-357. Zayas LH, Lester RJ, Cabassa LJ, Fortuna LR. Why do so many Latina teens attempt suicide? A conceptual model for research. *American Jnl of Orthopsychiatry*. 2005; 75 (2): 275-87.
Suggested reading and resources	Berger D, Boudin C, K Farrow. *Letters from Young Activists: Today's Rebels Speak Out*. New York: Avalon; 2005.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Demonstrate knowledge and understanding of MCRSH[1] as follows: 1. The major domestic and international causes of mortality and morbidity within adolescent populations including differences between the United States and other developed and less developed countries.	• Delineate the health status of adolescents with regard to the following indicators: o Major mortalities and morbidities o High risk behaviors associated with these morbidities and mortalities o Social ane environmental factors and contexts which influence the health and well-being of adolescents	• Class discussions • In class and homework assignments
2.The determinants of adolescent development, health, illness, and concomitant theories including biological, behavioral, and socio-cultural influences such as racism, sexism, and economic disparity, as well as protective factors.	• Describe theoretical models that have been useful in guiding health promotion and risk reduction programs for adolescents.	• Roundtable
Demonstrate the following MCRSH skills: 3. Describe adolescent health problems in terms of time, magnitude/severity, scope, dispersion/location, co-occurrence/co-morbidity.	• Analyze the relationship between and among environmental, social and personal factors that influence adolescent health.	• Issue Brief

[1] As per competencies developed by the Association of Teachers of Maternal and Child Health in collaboration with the MCH Council of the Association of Schools of Public Health and endorsed by the Association of Maternal and Child Health Programs (adopted 11/93; revised 6-7-96, 8/99; revisions approved by ATMCH membership 2/01).

4. Identify scientific underpinnings to determine the validity of evidence for interventions addressing adolescent health problems.	• Describe risk reduction programs targeted to adolescents. • Synthesize research and theory to develop recommendations to prevent health-related problems and promote adolescent health.	• Policy/Program Brief

Course Assessments

Your understanding of the course material will be evaluated through the following:

1) Regular attendance and active participation in all class sessions, including homework and postings in course blog.

2) Adolescent Health Issue Brief

Select a public health issue that affects adolescents and that you are interested in learning more about this semester. Research and write an individual Issue Brief addressing this particular adolescent health concern. The Issue Brief should meet the following criteria:

- Clearly define the adolescent health concern;
- Describe the magnitude of the adolescent health concern, including any recent changes in epidemiology.
- Utilize a conceptual framework to address the key determinants of the concern.
- Present any health intervention programs or policies (if any) that currently address this concern.
- Employ evidence-based literature and use only primary sources as references - a minimum of five (5) peer-reviewed journal articles.

The Issue Brief should be 1-2 pages in length.

Topics selected for the Issue Brief must be approved on or before February 10.

Assignment is **due Feb 24 via Safe Assign**. Please also bring a hard copy to class.

3) Adolescent Interview/Case Study Report

For this assignment you will be required to identify an individual between the ages of 12-20 who consents to a semi-structured "one-on-one" interview about the various facets of the individual's life. It is highly advisable to select someone with whom you do <u>not</u> have an on-going relationship in order for the adolescent to feel comfortable being open and honest and for you to enter the interview without foreknowledge or preconceptions that might bias the interview process. On the other hand, should you interview an individual who is more familiar, make note of the nature of this relationship and your reflections on its influence on the interview process (for better or worse).

The interview is expected to last between 30 minutes to an hour. You may want to audio-record the interview so you will not have to rely on notes or memory, but you will have to ask the respondent's permission to do so. Parental consent for youth under age 18 is advised.

A general outline for the interview will be provided, but it should be used as a guide. Some questions will have to be adjusted for young people who are not in school or who do not live with family members. Feel free to structure the interview as you see fit, and to depart from the list (or

order) of questions in effort to: 1) explore issues of interest to you; or to 2) pursue issues of concern or interest to your respondent.

The written report of your interview should be presented as a case study in which you attempt to describe the essential elements of this young person's health and well-being. It should not be a simple description/transcript of what the young person said; rather it should be a theoretically based assessment of this individual's life and health status.

Assignment is due **Apr 13**

5) Adolescent Health Policy or Program Brief

Develop a policy or program that recommends a strategy or strategies to prevent an adolescent health issue or promote health based on scientific evidence. When reviewing the literature and deciding on a recommendation you should:

- Critically review school, family and community programs and policies designed to prevent the health problem or promote health.
- Assess if strategies have been evaluated with rigorous research designs.
- Determine the results of these strategies. Were they effective? What does/doesn't work?

Based on your critical review of the literature and scientific evidence of what works, your policy or program must be evidence-based and supported with research. Develop a 2-4 page hand-out describing the policy or the program. Your short paper, formatted like a fact sheet (i.e., with bullet points rather than paragraphs), must include:

1. Short background about the health issue – magnitude, who is affected, severity.
2. Short review of the programs and policies that currently address the health issue – approaches, evidence about efficacy, gaps in knowledge.
3. Description of your proposed policy or program: rationale, design, intended audience, implementation, and anticipated outcomes.
4. References. There should be a minimum of 10 references, properly cited using AMA/AJPH style.

This Policy/Program Brief is **due May 18**

6) Roundtable Oral Presentation

Prepare a 10-minute presentation of your policy statement or program to be delivered informally in small groups. Also, make a copy of your hand-out for all students and the instructor (n= ##). Following your presentation, your small group will discuss the feasibility of your program or policy. Guidelines for these roundtable discussions will be provided in BlackBoard.

The Roundtable Presentation is **due May 25**.

Grading

Evaluation criteria

Describe the grading methodology that will be used to assess performance in the class. If a rubric is not used, what method will be used to evaluate graded assignments?

The relative weight of each course component is as follows:

Assessment	Weight
Attendance/Participation	10%
Issue Brief	20%
Interview	30%
Policy/Program Paper	30%
Roundtable Presentation	10%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

Course Policies

General guidance for submission of all assignments

It is expected that all writing will be of high quality, presented in a readable and consistent manner: **typewritten, double-spaced, 12 inch font, with one-inch margins all around, stapled in upper left-hand corner, with all pages enumerated and proofread.** All papers and exams should be kept to the maximum length specified. The instructor will stop reading after the maximum length and the assignment will be marked down, accordingly. A simple cover sheet with student name, title of assignment, course info, term, and date is adequate for identification purposes. Please do not submit papers in folders or binders.

Any deliberate borrowing of the ideas, terms, statements, or knowledge of others without clear and specific acknowledgment of the source is intellectual theft and is called plagiarism. It is not plagiarism to borrow the ideas, terms, statements, or knowledge of others if the source is clearly and specifically acknowledged, and quoted if appropriate. Students who consult such critical material and wish to include some of the insights, terms, or statements encountered must provide full citations in an appropriate form. All citations should follow the *Am J Public Health* style, which follows the guidelines of the American Medical Association (AMA). A style guide is provided in the Assignments section of BlackBoard.

Attendance and class participation

Timely arrival, regular attendance and *informed* participation in class discussions and exercises based on a critical reading of the assigned articles and text is required.
Students must sign up for Blackboard to receive updates, in-class materials, lectures, readings and assignments, as well as to submit assignments. For instructions on registering for Blackboard through Hunter, go to: http://bb.hunter.cuny.edu. Students should check their Blackboard related email for class announcements and assignments.

Late/incomplete submission of assignments

Papers and other assignments are due at the beginning of the class period or by the deadline specified for submitting electronically. One point will be deducted for each day an assignment is late. If a student anticipates the need to turn in work late, they must send a request via e-mail and negotiate a mutually acceptable submission plan in advance of the established due date. Students should not send an e-mail requesting an extension on the day the assignment is due**.** Students

should not miss class nor be tardy on the day an assignment is due in order to complete the assignment.

Make-ups, rewrites, and extra credit

Make-ups, re-writes or extra credit will not be accepted for any assignments.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Learn how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. Reduced credit for work completed after the due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact professor directly with personal questions and concerns related to the course.
- **On the last day of class, we will hold a dish-2-pass/pot luck to celebrate the end of the semester.** Students are expected to contribute a dish, beverage or paper goods of choice.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website.
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Preferred method of communication is email and will respond to student email within 24 hours Monday through Thursday and within 48 hours Friday- Saturday or during holiday breaks.
- Grading and feedback on assignments within 1-2 weeks of the due date.
- Communication about grades and progress in the course will be given through the course website.
- **On the last day of class, we will hold a dish-2-pass/pot luck to celebrate the end of the semester.** Students can expect the instructor to contribute a carrot cake.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located

in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

Course Schedule

Sess #	Day	Topic	Readings and Assignments
1.	Feb 3	Introduction/Overvie & the Epidemiology and Ethnography of Adolescent Health	**Cox**, Preface & Introd; **DiClemente**, Chs 1, 2; MacKay & Duran 8-41; Krieger (2005); Sleet et al (2010) WHO (2014); Blum & Mmari (2004); YRBSS, 2013 [Available at: http://www.cdc.gov/HealthyYouth/yrbs/index.htm]
2.	Feb 10	The Construction & Deconstruction of Theoretical Models of Adolescent Development	**Cox**, Chs 1& 2; **DiClemente**, Chs 3-5; **Roberts** (1999); Arnett (2000); Blum et al (2002); Fergus & Zimmerman (2005); Peterson (2004) **Notify Prof Roberts of your chosen health topic**
3.	Feb 17	Theoretical Frameworks & Approaches to Adolescent Public Health	**DiClemente**, Ch 6,7; **AMCHP** (2005); Catalano et al (2002); Goldenring (2004); He et al (2004)
Last day to drop without a "W" ~ Feb 18			
4.	Feb 24	Human & Legal Rights of Adolescents & Ethical Considerations	DiClemente, Ch 26; **NYCLU** **Adol Health Issue Briefs Due**
5.	Mar 2	NYC/NYS Adolescent Health Policies & Programs	TBA Invited Guests: NYC DOHMH, NYS DOH, ACS
6.	Mar 9	Adolescents in a Social Context Part One: Family, Peers, School and Community	**Chase**, 21-37; **DiClemente**, Ch 19, 20; Crane (1991); Leventhal & Brooks-Gunn (2000); Roche et al (2008); Walsemann & Bell (2010)
7.	Mar 16	Adolescents in a Social Context, Part Two: Youth Living on Their Own, On the Border, Under the Radar, Under Surveillance or in Custody of the State	**Cox**, Ch 5; **DiClemente**, Ch 17; Barry et al (2002); Browder (2015); Jones (2004); Fine et al (2003); Geneen & Powers (2007; **Peterson** (forthcoming) Invited Guests: James Bolas (Coalition for Homeless Youth), Liza Jessie Petersen (Artist/Writer/Educator), Joseph Toles (Foster Care Survivor/Dad), Shai Marcus (SNUG)
No class Mar 23 ~ Classes follow Friday schedule			
8.	Mar	The Margins and	Cox, Ch 4; Chase, 79-87; Berger et al (2005), pp. 85-106;

	30	Intersections of Identity, Gender & Sexuality in Adolescence & Adolescent Sexual & Reproductive Health	**DiClemente**, Ch 18; MacKay & Duran 46-55; MacKay & Duran 56-67 **Geronimus** (2003); Guttmacher (2010); Waxman Report (2004); Blum (2004); additional Guttmacher Reports available at: http://www.guttmacher.org/sections/adolescents.php Invited Guests: TBA
9.	Apr 6	Adolescent Mental/Spiritual Health & Youth with Different Abilities	**DiClemente**, Ch 13; **Fortuna** (2015) Blum et al (2001); Berger et al (2005), pp. 38-41; Cotton et al (2006); Quinn et al (2005); Zayas et al (2005); Tobler et al (2013) available at: http://www-ncbi-nlm-nihgov.proxy.wexler.hunter.cuny.edu/pmc/articles/PMC3914714/
10.	Apr 13	Adolescents Under the Influence: Alcohol, Tobacco and Other Drugs	**DiClemente**, Ch 10, 11; MacKay & Duran 42-45; Nuno et al (2011); Tobler et al (2011) available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3174025/ **Adolescent Case Study Report due**
11.	Apr 20	Adolescent Body Image, Nutrition & Food Access	**DiClemente**, Ch 9; Downs et al (2007); Rosenbaum (2007); Schooler (2008); View findings from *Project EAT* available at: http://www.sphresearch.umn.edu/epi/project-eat/project-eat-publications/
Spring Break ~ April 22 – 30			
12.	May 4	Developing Prevention & Intervention Programs for Youth	**DiClemente**, Chs 16, 24, 27; Visit: http://www.advocatesforyouth.org/for-professionals/programs-that-work Invited Guest: Advocates for Youth
13.	May 11	From Resilience to Resistance: Youth Leadership, Activism & Cultural Work	**Cox**, Ch 3; **Berger et al**. (2005), pp. 65-83 & 160-174; McGillicuddy & James (2001); Young Wisdom Project (2004) Invited Guests: TBA
14.	May 18	Adolescents On-line: Teens, Media & Technology	**DiClemente**, Ch 21, 22; Ybarra & Mitchell (2008); Parker (2012); Visit *Growing Up with Media Survey* available at: http://innovativepublichealth.org/bulletins/growing-up-with-media-methodological-details/ **Adol Policy/Program Brief due**
15.	May 25	Creating a Better World for All Our Youth	**Cox**, Epilogue; **Berger** et al (2005), pp 127-159; Bennett & Tonkin (2003) **Roundtable Oral Presentations due** **Last Class/Dish-to-Pass**

Please note: This schedule and assignments are subject to change. Additional readings may be provided. Invited Guests are also subject to change depending on availability. Check BlackBoard regularly for any updates.

CUNY School of Public Health
Hunter College

PH 77045 /Spring 2016

Communicating public health: From posters and pamphlets to holographs and hash tags

Mondays 6:00 – 7:50

DRAFT SYLLABUS

Instructors: Christina Zarcadoolas PhD and Wendy Vaughon MPH
Course meets: Silberman Building, Room
Email: czarcado@hunter.cuny.edu
Wendy.vaughon@hunter.cuny.edu

Phone: Use email
Office hours: By appointment only

REQUIRED BOOKS

Parvanta CF, Nelson DE, Parvanta SA, and Harner. RN. *Essentials of Public Health Communication*. Sudbury, MA: Jones & Bartlett Learning, 2011. **Other required materials**
Scientific journal articles and case studies will be made available via Blackboard (or other online mechanism TBD) throughout the semester.

Cialdini, Robert B., *Influence: The Psychology of Persuasion.* 5th Ed., Harper Collins Publishers, 2007.
Robert B. Cialdini (2005)

Other required readings will be taken from (partial list):

Andreasen, Alan, R. (1995) Marketing Social Change: Changing behavior to promote health, social development and the environment. CA: Jossey-Bass.

Basu, Ambar, and Mohan J. Dutta. "Sex Workers and HIV/AIDS: Analyzing Participatory Culture-Centered Health Communication Strategies." *Human Communication Research* 35.1 (2009): 86-114.

N.A. Christakis and J.H. Fowler, "Social Contagion Theory: Examining Dynamic Social Networks and Human Behavior," *Statistics in Medicine*, 32(4): 556-577 (February 2013); doi:10.1002/sim.5408

Fadiman, Anne (1999) *The Spirit Catches You and You Fall Down,* New York: Farrar, Strauss, Giroux.

Friedman, Sharon M., Sharon Dunwoody, and Carol L. Rogers, eds. (1999) *Communicating Uncertainty: Media coverage of new and controversial science*. New York: Routledge.

Marian Huhman (2010) Impacting Behavior by Integrating Health Communication and Marketing, Health Communication, 25:6-7, 617-618, DOI: 10.1080/10410236.2010.496838 **:**
http://dx.doi.org/10.1080/10410236.2010.496838

Lapinski, MK & Nwulu, P. (2008) "Can a Short Film Impact HIV-Related Risk and Stigma Perceptions? Results from an Experiment in Abuja, Nigeria". Health Communication Vol. 23, Issue 5, 2008.
http://dx.doi.org/10.1080/10410230802342093

Lakoff, George (2004). Don't think of an elephant! Berkeley: Chelsea Green Publishing.

Loader, Brian D., Ariadne Vromen, and Michael A. Xenos. "The networked young citizen: social media, political participation and civic engagement." *Information, Communication & Society* 17.2 (2014): 143-150.

Parvanta, C. (2010). Introduction to public health communication and informatics. *Essentials of Public Health Communication.* Sudbury, MA: Jones and Bartlett Learning

PEW Internet and American Life.

Parker, JC & Thorson, E. (Ed (2008). *Healthcare Communication in the New Media Landscape*. 303-322. New York, NY: Springer.

Schiavo, Renata (2007) Health Communication From Theory to Practice. SF, CA: Jossey Bass.

Wang, Xiao (2016) "To Communicate or Not to Communicate: Factors Predicting Passengers' Intentions to Ask a Driver to Stop Text Messaging While Driving". Health Communication ISSN: 1041-0236 (Print) 1532-7027 (Online) Journal homepage: http://www.tandfonline.com/loi/hhth20

Zarcadoolas, C., Pleasant, A., and Greer, D. (2005). Understanding health literacy: An expanded model. *Health Promotion International*. 20:195-203.

Zarcadoolas, C. & Pleasant, A. (2008). Health Literacy in the Digital World in Parker, JC & Thorson, E. (Ed) *Healthcare Communication in the New Media Landscape*. 303-322. New York, NY: Springer.

Zoller, H. M. (2005). Health activism: Communication theory and action for social change. *Communication Theory*, *15*(4), 341-364.

Blogs We Will Follow

Healthliteracylab.com

http://blogs.scientificamerican.com/doing-good-science/drawing-the-line-between-science-and-pseudo-science/

Pseudo Science Blog http://blogs.bu.edu/pbokulic/

The Committee for Skeptical Inquiry
http://www.csicop.org/si/show/science_and_pseudoscience_in_adult_nutrition_research_and_practice/

eSkeptic http://www.skeptic.com/eskeptic/signup/

Course Description

This course will provide a historical and contextualized understanding of public health communications and introduce both communication models and theories. The course covers the basics of design, implementation and evaluation of public health communications. Collectively this content will serve as the foundation for analyzing a wide range of modalities including: print, TV, radio, events, web-based and mobile communications. Throughout the course we will be developing skills to analyze and critique public health messaging and campaigns. The goal is for students to develop the abilities to appreciate the power of communicating effectively to promote public health goals. Case studies are used throughout this course. You may regularly finding yourself taking a picture of a health message you've seen on the subway or telling the class about an Ad you saw on the internet.

COURSE COMPETENCIES

Program Competencies	**Course Learning Objectives**	**Sessions**
Communications and informatics: the ability to collect manage and organize data to produce information and meaning that is exchanged by use of signs and symbols; to gather, process, and present information to different audiences in-person, through information technologies, or through media channels; and to strategically design the information and knowledge exchange process to achieve specific objectives. *At the end of this course the student will be able to:*		
1. Describe how societal, organizational, and individual factors influence and are influenced by public health communications.	• Understand the psychology of persuasion and how it relates to effectively communicating health information, including chronic disease prevention and safety • Learn the challenges involved in communicating public heath	1,3,4,6,7,11
2. Apply theory and strategy-based communication principles across different settings and audiences.	• Understand various theoretical models across populations in relation to health communication	3,4,6-8,11,13-15
3. Collaborate with communication and informatics specialists in the process of design, implementation, and evaluation of public health programs.	• Engage stakeholders including, but not limited to, government, community organizations and coalitions on the development and implementation of health communication campaigns	1,2,5-15
4. Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities.	• Critique an existing health communication campaign • Design and develop a health communications campaign on a single health issue	3-11
5. Use informatics methods and resources as strategic tools to promote public health.	• Become proficient in manipulating evidence and data in the design of health communication campaigns and social marketing • Identify mechanisms for obtaining consumer health information through social media	1,2,5,7
6. Use informatics and communication methods to advocate for community public health programs and policies.	• Develop persuasive messaging to sustain community change	3,4
Diversity and culture: the ability to interact with both diverse individuals and communities to produce or impact an		

intended public health outcome.		
1. Differentiate between the linguistic competence, cultural competency, and health literacy in public health practice.	• Learn to use plain language for communicating health information to the public • Effectively frame the issue across diverse cultures as well as vulnerable and underserved populations	4,6-8,11
2. Develop public health programs and strategies responsive to the diverse cultural values and traditions of the community being served.	• Become proficient in assessing community needs • Learn formative research techniques including qualitative and quantitative methods and focus group testing	5-8, 10-15

SCHEDULE

Note: This schedule and assignments are subject to change. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. You will always have at least 5 days notice if something is being changed.

Session	Date	Topic	Reading and Assignments Due	Activity
1	Feb 1 2016	Introduction to Public Health Communication From pamphlets to tweets Historical change – where it's been, where it is, where it may be going.	Parvanta, Chapters 1 & 5	Syllabus Overview Discussion of Course Project Instructors will demonstrate a critique of a health communication message or campaign Assignment to photograph a "health" message from somewhere out in public space
2	Feb 8	Functions of health communications: what is the relationship between information and behavior change? Communications Theories; how does communications work. Old and new media – converging or colliding? Ethical issues in health communications	Parvanta Chp, 5 & 6 Parvanta Chp 11 Cialdini, Chp. Goffman Basu et al. Friedman, et al.	Discuss your public health photos in class

	Feb 15	**No Class – Lincoln's Birthday**		
3	Feb 22	Where and How Does Communication Happen? Modalities- print/web/sms/broadcast/events/social networks Framing messages Film & the Arts Theories of Persuasion Advertising Film	Cialdini Chps 1 Cialdini, 2005 Parvanta, Chapter 8 & 16 Fadmin Lakoff Lapinski & Nwulu Christaikis, 2013	Final Groups Due Quiz #1
4	Feb 29	*Developing a Plan – Part 1* Who is your Audience? What do you need to know about them? Choosing a strategy specifically for your audience. Health Literacy Social Marketing Is Selling Public Health Like Selling Soap? Culture and Gender Case examinations: TB, AIDS, ACA Critiquing messages re audience	Parvanta, Chp.2 (redux) Parvanta, Chp. 7 Cialdini, Chp. 2 Andreason Schiavo Zarcadoolas et al 2008	Part 1 : Topic and Problem Statement for Communication Plan Due
5	March 7	Quiz #1 Communicating Science and Evidence Why is there so much pseudo-science around? Communicating Risk – evidence, fear and what gets communicated Technology and Health Communication eHealth/mHealth and Web 3.0	Parvanta, Chp. 4 Cialdini, Chp. 4 & 7 Parker and Thorson PEW Parvanta Chp. 3 Wang, 2016 Kim & Niederdeppe 2014	
5	March 14	Mass Media as a Public Health Strategy Getting noticed Controlling the message – Is it possible Social Marketing Social Influence Critiquing messages re modality	Parvanta, Chapter 11 Cialdini, Chp. 3 Zarcadoolas/Dresser Adult Obesity Article Loader et. al. Andreason Human	
6	March 21	*Developing a Communications Plan – Part 2* Translating good ideas into a doable communications plan; Who is involved? Building collaborators/partners	Parvanta, Chapter 2 & 10	Part 2 Final: Research for Communication Strategy Due

		How do you get and keep them involved? Early evaluation - pilot testing		
7	March 28	How do you know what works? When do you evaluate? Formative Research - qualitative methods – focus groups, usability testing, cognitive testing Evaluative Research	Parvanta, Chp. 9 & 12 (redux) Dresser et al, Public Health Detailing Article Zoller (2005)	Quiz #2
8	April 4	*Developing a Plan – Part 3* What type of community/ stakeholder participation do you have? Portfolio Class: Each student shares a project plan	Parvanta Chp 13 & 14	Part 3 Final: Open Forum Discussion Due (Draft)
9	April 11	Communicating complexity and communicating in a complex real world environment Forces – the media, pseudo-science, social networks and being ignored, just to name a few.	Cialdini, Chp. 6	
10	April 18	Quiz #2 Evaluating and Revising a Campaign		
	April 22-30	**Spring Break**		
11	May 2	Work-shopping: Rapid Communications Design in Class	Parvanta, Chapter 14 Parker and Thorson	
12	May 9	Course Review Wrap-up and Summary of Key Concepts and Themes		
13	May 16	Class Presentations		
		FINAL PAPERS DUE May 25		

Assessment

Your understanding of the course material will be evaluated through several writing and oral assignments, an individual midterm paper, a final group project and thorough class participation and discussions.

Quizzes: Two in-class quizzes will be given during the semester related to readings as well as in-class discussions. Dates March 7 and April 18.

Weekly Presentation: On the first night of class each student will be assigned a week to present a short 3-4 minute critique of a health communication message. This could range from a tweet, Instagram post, TV commercial, YouTube video, poster/pamphlet, etc. You will tell the class why or why/not you like the piece and how it relates to the night's

class. Over the course of the semester we will see that the presentations change as we learn more about communication.

Midterm (Individual Project): 6 page strict limit
More instructions will be provided in class and on BB
The Midterm and Final papers are intended to be companion pieces. The topic that you choose for the midterm will be the same throughout – the lens that you look at the communication through will differ from start to finish.

1. Choose a health communications "campaign" that has been conducted within the last 5 years in the US, ideally NY but not necessary. This campaign must have had a multidisciplinary approach (i.e. more than 1 type of dissemination (i.e., TV media, subway, twitter, print, events, etc.)
2. Collect the pieces you will be focusing on – they will appear in your Appendix
3. Analyze and present the key elements: "who (target audience), what (focus), why (public health motivation – lit review of the health problem)" of the campaign.
4. Identify and evaluate the communications strategy and approach?

The paper must be informed by readings, in-class analysis and scientific journal articles, and must be appropriately referenced in APA style. 1.5 space, Arial 11 1 inch margins.

Final Paper – Extend your look at your topic to develop your own campaign plan
More instructions will be provided in class
6 pages- strict page limit

Components of the Final Paper
Part I –Heath Topic Description
- What is the problem?
- List and map the causes of the health problem
- Target audience defense

Part II – Present research for your market strategy
- Research previous campaigns and their impact (environmental scan)
- Define/describe communication/market strategy
- Write creative brief

Part III – Strategize Barriers to Campaign Development
- Present draft concepts *only* to class (you will not be graded on artistic ability)
- Class will work together to provide suggestions and initial feedback on campaign development

Part IV – Present Final Campaign to Class
- 10 minute presentation with accompanying paper
- 5 minutes for Q & A
- Everyone must attend the last class to get credit for your final

Grading

1. Attendance and participation in class/online	**10%**
2. Quizzes	**10%**
2. Midterm (Individual)	**30%**
3. Individual presentation	**10%**
4. Final Paper	**40%**

Grading

A+	**97.5%100%**	**4.0**	**B-**	**80.0 – 82.4%**	**2.7**
A	**92.5 –97.4%**	**4.0**	**C+**	**77.5 – 79.9%**	**2.3**
A-	**90.0 –92.4%**	**3.7**	**C**	**72.5 – 77.4%**	**2.0**
B+	**87.5 - 89.9%**	**3.3**	**C-**	**70.0 – 72.4%**	**0**
B	**82.5 –87.4%**	**3.0**	**F**	**0.0 – 69.9%**	**0**

Course Policies

Attendance and participation: Students are expected to arrive to class on time, to be prepared for class, and to actively participate in class discussions. Students are responsible for class content and assignments, even if they miss a class. Excessive absences (e.g., more than one), tardiness, or lack of participation will be reflected in final grades. If a student needs to miss a class, it should be discussed with the instructor in advance or as soon as possible.

Assigned readings: All readings, for each session, must be completed by students before the class meets for that session. If students are consistently coming to class unprepared, this will be reflected in their final grade.

Submission of assignments: Assignments are due on the date indicated in the syllabus. A full grade will be deducted for each week an assignment is late. If a student anticipates the need to turn in work late, negotiate an acceptable submission plan with the instructor in advance of the established due date. In case of emergency, please contact the instructor. Assignments are to be well written (reflecting the high standards expected of graduate level work), typed, double-spaced, and proofread. Please use 1-inch margins all around and 12-point font. Use only biomedical (AMA) style for citing references; this is the style used by the *American Journal of Public Health* (AJPH). You may consult this link at the AJPH website for guidelines: http://www.ajph.org/misc/ama_references.shtml.

Blackboard and email: Students must enroll in Blackboard (Bb) online, as it will be used on a routine basis as a learning tool to distribute course materials as well as facilitate communication with the instructor and class. Students are responsible for sorting out any technical issues with respect to Blackboard enrollment with the Helpdesk or other administrative offices, as necessary. Students should also check their Hunter emails for communications about the class.

Classroom conduct: You are expected to help build a comfortable classroom environment of mutual respect, inquiry, and learning. Laptops and IPads and other electronic devices are allowed for note taking only. Text messaging, phone use, emailing, web browsing, working on assignments, cross talking, etc. are not allowed in class.

Institutional Policies

Academic honesty: Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. For more information visit: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-academic-integrity. The complete text of the CUNY Academic Integrity can be found at this site: http://www.cuny.edu/about/administration/offices/la/Academic_Integrity_Policy.pdf/

Services for disabled students: "In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. Support services and accommodations are available

to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. It is recommended that all students with documented disabilities (emotional, medical, physical, and/or learning) consult the Office of AccessABILITY to secure necessary academic accommodations. For further information and assistance, please call: (212) 772- 4857 or (212) 650-3230 or visit http://www.hunter.cuny.edu /studentservices/access

Help with research and writing: Feedback will be given on the quality of all written assignments. If you require further assistance with improving your writing skills, consider visiting the Student Reading and Writing Center at the 68th Street campus. For more, information visit http://rwc.hunter.cuny.edu/

Last day to drop the course with the grade of "W" is Nov 6, 2014. Hunter has three types of grades of withdrawal: W, WA, and WU. There may be serious academic and financial consequences associated with course withdrawal. Discuss your situation with an Advisor in the Office of Student Services, 1119 East Building, (212) 772-4882. For more information visit: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-course-withdrawal.

Incomplete grade policy: Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an INCOMPLETE is at the discretion of the instructor. Only students averaging C or above in a course are eligible to request an incomplete course grade. According to Hunter regulations, there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, a contract stating the terms and deadlines for submission of pending assignments will be signed by both the student and the instructor. The student with an INC grade will not be permitted to register for classes in the upcoming semester unless this contract is on file in the SUPH office and the instructor advises the Program Director when the incomplete has been resolved.

Grade appeals: When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. Please consult with the instructor within the first 3 weeks of the following semester. If the student is still not satisfied, he/she should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. Students have the right to request in writing that the SHS Director of the Hunter College campus appoint a student as a member to the Grade Appeals Committee. This appeal at the campus level must be submitted within the first 5 weeks of the semester following the receipt of the grade. For further guidance, please refer to the "College-wide Grade Appeals Procedures" adopted by the Senate in fall 1985. Copies of this procedure may be obtained in the Senate Office, the Office of Student Services, or departmental offices. For more information, visit: http://www.hunter.cuny.edu/studentservices/advising/policies-sub/policies-academic-appeals

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

PUBH 851 and PH 77051
Global Maternal and Child Health
3 Credits
Winter 2016

I. Overview

Time and location	Tuesday, 8:00 PM to 9:45 PM, Silberman (2180 3rd Ave), Room 331
Instructor	Jim Sherry, MD, PhD Professor, CUNY School of Public Health 2180 3rd Ave, Room 506 james.sherry@sph.cuny.edu (preferred contact)
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course will provide a framework for understanding both the theory and practice of advancing global health and in particular maternal, neonatal and child health. International systems, bilateral and multilateral initiatives and globalization trends and their effect on population health will be studied from a comparative perspective across countries and regions. The course aims at promoting an understanding the biomedical, socioeconomic and political effects of the globalization process on population health. During the semester, students will examine the emerging field of global health from an interdisciplinary perspective, by addressing the main health issues experienced by mothers and children worldwide. The course is intended for students enrolled in the DPH program, students who have completed their core requirements in the MPH program, and other advanced graduate degree programs who have an interest in global maternal and child health issues. *(This course is distinguished from PUBH 870 (Maternal, Child, Reproductive and Sexual Health in Context) in its focus on the*

	broad, global issues in the MCH field with particular emphasis on the health of children and their mothers in developing countries.)
Course prerequisites	PUBH 820 Epidemiologic Methods I Research Design and Inference PUBH 870 Maternal, Child, Reproductive and Sexual Health in Context
Course format	This course is taught with a mix of online learning resources, discussion, collaborative exercises, self-assessment, and case studies. All materials are available on the course website. This is not a self-paced course; there are weekly deadlines for discussion and activities.
Required reading and resources	See Topical Reading List (Section VII)
Suggested reading and resources	See Topical Reading List (Section VII)

II. Course Learning Objectives

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
1. Determine the status of maternal and child health ***within*** a particular country and assess the existing efforts and initiatives seeking to advance maternal and child health.	• Locate and critically assess available data/evidence on the status and health of women and children in various LMIC settings • Critically review the flow of resources that influence MNCH (financial and technical) to and among LMICs. • Critically discuss the published evaluations of large scale (country and global) initiatives influencing global MNCH	• Discussion Forum • Synthesis Assignments
2. Collect, analyze, and synthesize information about global MNCH determinants, interventions and outcomes ***across*** multiple countries in different regions.	• Locate and synthesize empirical information about international health organizations, initiatives and systems influencing global MNCH • Critically evaluate the quality of the published and gray literature on global and national level MNCH programs in LMICs • Analyze existing data/evidence (and identify gaps) on implemented or proposed global and national level MNCH programs	• Discussion Forum • Synthesis Assignments
3. Develop alternative strategies and recommendations for policy, program and systems level interventions within different epidemiologic, demographic, cultural and socioeconomic settings that can advance maternal and child health.	• Develop, compare and prioritize health sector policy and program recommendations to advance MNCH in various settings • Identify and propose major potential contributions to MNCH from outside the health sector and develop appropriate recommendations for action.	• Discussion Forum • Synthesis Assignments • Semester Paper

III. Course Assessments

Additional information about individual assignments and grading criteria can be found on the course website

Discussion Forum: Each week we will discuss the assigned learning resources. Students may be assigned the role of leader on specific topics and other students are expected to participate in the discussion.

Short Synthesis Assignments*:* The instructor will post short topical synthesis assignments for students to complete that demonstrate their achievement of the learning objectives of the particular topical areas presented and discussed.

Semester Paper**:** Students will write an analytic paper that demonstrates their ability to compare and contrast the maternal and child health status and efforts across several countries through a specific comparative lens.

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IV. Grading

a. Evaluation criteria

All assignments will be assessed based upon a rubric found on the course website. Specific information about grading criteria will be distributed with the assignment.

The relative weight of each course component is as follows:

Discussion Forum Participation	20%
Synthesis Assignments	30%
Semester Paper:	50%
	100%

The grading system for the course follows guidance in the Hunter Catalog.

Letter Grade	Quality Points	Percentage
A+	4.0	97.5 - 100
A	4.0	92.5 - 97.4
A-	3.7	90.0 - 92.4
B+	3.3	87.5 - 89.9
B	3.0	82.5 - 87.4
B-	2.7	80.0 - 82.4
C+	2.3	77.5 - 79.9
C	2.0	70.0 - 77.4
F	0	<70

b. Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course.

Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for withdrawal are available online. Only the student (not the instructor or staff) may officially withdraw from a course. Failure to officially withdraw may result in an "unofficial withdrawal" (WU), which is equivalent to a grade of F, or 0 averaged into your GPA.

c. Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor; there is no absolute right to a grade of incomplete. In the case that an incomplete grade is granted, the student must negotiate and prepare a signed contract with the instructor specifying the terms and timeline for completion of all outstanding work. Refer to the Hunter Catalog for further details.

d. Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor within the first three weeks of the following semester. If the student is still not satisfied, the student should promptly contact the Campus Director in writing giving the factual reasons and basis for the complaint. This appeal must be submitted within the first five weeks of the semester following receipt of the grade. For further guidance, refer to the Hunter Catalog.

V. Course Policies

a. Attendance and class participation

Expect to actively contribute to the discussion and complete and submit all assignments by posted due dates. Missed assignments or lack of discussion participation not only affect the individual student, but they also affect the class as a whole due to the high degree of interaction within the course. Grades for interactive communication are based on a rubric that includes the number, tone, and content of your contributions and the attitude you display towards others.

b. Late/incomplete submission of assignments

Late or incomplete assignments are not accepted.

c. Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit allowed.

d. Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.

- Complete all assignments by their assigned due date. No credit for work completed after the due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.

e. Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 24 hours Monday through Friday.
- Grading and feedback on assignments within 1 week of the due date.
- Communication about grades and progress in the course will be given through the course website.

f. Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions. Please let the instructor know at the beginning of the semester if a student has special accommodations that are necessary for class sessions, exams or presentations. The Office of AccessABILITY for Hunter College is located in Room 1214B, East Building, 695 Park Avenue, New York, NY 10065, email: AccessABILITY@hunter.cuny.edu, phone: (212) 772-4857.

g. Academic integrity

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Refer to the CUNY Policy on Academic Integrity and other sources for definitions and examples of academic dishonesty.

VI. Course Schedule

This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.

Date		Topic
2-Feb		Topic 1: In-Country Real-Time Efforts to Improve Global Maternal, Neonatal and Child Health (MNCH): Indonesia
16-Feb		Topic 2: Overview of Determinants, Resources, Proximal Determinants and Strategies to Address Global MNCH
23-Feb		Topic 3: GMNCH Policy Space and Actors
1-Mar	online	Topic 4: US Development Assistance History in GMNCH: Four Perspectives
8-Mar		Topic 5: International Organizations and Framing the MDG/SDG Transition in GMNCH
15-Mar	online	Topic 6: Evaluating Current Evidence for Progress in Addressing GMNCH
22-Mar		Topic 7: Global MNCH Interventions I
29-Mar	online	Topic 8: Global MNCH Interventions II
5-Apr		Topic 9: Addressing Vulnerability and Equity in MNCH Programs
12-Apr	online	Topic 10: Overcoming early recognition, referral and service targeting and major logistics targeting challenges in MNCH programs
19-Apr		Topic 11: Major Country Initiatives in MNCH
3-May		Topic 12: Multilateral Initiatives in MNCH: Vertical, Horizontal and Diagonal
10-May	online	Topic 13: Implementation Research and Delivery Science Initiatives in Global MNCH
17-May		Topic 14: Synthesis Roundtable and GMNCH Strategy Recommendations

VII. Reading Resources

Topic 1: In-Country Real-Time Efforts to Improve Global Maternal, Neonatal and Child Health (MNCH): Indonesia

A. Familiarize yourself with the **Joint Committee on Reducing Maternal and Neonatal Mortality in Indonesia**; Development, Security, and Cooperation; Policy and Global Affairs; National Research Council; Indonesian Academy of Sciences. Washington (DC): National Academies Press (US); 2013 Dec 26.

B. Familiarize yourself with the **Request for Information (RFI): USAID/Indonesia Maternal and Newborn Health Activity**
https://www.fbo.gov/index?s=opportunity&mode=form&id=b2cf3447b429d95b1a241396663f3e31&tab=core&_cview=0

Topic 2: Overview of Determinants, Resources, Proximal Determinants and Strategies to Address Global MNCH

A. Familiarize yourself with the **Lancet Child Survival Series**
http://www.thelancet.com/series/child-survival

B. Familiarize yourself with the **Lancet Every Newborn Series**
http://www.thelancet.com/series/everynewborn

C. Familiarize yourself with the **Lancet Maternal and Child Nutrition Series**
http://www.thelancet.com/series/maternal-and-child-undernutrition

D. Familiarize yourself with the Child Survival (basics) and the Maternal and Neonatal Mortality (basics). See CDG **Million Lives Saved Case Studies** summaries arranged by subject area (attached) or at:
http://www.cgdev.org/page/case-studies

E. Familiarize yourself with the **Global Health Media** Newborn, Childbirth and Breastfeeding training videos.
http://globalhealthmedia.org/videos/

Topic 3: GMNCH Policy Space and Actors

A. Financing Global Health 2014: Shifts in Funding as the MDG Era Closes Health Diplomacy Paper
http://www.healthdata.org/policy-report/financing-global-health-2014-shifts-funding-mdg-era-closes

B. Ski, S., Kiddell-Monroe, R. and Sherry, J. M. (2013). Is Health Diplomacy Keeping Pace with Global Health Developments? Implications for Access to Medicines Strategies in the Post-2015 MDG Framework. Journal of Health Diplomacy, 1 (1).
http://www.ghd-net.org/sites/default/files/Is%20Health%20Diplomacy%20Keeping%20Pace%20with%20Global%20Health%20Developments_0.pdf

Topic 4: US Development Assistance History in GMNCH: Four Perspectives

A. Familiarize yourself with USAID Official Website's Summary of its History
https://www.usaid.gov/who-we-are/usaid-history
B. Review the Oral Histories of USAID 'Architect': David E. Bell

David E. Bell Oral History Interview #1, 7/11/1964
http://www.jfklibrary.org/Asset-Viewer/Archives/JFKOH-DEB-01.asp

David E. Bell Oral History Interview #2, 1/2/1965
http://www.jfklibrary.org/Asset-Viewer/Archives/JFKOH-DEB-02.aspx

C. Take in a third 'independent' perspective from DEVEX, a for-profit membership organization.
https://pages.devex.com/USAID-history.html

D. Contrast the perspectives with those reflected in The Annual Gates Letter
2016: https://www.gatesnotes.com/2016-Annual-Letter
2015: https://www.gatesnotes.com/2015-annual-letter
2014: http://www.gatesfoundation.org/Who-We-Are/Resources-and-Media/Annual-Letters-List/Annual-Letter-2014
2013: http://www.gatesfoundation.org/Who-We-Are/Resources-and-Media/Annual-Letters-List/Annual-Letter-2013

Topic 5: International Organizations and Framing the MDG/SDG Transition in GMNCH

A. Familiarize yourself with the health related Sustainable Development Goals navigating (deeply) the official website of the UN describing them..
http://www.un.org/sustainabledevelopment/sustainable-development-goals/

B. Familiarize yourself with organization and (high-level) political machinery around the SDG process and where it fits into the rest of the UN.
https://sustainabledevelopment.un.org/

C. Familiarize yourself with the 'official UN SDG Document' **Transforming Our World: The 2030 Agenda For Sustainable Development A/RES/70/1**
https://docs.google.com/gview?url=http://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf&embedded=true

D. Familiarize yourself with the 'official WHO SDG Document' **Health in 2015: from MDGs to SDGs**
http://www.who.int/gho/publications/mdgs-sdgs/en/

E. BRIEFLY familiarize yourself with this website and determine how/if it is related to the UN and WHO processes and described above.
http://unsdsn.org/

F. BRIEFLY familiarize yourself with this document and determine how/if it is related to the official SDG Document' above.
Monitoring Framework for Sustainable Development Goals: Launching a data revolution for the SDGs
http://unsdsn.org/resources/publications/indicators/

Topic 6: Evaluating Current Evidence for Progress in Addressing GMNCH

1. **Navigate** the website of the **Cochrane Community** and familiarize yourself with its (relatively recent) history and efforts to bring systematic reviews of literature/evidence into the mainstream of health and medical practice.
http://community.cochrane.org/

2. **Read** the overview of the Grading of Recommendations Assessment, Development and Evaluation (**GRADE**) Working Group
   - Grading the quality of evidence and the strength of recommendations
   - *Criteria for applying or using GRADE* [pdf]

   http://www.gradeworkinggroup.org/intro.htm

3. **Review** the **U.S. Government Evidence Summit on Enhancing Child Survival and Development in Lower- and Middle-Income Countries by Achieving Population-Level Behavior Change**
   http://plbcevidencesummit.hsaccess.org/docs/public-documents/evidence-summit-process-15mar13.pdf?sfvrsn=2
   See also http://plbcevidencesummit.hsaccess.org/

4. **Read** papers #1 and # 5 and review the others making up the 6-part 2008 British Medical Journal (BMJ) series. (Note, that the online text is the longer, full version of the submitted manuscript. The pdf on BMJ's website is an abbreviated print issue version.)

   A. Guyatt GH, Oxman AD, Vist G, Kunz R, Falck-Ytter Y, Alonso-Coello P, Schünemann HJ, for the GRADE Working Group.
   Rating quality of evidence and strength of recommendations GRADE: an emerging consensus on rating quality of evidence and strength of recommendations.
   BMJ 2008;336:924-926 or [pdf]

   B. Guyatt GH, Oxman AD, Kunz R, Vist GE, Falck-Ytter Y, Schünemann HJ; GRADE Working Group.
   Rating quality of evidence and strength of recommendations: What is "quality of evidence" and why is it important to clinicians?
   BMJ. 2008 May 3;336(7651):995-8

   C. Schünemann HJ, Oxman AD, Brozek J, Glasziou P, Jaeschke R, Vist GE, Williams JW Jr, Kunz R, Craig J, Montori VM, Bossuyt P, Guyatt GH; GRADE Working Group.
   Grading quality of evidence and strength of recommendations for diagnostic tests and strategies.
   BMJ. 2008 May 17;336(7653):1106-10

   D. Guyatt GH, Oxman AD, Kunz R, Jaeschke R, Helfand M, Liberati A, Vist GE, Schünemann HJ; GRADE working group.
   Rating quality of evidence and strength of recommendations: Incorporating considerations of resources use into grading recommendations.
   BMJ. 2008 May 24;336(7654):1170-3

   E. Guyatt GH, Oxman AD, Kunz R, Falck-Ytter Y, Vist GE, Liberati A, Schünemann HJ; GRADE Working Group.
   Rating quality of evidence and strength of recommendations: Going from evidence to recommendations.
   BMJ. 2008 May 10;336(7652):1049-51

   F. Jaeschke R, Guyatt GH, Dellinger P, Schünemann H, Levy MM, Kunz R, Norris S, Bion J; GRADE working group.
   Use of GRADE grid to reach decisions on clinical practice guidelines when consensus is elusive.
   BMJ. 2008 Jul 31;337:a744

Topic 7: Global MNCH Interventions I

1. CDG Million Lives Saved Case Studies summaries arranged by subject area (attached)
   1. Child Survival Basics,

2. Maternal and Neonatal Mortality Basics,
3. Cross-Cutting Approaches Addressing the Poor and at:
http://www.cgdev.org/page/case-studies

Topic 8: Global MNCH Interventions II

1. Bennett, Sara, Ssengooba, Freddie (2010). Closing the Gaps: From Science to Action in Maternal, Newborn, and Child Health in Africa. PLoS Med 7(6): e1000298 doi: 10.1371/journal.pmed.1000298
2. Bowser, Diana, and Kathleen Hill. 2010. "Exploring Evidence for Disrespect and Abuse in Facility-Based Childbirth." TRAction Project. Harvard School of Public Health and University Research Co., LLC. http://www.tractionproject.org/sites/default/files/Respectful_Care_at_Birth_9-20-101_Final.pdf.
3. Freedman, Lynn P, Kate Ramsey, Timothy Abuya, Ben Bellows, Charity Ndwiga, Charlotte E Warren, Stephanie Kujawski, Wema Moyo, Margaret E Kruk, and Godfrey Mbaruku. 2014. "Defining Disrespect and Abuse of Women in Childbirth: A Research, Policy and Rights Agenda." Bulletin of the World Health Organization 92 (12): 915–17. doi:10.2471/BLT.14.137869.
4. Shiffman, Jeremy, and Ana Lucia Garces del Valle. 2006. "Political History and Disparities in Safe Motherhood Between Guatemala and Honduras." Population and Development Review 32 (1): 53–80. doi:10.1111/j.1728-4457.2006.00105.x.
5. Bennett, S., George, A., Rodriguez, D.C., Shiffman, J. (2015). Integrated Community Case Management: A Lens on Health Policy Processes in Sub-Saharan Africa. Health Policy and Planning 30(2) http://heapol.oxfordjournals.org/content/30/suppl_2.toc

Topic 9: Addressing Vulnerability and Equity in MNCH Programs

1. Gwatkin DR, Bhuiya A, Victora CG. (2004) Making health systems more equitable. Lancet. Oct 2-8;364(9441):1273-80. DOI: http://dx.doi.org/10.1016/S0140-6736(04)17145-6
2. Ruhago et al. (2012) Addressing inequity to achieve the maternal and child health millennium development goals: looking beyond averages. BMC Public Health , 12:1119 http://www.biomedcentral.com/1471-2458/12/1119
3. Utomo et al. Priorities and realities: addressing the rich-poor gaps in health status and service access in Indonesia. International Journal for Equity in Health 2011, 10:47 http://www.equityhealthj.com/content/10/1/47
4. Ahmed SM, Hossain A, Khan MA, Mridha MK, Alam A, Choudhury N, SherminT, AfsanaK, Bhuiya A. (2010). Using formative research to develop MNCH programme in urban slums in Bangladesh: experiences from Manoshi. BRAC. BMC Public Health; 10:663doi:10.1186/1471-2458- 10-663. http://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-10-663
5. Adams AM, Nababan HY, Hanifi SMMA (2015) Building Social Networks for Maternal and Newborn Health in Poor Urban Settlements: A Cross-Sectional Study in Bangladesh. PLoS ONE 10(4): e0123817. doi: 10.1371/journal.pone.0123817 http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0123817

Topic 10: Overcoming early recognition, referral and service targeting and major logistics targeting challenges

1. Moran, A. C., Winch, P. J., Sultana, N., Kalim, N., Afzal, K. M., Koblinsky, M., Arifeen, A., Seraji, M.H., Mannan, I., Darmstadt, G., and Baqui, A. H. (2007). Patterns of maternal care seeking

behaviours in rural Bangladesh. Tropical Medicine & International Health, 12(7), 823-832. doi: 10.1111/j.1365-3156.2007.01852.x
2. Geldsetzer P., Williams, T.C., Kirolos, A., Mitchell, S., Ratcliffe, L.A., Kohli-Lynch M.K., Bischoff, EJL., Cameron, S., and Campbell, H. (2014) The recognition of and care seeking behavior for childhood illness in developing countries: a systematic review. PLoS One 9(4). doi:10.1371/journal.pone.0093427.
3. Waiswa, P., Kallander, K., Peterson, S., Tomson, G., & Pariyo, G. W. (2010). Using the three delays model to understand why newborn babies die in eastern Uganda. Tropical Medicine & International Health, 15(8), 964-972. doi: 10.1111/j.1365-3156.2010.02557.x

Topic 11: Major Country Initiatives in MNCH

1. Rajesh K Chudasama, Am Kadri, *Pramod B Verma, Umed V Patel, Nirav Joshi, Dipesh Zalavadiya And Chirag Bhola Evaluation of Integrated Child Development Services Program in Gujarat, Indian Pediatrics 707 VOLUME 51/707 September 15, 2014 http://medind.nic.in/ibv/t14/i9/ibvt14i9p707.pdf

2. Report of the Final Evaluation, enhancing Ethiopia's Health Extension Package in Southern Nations and Nationalities People's Region (SNNPR) Shebedino and Lanfero Woredas), Save the Children, Cooperative Agreement No.: GHS-A-00-07-00023, October 1, 2007 to September 30 2012 https://ethiopia.savethechildren.net/sites/ethiopia.savethechildren.net/files/library/EVALREP-ETH-2012-04.pdf

Topic 12: Multilateral Initiatives in MNCH: Vertical, Horizontal and Diagonal (

1. Unicef Immunization http://www.unicef.org/immunization/

2. GAVI Evaluation Studies http://www.gavi.org/results/evaluations/

3. **USAID**: Acting On the Call: Ending Preventable Child and Maternal Deaths https://www.usaid.gov/actingonthecall

4. Integrated Community Case Management: A Lens on Health Policy Processes in Sub-Saharan Africa, Guest Editors: S Bennett, A George, D C Rodríguez and J Shiffman, Volume 30 suppl 2 December 2015 http://heapol.oxfordjournals.org/content/30/suppl_2.toc

    - Pamela A Juma, Karen Owuor, and Sara Bennett Integrated community case management for childhood illnesses: explaining policy resistance in Kenya Health Policy Plan. (2015) 30 (suppl 2): ii65-ii73 doi:10.1093/heapol/czv094
    - Daniela C Rodríguez, Hastings Banda, and Ireen Namakhoma Integrated community case management in Malawi: an analysis of innovation and institutional characteristics for policy adoption Health Policy Plan. (2015) 30 (suppl 2): ii74-ii83 doi:10.1093/heapol/czv063
    - Sarah L Dalglish, Pamela J Surkan, Aïssa Diarra, Abdoutan Harouna and Sara Bennett Power and pro-poor policies: the case of iCCM in Niger Health Policy Plan. (2015) 30 (suppl 2): ii84-ii94 doi:10.1093/heapol/czv064

Topic 13: Implementation Research and Delivery Science Initiatives in Global MNCH

1. Kruk ME, Yamey G, Angell SY, Beith A, Cotlear D, Guanais F, et al. (2016) Transforming Global Health by Improving the Science of Scale-Up. PLoS Biol 14(3): e1002360. doi:10.1371/journal.pbio.1002360 http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1002360
2. Peters, David H., Tran, Nhan T., Adam, Taghreed, (2013). Implementation Research in Health: A Practical Guide. Alliance for Health Policy and Systems Research, World Health Organization. http://who.int/alliance-hpsr/alliancehpsr_irpguide.pdf
3. Eccles, Martin P., Mittman, Brian S., (2006). Welcome to Implementation Science. Implementation Science 1(1): doi: 10.1186/1748-5908-1-1 http://www.implementationscience.com/content/1/1/1
4. Remme JHF, Adam T, Becerra-Posada F, D'Arcangues C, Devlin M, et al. (2010) Defining Research to Improve Health Systems. PLoS Med 7(11): e1001000. doi:10.1371/journal.pmed.1001000
5. Sanders D, Haines A (2006) Implementation research is needed to achieve international health goals. PLoS Med 3(6): e186. doi: 10.1371/journal.pmed.0030186
6. Yamey: What are the barriers to scaling up health interventions in low and middle income countries? A qualitative study of academic leaders in implementation science. Globalization and Health 2012 8:11.
7. Damschroder, Laura J., Aron, David C., Keith, Rosalind E., Kirsh, Susan R., Alexander, Jeffery A., Lowery, Julie C. (2009). Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implementation Science 4(50). doi:10.1186/1748-5908-4-50 http://www.implementationscience.com/content/4/1/50
8. Peters, David H., Adam, Adam, Tanghreed, Alonge, Olakunle, Agyepong, Akura, Tran, Nhan, (2013). Implementation Research: what it is and how to do it. BMJ 2013;347:f6753 doi: 10.1136/bmj.f6753

Topic 14: Synthesis Roundtable and GMNCH Strategy Recommendations

VIII. CDG Million Lives Saved Case Study Resources

1. Child Survival Basics

Eliminating measles in southern Africa.

Measles vaccination campaigns in seven African countries nearly eliminated measles as a cause of childhood death in southern Africa and helped reduce the number of measles cases from 60,000 in 1996 to just 117 cases four years later.

Preventing Hib disease in Chile and The Gambia.

A national Hib vaccination program in Chile reduced prevalence of Hib disease by 90 percent in the early 1990s. In 1997, The Gambia introduced Hib vaccines into its national immunization program and has virtually eliminated the disease from the country.

Preventing diarrheal deaths in Egypt.

Using modern communication methods, a national diarrheal control program in Egypt increased the awareness and use of life-saving oral rehydration therapy, helping reduce infant diarrheal deaths by 82 percent between 1982 and 1987.

Reducing child mortality through vitamin A in Nepal.

Capitalizing on the discovery that vitamin A supplementation could save child lives, the government of Nepal began the National Vitamin A Program in 1995 that has averted nearly 200,000 child deaths.

Preventing iodine deficiency disease in China.

China's introduction of iodized salt in 1995 reduced the incidence of goiter among children, from 20 to 9 percent, and created a sustainable system of private provision of fortified salt.

2. Maternal and Neonatal Mortality Basics

Saving mothers' lives in Sri Lanka.

Despite relatively low national income and health spending, Sri Lanka's commitment to providing a range of "safe motherhood" services has led to a decline in maternal mortality from 486 deaths per 100,000 live births to 24 deaths per 100,000 live births over four decades.

Reducing fertility in Bangladesh.

In Bangladesh, strong leadership of the family planning program, a sustained outreach strategy, and a focus on access to services increased contraceptive prevalence from 3 to 54 percent (and correspondingly decreased fertility from 7 to 3.4 children per woman) over two decades, far in

excess of what would have been predicted based on changes in economic and social conditions alone.

Preventing neural tube defects in Chile.
Through a successful partnership between the flour industry and the national government, Chile began fortifying wheat flour with folic acid in 2002. This intervention has prevented life-threatening neural tube defects in infants and saved the health system millions of dollars in treatment costs.

3. Cross-Cutting Approaches Addressing the Poor

Improving the health of the poor in Mexico.
Since 1997, Mexico's Progresa (now known as "Oportunidades") has provided a comprehensive package of education, health, and nutrition interventions to rural families through a conditional cash grants program, resulting in lowered rates of illness and malnutrition and increased school enrollment.

4. HIV/AIDS, Malaria and TB

Preventing HIV and sexually transmitted infections in Thailand.
In Thailand, the government's "100 percent condom program" targeting commercial sex workers and other high-risk groups helped prevent the spread of HIV relatively early in the course of the epidemic. Thailand had 80 percent fewer new cases of HIV in 2001 than in 1991 and has averted nearly 200,000 new cases.

Controlling tuberculosis in China.
To address the problem of tuberculosis (TB) patients' early dropout from treatment, a national TB program in China implemented the directly observed treatment, short-course (DOTS) approach in which a health worker "watches" patients with TB daily for six months as they take their antibiotic treatment. The program helped reduce TB prevalence by 40 percent between 1990 and 2000 and dramatically improved the cure rate in half of China's provinces.

5. Other Health Issues Also Have an Impact on Maternal and Child Health

Curbing tobacco use in Poland.
Starting in the early 1990s, the transition to a market economy and a more open society paved the way for health advocates to implement strong tobacco controls in Poland, a country that had the highest rate of tobacco consumption in the world. A combination of health education and stringent tobacco control legislation has averted 10,000 deaths a year, has led to a 30 percent

reduction in the incidence of lung cancer among men aged 20 to 44, and has helped boost the life expectancy of men by four years.

Preventing dental caries in Jamaica.
Between 1987 and 1995 Jamaica's National Salt Fluoridation Program demonstrated up to an 87 percent decrease in dental caries in schoolchildren and has been regarded as a model for micronutrient interventions.

Treating cataracts in India.
An intensified cataract surgery program implemented in seven Indian states from 1994 to 2001, which was catalyzed by technical and operational innovations developed by a nongovernmental organization, saved more than 300,000 people per year from a lifetime of blindness

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Fundamentals of Epidemiology / PHE 606

Spring 2016

TIME AND LOCATION	Tuesday, 6:00-8:40 p.m., Gillet 411
INSTRUCTOR	María Baquero, PhD, MPH Assistant Professor, Department of Health Sciences, 413 Gillet Hall
OFFICE HOURS	Thursday 11:30 am-1:30 pm or by appointment
EMAIL	maria.baquero@lehman.cuny.edu
Pre-Requisite	N/A

COURSE DESCRIPTION

Apply principles and methods of epidemiological analysis. Identify and interpret epidemiological data. Illustrate and investigate incidence, distribution, determinants, and control of disease. *3 credits.*

REQUIRED BOOKS

Aschengrau A, Seage III GR. ***Essentials of Epidemiology in Public Health***. 3rd ed. Sudbury, MA: Jones & Bartlett, 2008. A copy of the textbook will be available on reserve at the library

RECOMMENDED TEXTS

Gordis L. ***Epidemiology***. 5th ed. Philadelphia, PA: Saunders, Elsevier, 2013.
Friis R, Sellers T. ***Epidemiology for Public Health Practice***, 4th ed. Jones & Bartlett, 2009.

BLACKBOARD

The use of Blackboard is required for these classes. Blackboard will have links to assignments, required reading material and lecture slides available.

PROGRAM COMPETENCIES

This course will help you to achieve the following competencies expected of all MPH students:

1. Apply the public health core functions of assessment, policy development and assurance
2. Apply theories, concepts, models and methods to the design of public health research, policy and practice
3. Adhere to ethical and social justice principles and standards
4. Interpret and analyze public health literature and apply evidence-based research
5. Apply basic statistical and informatics techniques
6. Communicate public health information through oral, written, digital and visual presentation
7. Design and evaluate interventions to prevent or control public health problems
8. Collect, analyze and interpret public health data

CUNY

Program Competencies	**Course Learning Objectives**	**Assessment Methods**
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Apply the public health core functions of assessment, policy development and assurance	• Describe in writing the purpose of surveillance and how surveillance is used in public health practice • Explain the difference between incidence and prevalence • Describe the process of identifying and testing potential targets of intervention and give examples of effective and ineffective public health interventions • Describe the process of identifying vulnerable sub-populations, and give examples • Describe under what conditions screening is appropriate	• Class participation • Descriptive epidemiology paper • Homework assignments • Final exam
Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Describe epidemiological studies, including observational, quasi- experimental and experimental studies • Differentiate between primary and secondary data collection and identify possible sources of secondary data • Explain the difference between correlation and causation; risk factors/predictors and causes • Describe the causal inferences which can be made from experimental, quasi-experimental and observational studies using published examples	• Class participation • Descriptive epidemiology paper • Homework assignments • Journal article critique • Final exam
Adhere to ethical and social justice principles and standards	• Describe circumstances in which an experimental study would and would not be ethical • Describe major disparities in life expectancy nationally and globally	• Class participation • Homework assignments • Final exam
Interpret and analyze public health literature and apply evidence-based research	• Access and use published data to accurately describe in writing the health of populations and factors that affect health in terms of person, time and place characteristics • Distinguish between narrative and systematic reviews • Systematically review the literature on a specific topic using a PICO question	• Descriptive epidemiology paper • Journal article critique
Apply basic statistical and informatics techniques	• Explain in a few sentences the principle of screening • Define lead time and length bias and how these biases may impact screening program evaluation • Describe in a few short sentences sensitivity, specificity, positive predictive value and negative predict value of a screening test compared to a gold standard test • Calculate and interpret a mean, a proportion, a rate and an odds ratio, • Explain the difference between relative and absolute risk • Calculate age-standardized rates	• Class participation • Homework assignments • Journal article critique • Final Exam
Communicate public health information	• Describe the validity, utility and feasibility of tests used for screening and diagnosis of health conditions	• Class participation • Homework

through oral, written, digital and visual presentation	• Present visually information on key public health topics such as the major causes of death nationally and globally	assignments • Final exam
Design and evaluate interventions to prevent or control public health problems	• List the strengths and weaknesses of different techniques for evaluating interventions • List the strengths and weaknesses of different techniques for controlling public health problems	• Class participation • Descriptive epidemiology paper • Homework assignments • Journal article critique • Final exam
Collect, analyze and interpret public health data	• Explain how to choose and apply appropriate study designs to answer a research question • Explain the interpretation of different measures of population health, such as life expectancy, quality adjusted life years	• Class participation • Homework assignments • Final exam

STUDENT ASSESSMENT

Students' understanding of course material will be evaluated using the following criteria:

Assignment	Contribution to Grade
Attendance and Class Participation	15%
Critique of Journal Article	15%
Descriptive Epidemiology Paper	15%
Homework assignments (3)	30%
Final exam	25%

The following grading scheme will be applied:

A = 100 – 94	B+ = 89 – 87	C+ = 79 – 77
A - = 93 – 90	B = 86 – 84	C = 76 – 70
	B- = 83 – 80	F = 69 and below

Homework

Three homework assignments will include multiple choice and short answer questions and will consist in the practical application of concepts drawn from the readings and class lectures.

Descriptive Epidemiology Paper

Conduct a literature search on one health condition (examples will be provided) and write a 3-4 page double-spaced paper describing the epidemiology of this condition in terms of person, place and time. It should include at least 10 citations from the public health literature (peer-reviewed journals). An

ungraded bibliography will be due four weeks prior to the paper on which the instructor will provide feedback. Additional instructions on the requirements for this paper will be posted on Blackboard.

Journal Article Critique
Following an outline, write a critique of one of the two specified journal articles. The paper should be 4-6 pages typed, double-spaced.

Final Exam
The final exam will be an in-class, closed book exam. It will be cumulative and based on the material covered in class and in the readings. Students may use scientific calculators (no cell phones).

Class Attendance and Participation
Class attendance and participation is mandatory and will be scored using the following rubric:

	Strong work (3)	Needs development (2)	Unsatisfactory (1)
Active listening (3 points)	Actively and respectfully listens to peers and instructors; consistently engaged and focused.	Sometimes displays lack of interest; not entirely engaged throughout the session; occasionally checks email, instant/text messages or other non-course material during class time.	Projects lack of interest during class; apparent visible clues that s/he is not listening to peers or instructors; frequently checks email, instant/text messages or other non-course internet material during class time.
Preparation (3 points)	Arrives to class with questions about reading assignments; active involvement in the journal article breakout sessions, clearly demonstrating that s/he has read/thought about the material	Sometimes arrives unprepared or with only superficial preparation for the journal article breakout sessions	Exhibits little evidence of having read or thought about assigned material
Quality of contributions to class discussions (3 points)	Comments and asks pertinent questions frequently. Expresses thoughts clearly.	Comments and questions sometimes advance the discussion, but sometimes do little to move it forward	Thoughts are not expressed clearly; comments are often off topic; or student does not participate in class discussions
Attendance (3 points)	Arrives to class on time, does not have unexcused absences, and absent ≤ 2 times	Usually arrives to class on time; absent ≤ 2 times, but only sometimes informs instructors about unavoidable absences.	Arrives consistently late, and/or does not inform instructors about absences, or absent > 2 times.

* adapted from: http://www46.homepage.villanova.edu/john.immerwahr/TP101/EvDay/discussion%20rubric.pdf. Accessed on July 21, 2010

COURSE POLICIES

Attendance and participation
All members of the class are expected to actively participate in class lectures, activities, and discussions, and to complete assigned reading and other assigned activities prior to class. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible. Points may be deducted for absences, tardiness, or leaving class early.

Cell phones
Please do not use cell phones or laptops during the class, except during breaks.

Submission of assignments
All assignments should be submitted by the beginning of class on the assignment's due date. Papers should be no longer than the maximum length specified, and points may be deducted for exceeding the maximum length. It is expected that your writing will be of high quality, presented in a readable manner and proofread. Assignments handed in after the due date will have points deducted.

Blackboard
Please visit our Blackboard site and check your Lehman email frequently, as those will be our primary channels of communication outside of class. If you have any questions about your Lehman email address or your password, or if you have any problems accessing the site please call the computer helpdesk at 718-960-1111.

Academic Integrity
Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, cheating, plagiarizing (including "cutting and pasting" or paraphrasing information from the internet without proper citation), fabricating information or citations, facilitating acts of academic dishonesty by others, submitting work of another person or papers written for other courses, or tampering with the academic work of other students. Students may be asked to submit their notes and references to prove that their work is their own. For further clarification, please read CUNY's policy on academic integrity at http://www.lehman.edu/provost/documents/academic-integrity.pdf. Violators will be reported to the head of the Department and to the Dean of Student Affairs.

Accommodating disabilities
Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, phone number: 718-960-8441.

Academic support
At Lehman College the Instructional Support Services Program (ISSP) is home of the Academic Center for Excellence (ACE) and Science Learning Center (SLC) which provides Lehman students with academic support from peer tutors and professional staff members. The ACE provides appointment based and drop-in tutoring in the humanities, social sciences, and writing. To obtain more information about the ACE, please visit their website at http://www.lehman.edu/issp, or call them at 718-960-8175.

COURSE CALENDAR OVERVIEW

Session	Date	Lecture Topics	Lab topic
Fundamental epidemiologic concepts			
1	2/2	Introduction/Historical overview of epidemiology	*Managing data*
	2/9	**NO CLASS**	
2	2/16	Dynamics of disease transmission	*Infectious disease analysis*
3	2/23	Measures of disease occurrence	*Analysis/interpretation of cross tabulated study data*
4	3/1	Concepts of causal inference	*Considering necessary and sufficient causes*
Epidemiologic study designs			
5	3/8	Experimental studies	*Analysis/interpretation of clinical trial study data*
6	3/15	Cohort studies	*Analysis/interpretation of cohort study data*
7	3/22	Case-control studies	*Analysis/interpretation of case-control study data*
8	3/29	Cross-sectional and ecologic studies	*Analysis/interpretation of ecologic study data*
Issues in epidemiologic analysis and practice			
9	4/5	Bias	*Assessing misclassification*
10	4/11	Confounding and random error	*Assessing confounding using stratified analysis*
11	4/19	Mediation and effect measure modification	*Assessing effect measure modification using stratified analysis*
	4/26	**SPRING BREAK**	
12	5/3	Screening	*Assessing screening tools*
13	5/10	Ethics in research	
14	5/17	Exam review	
15	5/24	**Final Exam**	

READINGS AND ASSIGNMENT DUE DATES

Fundamental epidemiologic concepts	
2/2	***Session 1: Introduction/Historical overview of epidemiology*** Readings: Gordis, Ch 1 (Optional)
2/9	**NO CLASS**
2/16	***Session 2: Dynamics of disease transmission*** Readings: Gordis, Ch 2
2/23	***Session 3: Measures of disease occurrence*** Readings: Aschengrau & Seage (A&S), Ch 2: p. 33-36, 39-52 Assignment due: Bibliography for Descriptive Epi Paper
3/1	***Session 4: Concepts of causal inference*** Readings: A&S, Ch 15, p. 389-407
Epidemiologic study designs	
3/8	***Session 5: Experimental studies*** Readings: A&S, Ch 6: p. 143-149 and Ch 7: p. 173-177, 183-199 Assignment due: HW 1
3/15	***Session 6: Cohort studies*** Readings: A&S, Ch 6: p. 149-153 and Ch 8: p. 205-214, 223-229
3/22	***Session 7: Case-control studies*** Readings: A&S, Ch 6: p. 153-160 and Ch 9: p. 233-246, 248-252, 257-259 Assignment due: Descriptive epi paper
3/29	***Session 8: Cross-sectional and ecologic studies*** Readings: A&S, Ch 6 p. 161-168

Issues in epidemiologic analysis and practice	
4/5	***Session 9: Bias*** Readings: A&S, Ch 10 Assignment due: HW 2
4/11	***Session 10: Confounding and random error*** Readings: A&S, Ch 11 p. 293-302, 307-309 and Ch 12: 313-315, 318-327
4/19	***Session 11: Mediation and effect measure modification*** Readings: A&S, Ch 13
4/26	**SPRING BREAK**
5/3	***Session 12: Screening*** Readings: A&S, Ch 16: p. 417-435 Assignment due: Journal article critique paper
5/10	***Session 13: Ethics in research*** Readings: A&S, Ch 17
5/17	***Session 14: Exam review*** Readings: None Assignment due: HW 3
5/24	***Session 15: Final exam***

Prof. M. Aguirre-Molina

PUBLIC HEALTH IN CUBA SEMINAR AND STUDY TRIP

PHE 680 - TOPICS IN PUBLIC HEALTH
3 CREDITS

The Cuban Public Health System

Orientation and Seminar Meetings Location:
Graduate Center (?)

Description

SEMINAR DESCRIPTION: The correlation between low income and poor health has been well established in many countries. Yet despite Cuba's poverty, the quality of health status of the population challenges this assertion. Cuba has the same life expectancy as the U.S. and a lower infant mortality rate when compared to other countries in the region. The course reviews the Cuban health/public health system: the structure, and underlying policies and principles that create this paradox. Included is a comprehensive review and analyses of the populations' health status; the organization and delivery of care; the training of health personnel; and, the role of centralized planning. Variances between the Cuban and US systems will be addressed. During spring break students will have the option of traveling to Cuba to further explore the public health system.

STUDY TRIP: The Cuban Public Health System Seminar and Study Trip to Cuba introduce students to the Cuban Health and Public Health Systems and exposes them to alternative approaches to achieving health equity and social justice. This course seeks to ground students' understanding of contemporary Cuba within the global context. In the process, students will learn how longstanding patterns regarding race, color, class, and gender relations have evolved in(to) the socialist, and now the "post-socialist," context.

In doing so, the course attempts to:

* foster an appreciation for alternative approaches to public health practice and the need to consider broader forces and trends in seeking solutions to public health problems;
* enhance students' skills in the diagnosis and analysis of problems and solutions via applied practice through visits to Cuban health care system programs ;
* enable students to identify and analyze an approach to achieving health equity in an economic and social system as that in Cuba; and
* prepare students to develop a project that critically examines ways of developing a potential cost-effective and beneficial approach to health care system administration

Faculty & Seminar Facilitators

* **Marilyn Aguirre-Molina, EdD, MS**
Professor of Public Health/Director, CUNY Institute for Health Equity
marilyn.aguirre-molina@lehman.cuny.edu
Office: 718-960-6928

Office Hours

By appointment

Office hours are by appointment to allow for flexibility (see phone number and email). You are encouraged to meet with faculty to discuss any and all seminar related issues, assignments and questions you may have, and assistance in the selection of the final paper framework and presentation preparation. Faculty looks forward to providing assistance so that the course results in a genuine learning experience for you.
Office:

Learning Objectives

PRIMARY OBJECTIVES

1. Describe verbally and in writing some of the specific ways that the Cuban Public Health Care systems have reduced inequities in health through policies and programs

2. Discuss the unique dimensions of the Cuban Public Health and Health Care systems that are grounded on the principles of primary care and work within an integrated systems approach to assure the high level of wellness of the population

3. Demonstrate application of critical skills in discussing and analyzing the distinguishing characteristics of the Cuban system

4. Identified and analyze a systemic area of concern in U.S.-based health care system/approaches and describe potential solutions gleaned from the experiential learning achieved in observing aspects of the Cuban Public Health and Health Care systems

5. To experience Cuba directly through group cultural and social activities and individual exploration and interaction.

SECONDARY OBJECTIVES

1. To obtain a general understanding of Cuban history from colonial times to the present, with an emphasis on the period stretching from 1959 to the present;

2. To explain the root causes for and consequences of the 26th of July Movement, led by Fidel Castro, that resulted in the overthrow of Fulgencio Batista in January 1959;

3. To analyze the political, economic, social, and cultural impacts of the Revolution on Cuban society, the health of the population, as well as on the wider world;

4. To interpret primary and secondary sources from a variety of disciplines, including history, sociology, anthropology, and political science, in order to gain a deeper awareness of the trajectory of the Revolution and to fashion coherent, well-supported arguments about the historical significance of various events and trends.

ORIENTATION AND SEMINAR SCHEDULE

Orientation Session 1:

* Rayne, T. History of the Cuban Revolution.
* Peters, P. A Policy toward Cuba that serves U.S. interests. *Policy Analysis*. 2000; 384: 1-14.
* Film Portions: *Fidel*

Recommended Readings:

* Revolutionary Economic Policies

Orientation Session 2:

Pinon Vega J, Iglesias Dios JL, Torres Hernandez M. Impact of health promotion and education on the achievements of Cuban public health. *Promot Educ*. 2000;7(4): 20-4, 40, 46

Spiegel JM, Yassi A. Lessons from the margins of globalization: appreciating the Cuban health paradox. *J Public Health Policy*. 2004;25(1):85-110.

World Health Organization. Cuba's primary health care revolution: 30 years on. *Bulletin of the World Health Organization*. 2008;86(5);327-329.

Film Portions of *Salud* will be shown.

Orientation Session 3:

NOTE: Before this session all students are required to take the University required on-line course on Sexual Misconduct that can be found using the following link: (insert)

Review and discussion of University guidelines for international travel, faculty expectations, student conduct and standards.

Assessment and Grading

Your understanding of the course material will be evaluated through the following student requirements & grading (greater detail follows):

Attendance, participation in
* 3 pre-travel seminars
* Cuba participation in all de-briefing sessions, and seminar sessions for development of final paper
* 1 post-trip debriefing session: **20%**

Journal reflections on required readings, session discussions, and trip site visits (assists in development of framework and final paper): **15 %**

Cuba Paper & Poster Presentations
Concept Paper of Preliminary Area of Interest (2-3 pages): **15%**
DUE:

Final Analytic Paper (6-8 pages): **30%**
DUE:

Campus Presentation(s): **20%**
DUE: D

The final course grade will be determined using the School's letter grade system. Grades are: **A, B, C**, with **+** and **–** as applicable. Grades are defined as follows:

A Excellent. Outstanding achievement.
A- Excellent work, close to outstanding.
B+ Very good. Solid achievement expected of most graduate students.
B Good. Acceptable achievement.
B- Acceptable achievement, but below what is generally expected of graduate students.
C+ Fair achievement, above minimally acceptable level.
C Fair achievement, but only minimally acceptable.
C- Very low performance.
F Failure.
AUD Attendance credit (auditor)

PLEASE NOTE: In fairness to students who submit assignments on deadline, those who do not meet the deadline, will have a half letter grade deducted from the assignment.

Grade of incomplete – The instructor will only issue a grade of INC under the most extreme circumstances. It is preferred that students complete assignments during the

semester that the course is taken. You do not want the burden of an INC when you go on to take other course.

Grading Policy: To resolve incomplete grades, students must fulfill their obligations within one calendar year after the INC grade is assigned. After one year, an incomplete grade (''INC'') will become a permanent incomplete. Extensions will be granted only in exceptional circumstances upon written application and with the permission of the faculty member, the Executive Officer, and the Vice President for Student Affairs. Permanent incompletes will accrue no credit. Students with more than two incomplete courses will be brought to the attention of their Executive Officer to determine whether or not they are making satisfactory progress. Students will not normally be regarded as making satisfactory progress toward their degrees if they have more than two "INC"s on their records. Students should be aware that continued registration and most financial aid awards are conditional upon satisfactory progress. Students should also note that credits for which they have an "INC" as of the end of the third week of classes of a given semester are not counted toward advancement to the next level for that semester.

Course Expectations

Ownership: This is your class and your contributions to it will greatly enhance the course for all. For this reason, you are encouraged to present relevant experiences and insights, question the faculty and classmates in a thoughtful and colleague-like manner that is conductive to the group's learning, and suggest readings or activities that might enhance the course.

Class Participation: As this is a field study course, the trip activities are designed to be highly participatory, which requires that students as well as the instructors come to prepared to associated activities. The combination of required readings, presentations, and specific site visits are intended to stimulate interactive discussions during the trip meetings. Therefore, students will gain the most from this course if they come prepared to meetings and engage in discussions that are informed by the readings and associated materials.

Writing: Writing skills are absolutely essential for public health professionals. Written assignments should be used as an opportunity to sharpen and strengthen the skills you already have. Therefore, please take the time and effort to ensure that your written work is free from misspellings, typos and major grammatical errors. Additionally, students are expected to appropriately cite all references used in presentations or written materials. Work that is not clearly organized and reasonably well written will be returned for a re-write.

Assigned Readings: Course readings have been selected to provide a foundation on which meetings and activities are based. As such, to promote learning and discussion it is

necessary to keep up with the readings and associated activities that are assigned prior to meetings.

Academic integrity: Academic Dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion. Please review graduate bulletin for further detail. Additionally, the instructor will use SafeAssign in instances where there is question as to the originality of the material submitted.

Late submission of assignments - All assignments must be submitted in meeting sessions and by email on the date they are due. Late assignments will have half a letter grade deducted.

Required – CUNY Policy on Sexual Misconduct
Students traveling abroad as part of a course, must

ASSIGNMENTS

Attendance, participation and completion of project proposal sessions (20%):
As this is a field study trip, the activities are designed to be highly participatory, which requires that students as well as the instructors come to meetings prepared. The combination of required readings, presentations, and specific site visits are intended to stimulate interactive discussions during the trip meetings. Therefore, students will gain the most from this course if they come prepared to meetings and engage in discussions that are informed by the readings and associated materials. Active involvement in the debriefing sessions during the trip are expected. Early ideas for project will be discussed by each student.

Journal Reflections (15%):
Students will keep a journal as part of this field study trip. The journal should be used as a log and "idea" promoting tool. This should, in part, assist in the development of both the concept and final papers. The journal should include reflections on required readings, session discussions, and trip site visits. The journal may be written using an "informal writing" style when making the entries. The journal should be used as a core component of the course and as such should be written in on a daily basis while on the trip as well as during both planning activities and discussions related to the course. They will be submitted the week after return from field study.

Concept Paper/Preliminary Area of Interest (15%):
Students may identify and explore an area/issue of Cuban public health that interests them prior to the trip, and prepare a 2-3 page concept paper. The paper should identify the issue of special interest, why this issue is of special interest, how this will contribute to their professional development in public health, and indicate how they propose to study the issue (materials used, literature review, interviews, observations, etc.)

DUE :

Final Paper (30%):
Based on the student's topic/issue of concentration, each will prepare a well conceptualized paper that contains a substantiated discussion and analysis of issue examined as a result of the Cuba trip and experience. Please make every effort to assure that the paper is concise and the narrative pithy. Paper format and structure may vary based on issue of study. Individual meeting with faculty will provide the opportunity to discuss the format and structure of the paper.
DUE: Friday, **March15, 2012** (Late papers will have a half-letter grade deducted.)

Presentation and Poster (20%):
As part of the shared learning process, study trip participants will present the result of their experiences with their colleagues and faculty at the various CUNY campuses. Poster Session format will be used for the presentations. Details to follow.

Public Health to Cuba Seminar

SYLLABUS - SPRING

Date	Topics	Readings (to be completed prior to class), Assignments and Case Studies
November **Orientation session 1**	Introduction *Film Viewing & Discussion* *Cuba Trip Logistics & Planning Process*	READING: Required: * Rayne, T. History of the Cuban Revolution. (accessed via website) * Peters, P. A Policy toward Cuba that serves U.S. interests. *Policy Analysis*. 2000; 384: 1-14. Recommended: * Revolutionary Economic Policies
December XX **Orientation session 2**	Cuba & Healthcare *Brief History of Cuba & Healthcare* *Current Cuban Population: Health Profiles* *Current Healthcare System: Structure, Function, & Impact*	READING: Required: * Pinon Vega J, Iglesias Dios JL, Torres Hernandez M. Impact of health promotion and education on the achievements of Cuban public health. *Promot Educ*. 2000;7(4):20-4, 40, 46. * Spiegel JM, Yassi A. Lessons from the margins of globalization: appreciating the Cuban health paradox. *J Public Health Policy*. 2004;25(1):85-110. * World Health Organization. Cuba's primary health care revolution: 30 years on. *Bulletin of the World Health Organization*. 2008;86(5);327-329.

December XX **Orientation session 3**	Meet & Greet * *Final travel guidelines* * *Dinner & Mingling* * *Getting to know your fellow traveler*	*Review of CUNY Guidelines for International Travel* Discussion of special areas of interest Final Preparation for Travel and Questions
January X – January X **Field trip to Cuba** to study the public health system and learn about the economic and social aspects of Cuban life.		**Details to follow.**
PLEASE NOTE: A significant portion of the seminar is one-on-one meetings with faculty to review and discuss progress on the project, and identify additional resources to advance the student's work on the project.		
February XX	Post-Trip Debriefing & Discussion of Project	The **first** portion of the class will be devoted to a debriefing and discussion of learning experiences in Cuba. The **second** portion will be devoted to a discussion the students' proposed projects and expectations
5. March, XX	Group Discussion of Progress on Projects	Each student will provide the class an abstract of the project they are working and discuss the progress to date, and solicit feedback or suggestions from class mates on the topic.
6. March - April	One-on-one meeting with faculty.	Students will receive a calendar on which to identify the dates they will meet with faculty.

7. TBD (multiple dates)	Group Presentations	The Presentation(s): Students will prepare a Poster Session Presentation of their projects. Templates will be made available on BB.
8. May XX		Spring semester ends

Cuban Health References

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Anon. Cuba. Available at: http://www.state.gov/r/pa/ei/bgn/2886.htm.
Anon. What Cuba Can Teach Us About Health Care | Wired Science | Wired.com.: http://www.wired.com/wiredscience/2010/04/cuban-health-lessons/.
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http://midwiferytoday.com/magazine/issue61.asp

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De Vos P. "No one left abandoned": Cuba's national health system since the 1959 revolution. *Int J Health Serv*. 2005;35(1):189-207.

Drain PK, Barry M. Global health. Fifty years of U.S. embargo: Cuba's health outcomes and lessons. *Science*. 2010;328(5978):572-573.

Dresang LT, Brebrick L, Murray D, Shallue A, Sullivan-Vedder L. Family medicine in Cuba: community-oriented primary care and complementary and alternative medicine. *J Am Board Fam Pract*. 2005;18(4):297-303.

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Supplemental Readings and Resources on Cuba

Drain PK, Barry M. Global health. Fifty years of U.S. embargo: Cuba's health outcomes and lessons. *Science*. 2010;328(5978):572-573.

Community Engagement, Personal Responsibility and Self Help in Cuba's Health System Reform
Isabel P. Luis MD MS, Silvia Martínez MD PhD, Adolfo Alvarez MPH (MEDICC Review, October 2012, Vol 14, No 4)
http://www.medicc.org/mediccreview/index.php?issue=22&id=279&a=va

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Whiteford LM, Branch LG. *Primary Health Care in Cuba: The Other Revolution.* New York: Rowman & Littlefield; 2008.

The Cuban Approach to Health Care: Origins, Results, and Current Challenges - Evolution in the Revolutionary Period.

André-Jacques Neusy MD DTM&H and Bjorg Palsdottir MPA. *Roundtable: Revisiting Innovative Leaders in Medical Education* http://www.medicc.org/mediccreview/articles/mr_202.pdf

Carlos Aragonés BEng MS, Jorge R. Campos, Daniel Pérez MD MS, Alina Martínez MPharm, Jorge Pérez MD MS. *SIDATRAT: Informatics to Improve HIV/AIDS Care in Cuba* http://www.medicc.org/mediccreview/articles/mr_271.pdf

Websites

- **Cubaweb**
  www.cubaweb.cu
  This is the official site of the Cuban government. It includes news reports from the Cuban press and information on tourism, music, investment, and many other topics. In Spanish and English

- **Cuba Daily**
  http://www.cubadaily.com

- **Cuba News**
  http://groups.yahoo.com/group/CubaNews/

- **WHO – World Health Organization**
  http://search.who.int/search?q=cuban+health+&ie=utf8&site=default_collection&client=en&proxystylesheet=_en&output=xml_no_dtd&oe=utf8

Reports on the Health and Health Status of Cuba

- **MEDICC - Medical Education Cooperation with Cuba**
  This is an electronic journal/magazine published by MEDICC, the longest standing organization that collaborates with Cuba on health and medical matters. It reports on events and issues related to the Cuban health system – from medical education to innovations, and events in Cuba.
  http://medicc.org/ns/

- **U.S. State Department Website on Cuba**
  www.state.gov/www/regions/wha/cuba/index.html
  This site helps U.S. citizens to understand the rules and regulations of travel to Cuba, the U.S. embargo against the island and related issues.
  http://travel.state.gov/cuba.html
  Consular Information Sheet on Cuba including travel advisories.

- **Alpha66**
  http://www.alpha66.org
  Website of the major exile groups, devoted to the fight against the demise of communism in Castro's Cuba.

- **Cuba American National Foundation**
  http://www.canfnet.org
  Website devoted to the counter-revolution, defined as working toward the advancement of freedom and democracy in Cuba

- **Cubanet**
  www.cubanet.org

  This site is operated by Cuban exiles in Miami. "Committed to the free press in Cuba, Cubanet disseminates the non-governmental information that emanates from the Island and presents the full spectrum of opinions about Cuba's reality."

- **AfroCuba**
  www.afrocubaweb.com
  This site is devoted to preserving and promoting Afrocuban culture

- **Lonely Planet**
  http://www.lonelyplanet.com/destinations/caribbean/cuba/

THE CUNY SCHOOL OF PUBLIC HEALTH & HEALTH POLICY

PHE 703: Social and Behavioral Determinants of Health

Spring 2016

Catalogue description:	**Overview of social and behavioral aspects of health, the influence of social and behavioral factors in the distribution of health and illness among populations, and emphasis on how social science theory informs public health. Based on a social ecological perspective, this course offers an introduction to major theories of behavior change in health promotion, with a focus on applications to public health programs.**
Course meets:	Monday, 6:00 pm – 8:40 pm Gillet Hall - Room 430
Instructor:	Dr. Marilyn Aguirre-Molina, Professor
Email:	Marilyn.aguirre-molina@lehman.cuny.edu
Phone:	(718) 960-6928 or (917) 731-4323
Office:	Gillet 422
Office hours:	Monday and Tuesday, 4:00 pm – 6:00 pm
Texts & Readings:	Or by appointment to meet student's need. I encourage you to meet with me to discuss any and all course related issues, assignments and questions you may have. I look forward to providing assistance so that the course results in a genuine learning experience for you. Instead of a text, the class will be using the following free report for the National Academies of Science (NAS): **Health & Behavior – The Interplay of Biological, Behavioral, and Societal Influences -2001** The free report can be obtained via link in BlackBoard (BB) under content in the labeled folder. There will also be readings from selected journal articles, and other documents. Links to the readings are available on the syllabus or posted on BlackBoard.

Competencies and Learning Objectives

Program Competencies	Course Learning Objectives
This course will help you to achieve the following competencies, which are expected of all MPH graduates	After successfully completing this course, you are expected to be able to:
1. Apply the core functions of PH practice (assessment, policy development, and assurance)	• Analyze the impact of individual, organizational, community, national, and global trends and interdependencies on public health related problems and systems. • Identify beliefs, assets, and needs at the individual, interpersonal, organization, community, and policy levels that inform public health interventions. • Assess opportunities and challenges of applying a systems approach to addressing public health problems.
2. Understand basic theories, concepts, models and methods from a range of core and related disciplines and apply them to the design of PH research, policy, and practice	• Identify basic social and behavioral theories, concepts, and models that explain differences in the distribution of health and illness in the United States (including multiple perspectives on the meaning of key social concepts such as race, class, ethnicity, gender, and disability). Describe leading theories of individual, interpersonal, group, organizational, and community-level change. Describe the strengths and limitations of social and behavior-based interventions and policies for improving the health of urban populations. • Identify strategies to reduce disparities in health.
3. Apply ethical and social justice principles and standards	• Describe elements which characterize respect for individuals and communities, including sensitivity to cultural issues, when developing, implementing, and evaluating public health strategies, programs, research, and policies.
4. Interpret and apply the PH literature.	• Retrieve relevant materials, summarize and identify a topic for further exploration over the semester.

	• Find conflicting interpretations of the same phenomenon and use examples to support your case. • Research various intervention strategies to address a specific PH problem
6.Communicate PH information verbally and in writing	Diagnose strengths and problems of urban communities. Identify organizations that can play a role in health promotion and disease prevention within urban communities. Assess available resources for health promotion and disease prevention within urban communities. Describe the roles of various systems (e.g. schools, health care, environmental protection, criminal justice, food and nutrition) in promoting health and preventing disease among urban populations.
7. Explain key social, behavioral, biomedical and environmental determinants of and inequities in health and disease across the lifespan in urban settings	• Describe specific pathways by which urban living affects health across the lifespan. • Identify major economic, political, and environmental forces that shape the health of U.S. urban populations.
	• Describe the influence of behavioral, interpersonal, community, economic, sociocultural, and policy factors on health behaviors and health. • Assess the cultural beliefs of various urban populations and describe their impact on health and disease. • Analyze the impact of class, race, ethnicity, gender and sexual preference on the health status and needs of urban populations.

Assessment

Your understanding of the course material will be evaluated through the following:

Attendance and Class Participation:

Attendance - **5% of total grade**

It will be taken at the beginning of each class. It's more difficult to grasp course content and gain knowledge if you're not in class.

Class Readings and Participation - **10% of the total grade**

It is essential that students remain current with assigned readings. At the start of each, there will be a discussion asking students the primary "take away" from the readings that week. This entails reading the material and identifying the key issue that captured your attention, and why.

Students are required to participate in class and group discussions. Participation includes responding to questions posed by the professor but also responding to comments made by fellow students. The aim of class discussions is to create a discussion between students, not a discussion between the student and professor. Your class participation will be scored using the Participation Rubric attached to syllabus.

Exam – **15% of total grade**

The exam will cover all class lectures, readings and related discussion up until the date of the exam. The focus of the exam will be on theories of social and behavioral health. The exam will be a multiple choice and short essay format. **Exam Date: March 14th**

Public Health News Watch - 25% of total grade

A. Paper – 20%

This semester you are required to read or listen to **popular news media** such as newspapers, magazine, blogs, journals, and other news sources. The primary focus of the media platform is a health/public health topic. Identify the news item and write a discussion/critique paper. Include a copy of, or link to the article; visual images should be included in the paper (3 – 4 pages, 1.5 line spacing)

Do not summarize the news item. Address the questions and discussion points listed below. The discussion should include:

- Source of news item, date, if it is a published article include page number
- Indicate if sources of information/data are cited from a published scientific article, or other source of information/data used.
- Discuss how the article relates to public health.
- Was it directed at a particular audience or a general audience?

- How are social and behavioral factors conveyed/discussed in the item? If they are not discussed – should they have been included?
- Critique the news item itself:
    - Was the information accurate and based on a reliable source?
    - Was it credible and believable?
    - Was it well written and interesting?
    - Did it adequately address the issue?
    - Was key information is missing?
- Summarize your overall assessment of the article, and identify if it contribute to health improvements of populations, explain why or why not

B. Presentation- 5%

Student will make a 10 minute presentation of findings in a PowerPoint presentation to the class. The Template for the PP will be provided on BB. **Due: April 18th**

Survey of Public Awareness and Knowledge of Public Health Policies in Action – 40% of grade

In teams of three, students will conduct a convenience survey to identify public awareness of public health policies, and determine if groups of individual understand the intent of the policy. The teams may want to assess policies such as, Restaurant Letter Ratings, Menu Calorie Labeling, CUNY's Tobacco Free Policy, etc. The process will entail the following:

1 – identify a hypothesis/research question

2- identify population and site where to collect information

3 – develop and test the survey questionnaire

4 – develop a data collection strategy (when, where, who, incentives, analysis, timetable)

5 – collect, enter and analyze the survey data obtained (any program can be used for analysis can be employed

6 – organize findings

7 – Prepare report – details

8 – Brief presentations will be made in class **Due: May 23rd**

Student Grading

GRADING	
5%	Attendance
10%	Participation
15%	Exam
20% 5%	Public Health News Watch Paper Presentation
100%	

Course Policies & Expectations

Ownership - This is your class and your contributions to it will greatly enhance the course for all. For this reason, you are encouraged to question your instructor and classmates in a thoughtful and colleague-like manner that is conductive to the group's learning.

Attendance & Class Participation - Your attendance is crucial to the effectiveness of this course and to your overall grade. If you must be late or absent please call or email me prior to the class. This course is designed to be highly participatory, which requires that students as well as the instructor come to class prepared. The combination of required readings, instructor presentations, guest lecturers, and field visits is intended to stimulate interactive discussions during the class meetings. Therefore, students will gain the most from this course if they come prepared to class and engage in discussions that are informed by the readings.

Students are expected to demonstrate evidence of preparation by engaging in discussions, raising questions, and participating in exchanges with classmates that are relevant and related to the readings, lectures and course assignments.

Assigned Readings - Course readings have been selected to provide a foundation on which class sessions and lectures are based. As such, to promote in class learning and discussion it is necessary to keep up with the readings that are assigned each week. If you have not read the week's assignment, it will not be possible to participate in the class discussion.

Submission of assignments - All assignments must be submitted by email to the instructor on the date they are due (before class). Late assignments will have will have 2 points deducted.

Extra credit - There is not an extra credit option for this course. Students' grades are based on the assignments and expectations described in the syllabus.

Grade of incomplete – The instructor will only issue a grade of INC under the most extreme circumstances. It is preferred that students complete assignments during the semester that the course is taken. You do not want the burden of an INC when you go on to take other course.

A graduate student who receives a grade of INC (incomplete coursework) has one year from the time the grade was entered on the transcript to make up the work and have a change of grade submitted by the instructor. An INC grade entered in a fall semester, for example, must be completed before the end of the next fall semester. INC grades that are not made up within one year remain permanently on the record as INCs. They may not be made up at any later date unless the student successfully appeals for permission to do so. Permanent incompletes do not count in the Grade Point Average. INC grades cannot be made up after the student graduates.

Writing - Writing skills are absolutely essential for public health professionals. Written assignments should be used as an opportunity to sharpen and strengthen the skills you already

have. Therefore, please take the time and effort to ensure that your written work is free from misspellings, typos and major grammatical errors. Additionally, students are expected to appropriately cite all references used in presentations or written materials. Work that is not clearly organized and reasonably well written will be returned for a re-write, but nevertheless, will have a half letter graded deducted for the re-submission.

Help with research and writing - Students who need help with research and writing can contact the Academic Center for Excellence at 718.960.8175

Cell Phone and Laptops/iPads Use - Please keep all cell phones on silent and out of view during class. If you choose to use a Laptop or iPad in class, it should be used exclusively for note taking – not email, surfing the net, etc.

Institutional Policies

Accessibility - If students with disabilities require accommodations to allow greater accessibility to the academic environment, these students should contact The Office of Special Student Services is located in Shuster Hall, Room 238, 718-960-8441, TTY 718- 960-8931. For more information, visit *www.lehman.edu/vpstud/spstudentserv*.

Academic integrity - Academic Dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion. Please review graduate bulletin for further detail. Additionally, the instructor will use SafeAssign in instances where there is question as to the originality of the material submitted.

While you are encouraged to discuss ideas with each other to facilitate your learning experiences, the work that is turned in must be your own. For example, allowing someone to copy your work, passing or sharing your answers to others, and/or doing work for others (including computer assignments) are examples of violations of Academic Integrity. For more information please visit and read the University of California Davis website (http://sja.ucdavis.edu/academic-integrity.html HYPERLINK "http://sja.ucdavis.edu/academic-integrity.html") or visit the Center for Academic Integrity at Clemson University (http://www.academicintegrity.org HYPERLINK "http://www.academicintegrity.org/") for a detailed description of academic integrity. One of the more common and more destructive breaches of academic integrity is plagiarism. Visit the Plagiarism.org Learning Center (http://www.plagiarism.org HYPERLINK "http://www.plagiarism.org/") for more information on how to avoid plagiarism. The concerns and guidelines provided in these websites will be seriously applied in this course.

Disability Act - In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Lehman College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/ or Learning) consult the Office of Special Student Services in the Division of Student Affairs. The Office of Special Student Services is located in Shuster Hall, Room 238, Tel. (718) 960-8441, TTY (718) 960-8931.

Grade appeals - If you wish to challenge a grade, you must complete the following:

- Read the policy regarding Grade Appeals in the Graduate Bulletin. Consult the instructor who assigned the grade to attempt to resolve the situation. You must do this no later than the end of the semester, following the semester in which the grade was assigned.
- If resolution is impossible, and if you still wish to challenge the grade, you should consult your program adviser, who will attempt to resolve the situation. (if the adviser is the instructor who issued the original grade, consult the department chair).
- If you wish to challenge the grade further, you should appeal in writing to the chair of your department (if the chair is the instructor who issued the original grade, consult the chair of the department's Personnel and Budget Committee), submitting any and all documents that support your case. The chair will form a grade appeal committee as described in the Graduate Bulletin. The decision of the Graduate Grade Appeal Committee is final.

Class Schedule

Session	Date	Topic	Readings/ Assignments
1	Feb. 1st	Course Overview Overview of Social Determinants of Health	Discussion of factors and conditions that influence health behavior and health outcomes.
2	Feb. 8th	Introduction to Theories of Behavioral and Social Science	Behavioral Change Models Reading distributed
February 15th - No Class			
3	Feb. 22nd	Cont. Theories of Behavioral and Social Science	Behavioral Change Models continued
4	Feb. 29th	Social Determinants of Health – Application to Social & Behavioral Health	CDC – What are Social Determinants of Health? (BB: Readings folder) NAS: Executive Summary, pp.1-16
Biological & Behavioral Factors Affecting Health			
5	March 7th	Bio-behavioral Factors in Health and Disease	NAS: pp. 39-47, pp. 51-53, pp. 55-57
6	March 14th	▫ Long-Term Effects of Stress ▫ **Quiz – first half of class**	NAS: pp. 57-61, 64-70
7	March 21st	▫ Behavioral Risk Factors: Tobacco, Obesity, etc.	NAS: pp. 87-101
8	March 28th	continued – Behavioral Risks Factors: Alcohol, STDs	NAS: pp. 102-113
9	April 4th	The Marketing of Disease Promoting Products	*Ethical implications of target market selection.* Rittenburg, Terri L.; Parthasarathy, Madhavan Journal of Macromarketing, Fall97, Vol. 17 Issue 2, p49, 16p, 2 charts, 3 diagrams (BB Readings folder)

Impact of Socio-Economic Factors and Social Inequities on Health			
10	April 11th	Social Determinants: Socio-Economic Status & Health	NAS: pp. 138-151
11	April 18th	Social Determinants: ▫ Occupation & Health ▫ Social Inequities & Health ▫ **Due: News Watch Paper & Presentation**	NAS: 151-157 NAS:163-166
Individual and Community Assets/Resources for Achieving Social & Behavioral Health			
12	May 2nd	▫ *An ounce of prevention…* ▫ Review: Change Theories	NAS: pp. 113-121
April 25th – May 1st SPRING BREAK			
13	May 9th	Role of Social Networks, Support, and Capital in Health & Wellbeing	*Toward a Theory of Social Support: Closing Conceptual Gap*. Schumacher & Brownell. journal of social issues, vol. 40, no. 4, 1984, pp. 11-3 https://koutsi.files.wordpress.com/2012/08/shumaker-1984.pdf NAS: pp. 145-151, pp.163-166
14	May 16th	Models and Intervention Strategies	▫ *The Role of Social & Behavioral Science in Public Health Practice: A Study of the NYC Dept. of Health*. VanDevanter, N. et al., Jour of Urban Health, V.80, No.40 Dec. 2003 (BB Readings Folder) ▫ NAS: pp. 179-220
15	May 23rd Exam Week	▫ **Results: Presentation Public Awareness Survey** ▫ **Final Paper Due**	

PARTICIPATION RUBRIC

Your class participation will be scored using this Participation Rubric – 10% of grade/

	Strong work (3)	Needs development (2)	Unsatisfactory (1)
Active listening (3 points)	Actively and respectfully listens to peers and instructors; consistently engaged and focused.	Sometimes displays lack of interest; not entirely engaged throughout the session; occasionally checks email, instant/text messages or other noncourse material during class time.	Projects lack of interest during class; apparent visible clues that s/he is not listening to peers or instructors; frequently checks email, instant/text messages or other non-course internet material during class time.
Preparation (3 points)	Arrives to class with questions about reading assignments; active involvement in the journal article breakout sessions, clearly demonstrating that s/he has read/thought about the material	Sometimes arrives unprepared or with only superficial preparation for the journal article breakout sessions	Exhibits little evidence of having read or thought about assigned material
Quality of contributions to class discussions (3 points)	Comments and asks pertinent questions frequently. Expresses thoughts clearly.	Comments and questions sometimes advance the discussion, but sometimes do little to move it forward	Thoughts are not expressed clearly; comments are often off topic; or student does not participate in class discussions
Attendance (3 points)	Arrives to class on time, does not have unexcused absences, and absent $\leq$ 2 times	Usually arrives to class on time; absent $\leq$ 2 times, but only sometimes informs instructors about unavoidable absences.	Arrives consistently late, and/or does not inform instructors about absences, or absent > 2 times.

* adapted from:
http://www46.homepage.villanova.edu/john.immerwahr/TP101/EvDay/discussion%20ru

bric.pdf HYPERLINK "http://www46.homepage.villanova.edu/john.immerwahr/TP101/EvDay/discussion%20rubric.pdf/". Accessed on July 21, 2010

THE CUNY SCHOOL OF PUBLIC HEALTH & HEALTH POLICY

Health Equity and Social Justice

PHE 709 (3 credits)

Spring 2016

Catalogue description:	This course analyzes health inequities and explores social, economic, political, and historical determinants of health, including unequal access to care and treatment by race and ethnicity, patterns of immigration, cultural bases of health, strategies for communicating with diverse populations, and interventions for reducing and eliminating ethnic and racial health inequities from an ethical and public policy perspective.
Course meets:	Tuesdays 6:00pm - 8:40pm
Instructor:	**Marilyn Aguirre-Molina, EdD, MS**
Email:	marilyn.aguirre-molina@lehman.cuny.edu (best way to reach instructor)
Phone:	718-960-6928 Office OR: 917-731-4323 Cell
Office:	Gillet Hall 422-C
Office hours:	Tuesdays 3pm - 5:30pm, and Wednesdays 3pm – 5:30pm Or by appointment to meet student's need
Required book:	There is no required text. Class readings will be listed in the syllabus or posted on BlackBoard.
Recommended Reference books:	▪ An American Health Dilemma: Race, Medicine, and Health Care in the United States, 1900-2000 W. Michael Byrd and Linda A. Clayton. (2001) ▪ Bad Blood: The Tuskegee Syphilis Experiment, Revised Edition. James H. Jones, (1992) ▪ Environmental Health and Racial Equity in the United States Robert Bullard, Glen Johnson, Angel Torres (2011) ▪ Examining Tuskegee: The Infamous Syphilis Study and Its Legacy (The John Hope Franklin Series in African American History and Culture) Susan M. Reverby (2009) ▪ Health Disparities in the United States: Social Class, Race, Ethnicity, and Health. Donald A. Barr (2008) ▪ Health Issues in the Black Community Thomas LaVeist, (Editor) (2001)

- Health Issues in Latino Men – A social and structural approach
  Marilyn Aguirre-Molina, Luisa Borrell, William Vega (Editors),(2010)
- Health Issues in the Latino Community
  Marilyn Aguirre-Molina, Carlos Molina, Ruth Zambrana (Editors), (2001).
- Mental Health: Culture, Race, and Ethnicity—A Supplement to Mental Health: A Report of the Surgeon General. U.S. Department of Health and Human Services, Washington, D.C.
  David Satcher (2001)
- Public Health and Social Justice
  Martin T. Donohoe (Editor)(2013)
- Race, Ethnicity and Health.
  Thomas A LaVeist, (Editor) (2002)
- Social Determinants of Health
  Michael Marmot and Richard G. Wilkinson (2006)
- The Spirit Level: Why Greater Equality Makes Societies Stronger
  Richard Wilkinson and Kate Pickett (2010)
- The Tuskegee Syphilis Study: The Real Story and Beyond (Paperback)
  Fred D. Gray, 1998
- Tuskegee's Truths: Rethinking the Tuskegee Syphilis Study
  Susan M. Reverby (2001)

  Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. Institute of Medicine of the National Academies. Brian D. Smedley, Adrienne Y. Stith, and Alan R. Nelson (Editors) (2003)

Source of data for the Bronx:

DISCOVERING THE BRONX: USING CENSUS DATA TO HIGHLIGHT SOCIAL PROBLEMS AND ACHIEVEMENTS IN A MAJOR URBAN AREA
http://www.lehman.edu/deannss/bronxdatactr/discover/bxtext13.htm

DEGREE COMPETENCIES

This course will help you to achieve the following core competencies, which are expected of all MPH / MS graduates

Lehman MPH Competencies	**Course Learning Objectives** (that correspond to the MPH Competencies)
This course will help you to achieve the following competencies, which are expected of Community-based Public Health and Health Equity track MPH graduates at Lehman	After successfully completing this course, you are expected to be able to:
Analyze critical health inequalities confronting urban populations by social and economic determinants such as race, ethnicity, income and neighborhood	* Identify and describe the economic, institutional and socio-cultural factors affecting the health and well-being of ethnic and racial communities in the U.S. * Identify and discuss how social determinants (e.g., employment, residential and racial segregation, stress) influence the health of ethnic and racial groups
Identify aspects of public health ethics and values of social justice that affect public health practice and decision-making	* Interpret, analyze and discuss the role of race and structural racism as it influences health and other inequities * Assess and present existing policies and programs to ascertain the extent to which they respond to the needs of these populations and how they can contribute to achieving health equity
Analyze and interpret public health literature	* Cuts across all course objectives

Assessment and Grading

Please see below under **Assignments section** where there is greater detail of the assignments and expectations. Your understanding of the course material will be evaluated through the following student requirements & grading:

- **Attendance** (5%), will be taken at each class.
  Evidence of assigned readings, and
- **Class Participation** (10%)
  (15% of total grade)

- **Essay - The Universal Declaration of Human Rights**
  Significance for Health Equity (300-400 words. See below for more detail)
  DUE: March 1st **(15% of grade)**

- **Student Led Discussion of Reading** **(10% of total Grade)**

- **Analysis of a Neighborhood's Social Determents of Health** (See below for more detail) **(45% of grade)**
  DUE: Draft May 3rd
  Final paper May 24th

- **Poster Preparation** **(10% of grade)**
  DUE: May 24th

- **Poster Presentation of Neighborhood Analysis**
  (5% of grade)
  DUE: May 24th

Please enter assignment due dates in your calendar

Course Policies & Expectations

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Attendance & Class Participation - Your attendance is crucial to the effectiveness of this course and to your overall grade. If you must be late or absent please call or email me prior to the class. This course is designed to be highly participatory, which requires that students as well as the instructor come to class prepared. The combination of required readings, instructor

presentations, guest lecturers, and field visits is intended to stimulate interactive discussions during the class meetings. Therefore, students will gain the most from this course if they come prepared to class and engage in discussions that are informed by the readings.

Students are expected to demonstrate evidence of preparation by engaging in discussions, raising questions, and participating in exchanges with classmates that are relevant and related to the readings, lectures and course assignments.

Assigned Readings - Course readings have been selected to provide a foundation on which class sessions and lectures are based. As such, to promote in class learning and discussion it is necessary to keep up with the readings that are assigned each week. If you have not read the week's assignment, it will not be possible to participate in the class discussion.

Writing - Writing skills are absolutely essential for public health professionals. Written assignments should be used as an opportunity to sharpen and strengthen the skills you already have. Therefore, please take the time and effort to ensure that your written work is free from misspellings, typos and major grammatical errors. Additionally, students are expected to appropriately cite all references used in presentations or written materials. Work that is not clearly organized and reasonably well written will be returned for a re-write, but nevertheless, will have a half letter graded deducted for the re-submission. Students who need help with research and writing can contact the Academic Center for Excellence at 718.960.8175

Late submission of assignments - All assignments must be submitted in class and email to the instructor on the date they are due. Late assignments will have half a letter grade deducted.

Cell Phone and Laptops/iPads Use - Please keep all cell phones on silent and out of view during class. If you choose to use a Laptop or iPad in class, it should be used exclusively for note taking – not email, surfing the net, etc.

Grade of incomplete – The instructor will only issue a grade of INC under the most extreme circumstances. It is preferred that students complete assignments during the semester that the course is taken. You do not want the burden of an INC when you go on to take other course.

A graduate student who receives a grade of INC (incomplete coursework) has one year from the time the grade was entered on the transcript to make up the work and have a change of grade submitted by the instructor. An INC grade entered in a fall semester, for example, must be completed before the end of the next fall semester. INC grades that are not made up within one year remain permanently on the record as INCs. They may not be made up at any later date unless the student successfully appeals for permission to do so. Permanent incompletes do not count in the Grade Point Average. INC grades cannot be made up after the student graduates.

Grade appeals - If you wish to challenge a grade, you must complete the following:

* Read the policy regarding Grade Appeals in the Graduate Bulletin. Consult the instructor who assigned the grade to attempt to resolve the situation. You must do this no later than the end of the semester, following the semester in which the grade was assigned.
* If resolution is impossible, and if you still wish to challenge the grade, you should consult your program adviser, who will attempt to resolve the situation. (if the adviser is the instructor who issued the original grade, consult the department chair).
* If you wish to challenge the grade further, you should appeal in writing to the chair of your department (if the chair is the instructor who issued the original grade, consult the chair of the department's Personnel and Budget Committee), submitting any and all documents that support your case. The chair will form a grade appeal committee as described in the Graduate Bulletin. The decision of the Graduate Grade Appeal Committee is final.

Office hours:

Office hours are Tuesdays 3pm - 5:30pm, and Wednesdays 3pm – 5:30pm
Or by appointment to meet student's need (see first page for phone number and location).

I encourage you to meet with me to discuss any and all course related issues, assignments and questions you may have. I look forward to providing assistance so that the course results in a genuine learning experience for you.

No extra credit:

There is not an extra credit option for this course. Students' grades are based on the assignments and expectations described in the syllabus.

Institutional Policies

Accessibility - If students with disabilities require accommodations to allow greater accessibility to the academic environment, these students should contact The Office of Special Student Services is located in Shuster Hall, Room 238, 718-960-8441, TTY 718- 960-8931. For more information, visit *www.lehman.edu/vpstud/spstudentserv*.

Academic integrity - Academic Dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion. Please review graduate bulletin for further detail. Additionally, the instructor will use SafeAssign in instances where there is question as to the originality of the material submitted.

Help with research and writing - Students who need help with research and writing can contact the Academic Center for Excellence at 718.960.8175

Assignments

Papers must be submitted via email on the date which they are due. In fairness to students who submit assignments on deadline, late papers will have 2 points deducted.

- **Attendance -** Attendance is required for all classes. In the event you are unable to attend due to justifiable circumstances, please send an email, or call to notify the professor.
  (5% of grade)

- **Class Readings & Participation –** It is essential that students remain current with assigned readings. At the start of each, there will be a discussion asking students the primary "take away" from the readings that week. This entails reading the material and identifying the key issue that captured your attention, and why. **(10% of grade)**

- **Essay - WRITE AN ESSAY OF 300 – 400 WORDS**
  DUE: March 1st **(15% of grade)**

  See Attachment 1 – at the end of the syllabus for guidelines, "*How to Write an Essay – Ten Easy Steps*"

  The Universal Declaration of Human Rights – Significance for Health Equity
  http://www.un.org/en/documents/udhr/

  This document was adopted by the General Assembly of the United Nations in 1948. The implementation and adoption of the principles therein have great significance for achieving social justice and health equity. Please prepare an essay discussing your
  1. Analysis of the document as a blueprint for achieving social justice and/or health equity (i.e., is it feasible, realistic, or other response you may have), and
  2. If you were charged with identifying an Article that would initiate or begin the process of the achieving social justice and/or health equity, which would it be and why?

  The essays should be no more than 500 – 600 words (not counting the reference list); this requires that you be succinct, precise and efficient in discussion so that you remain within the allotted number of words. Do not just fill the pages with description of the Declaration, but assure that the content demonstrates a mastery of the material and demonstrates your ability to analyze and convey your insights and perspective. There will be class discuss for further classification.

- **Student Led Discussion**

  Each student will select a topic of special interest and lead the class discussion

on the main paper assigned under the topic for the class. The discussion will entail an introduction to the topic/paper, and follow with discussions questions that will highlight the major issues, and stimulate student engagement in the discussion and learning process. **(10% of total grade)**

☀ Neighborhood Analysis

"What I hear, I forget. What I see, I remember. What I do, I understand."

Kung Fu Tzu (Confucius)

Analysis of a Neighborhood's Social Determents of Health: Students will partner in teams of 2 to identify and analyze the structural and social factors (social determinants) that are contributing to health inequities in a selected community. This will require that the team select a zip code, school district, or electoral district reflective of a community where **health disparities are apparent** when compared to other neighborhoods in New York City. Identify 2 or 3 health issue/problems that are especially pronounced in the community, and identify how the social and structural conditions of the neighborhood cause or contribute to health problem.

The fact finding process should entail literature, review of relevant documents, interviews with those who work in the community, and field observation by walking in the neighborhood – conduct an **environmental audit** - for information that is not readily available in print. This will be discussed in class with audit sheets distributed.

In preparation for the field study, please read the below on *Critical Thinking* so that you understand what it takes to undertake an analysis of the community, and prepare an analytic paper. This and the process will be reviewed in class.

* Community Tool Box: Section 3. Thinking Critically
http://ctb.ku.edu/en/table-of-contents/analyze/analyze-community-problems-and-solutions/think-critically/main

All three parts of this assignment must demonstrate students' understanding of social determinants and how they are linked to health outcomes, as well as the factors that underlie health inequity. This assignment will be discussed throughout the semester so that you are prepared to carry it out. In addition, outline of paper structure will be distributed.

1. **Paper:**
The fact finding and analysis will be presented in a paper of approximately 8 pages, in addition to a reference list. The paper should contain charts, graphs, maps or any other material that presents the case and demonstrates how the social structures contribute to the health problems in the neighborhood. A draft of the paper will be submitted for faculty review.

DUE: **May 3th - Draft**
May 24th – Final paper **(45% of grade)**

2. **Poster Preparation:**
   a. Using the standard format of a scientific poster for presentation at a professional meeting, students will prepare a poster describing the community, determinants of health analyzed, methods employed, findings, and recommendations. (templates are available on BB)
   b. The poster must be written in such a manner so that the key information is clearly and succinctly stated. The reader must be able to know without question what you did, why, and what you found. Follow the template heading.
   DUE: **May 24th** **(10% of grade)**

   c. The posters must be submitted on deadline so that Donna Covington Hargrove of the MPH Program Staff, may have time to print them.

   POSTER SUBMISSION FOR PRINTING DUE to Donna: May 10th
   Poster template must be submitted to Donna no later than May 10th so that she will have the posters ready for presentations on May

3. **Class Presentation:**

   The posters will be displayed around the classroom so that students may walk around and read each one. Once read, the class will comment on each of the posters with questions, comments, or share comments on common issues/problems observed across the communities studied.

   The class members will have read the posters prepared by each team, therefore, the presentations should discuss the insights gained through the process, lessons learned, and major take away from the experience.
   DUE: **May 24th** **(5% of total grade)**

4. **PAPER IS DUE ON May 24th**

CLASS SCHEDULE		
DATE	**TOPICS**	**ASSIGNMENTS**
Session 1 **February 2nd**	**Topic** **Readings**	▪ **Course Overview** ▪ **Introduction to social determinants of health and health equity** National Research Council. U.S. Health in International Perspective: Shorter Lives, Poorer Health. Washington, DC: The National Academies Press, 2013. Summary - Pg. 1-10 http://www.nap.edu/openbook.php?record_id=13497&page=R1 Principles and Basic Concepts of Equity and Health. Division of Health and Human Development, PAHOWHO, 1999 http://www.paho.org/enpringglish/hdp/hdd/pahowho.pdf **NOTE:** Please read, review and familiarize yourself with the below document. It contains the fundamental language and definitions of the course, and the public health field of equity and social justice. Racial Equity Glossary http://racialequitytools.org/glossary#
FEBRUARY 9 TH		**NO CLASS: FRIDAY SCHEDULE**

Session 2 **February 16th**	**Topic** **Readings**	**The changing demography of the U.S. – implications for public health, equity and social policy** New York City Population Projections by Age/Sex & Borough, 2010–2040; NY Department of City Planning (December 2013). Pages 1-6, 13-15 http://www.nyc.gov/html/dcp/pdf/census/projections_report_2010_2040.pdf The Changing Demographics of America: The United States population will expand by 100 million over the next 40 years. Is this a reason to worry? http://www.smithsonianmag.com/40th-anniversary/the-changing-demographics-of-america-538284/#xQ0VUZi1WcjZcMWE.03 **Please review the following document - it will be a vital resource as you decide in which community you will do the field assignment:** New York City 2010 - Components of Change by Race and Hispanic Origin for New York City Neighborhood Results from the 2010 Census. City of New York Planning Department. http://www.nyc.gov/html/dcp/pdf/census/census_brief2_051012.pdf
Social Determinants of Health		
Session 3 **February 23rd**	**Topic** **Readings**	**Equity & Health** The concepts and principles of equity and health. M. Whitehead. Health Promotion International, Oxford University Press, 1991. http://salud.ciee.flacso.org.ar/flacso/optativas/equity andhealth.pdf Ethnicity, Migration and the Social Determinants of Health Agenda. D. Ingleby Psychosocial Intervention. Vol. 21, No. 3, 2012 - pp. 331-341.

		file:///D:/HEALTH%20EQUITY%20&%20SOCIAL%20JUSTICE/HEALTH%20EQUITY%20&%20SOC%20JUSTICE/Assigned%20Readings/Migration%20&%20Health%20Equity.pdf Closing the gap in a generation: health equity through action on the social determinants of health. Michael Marmot, et al. Lancet 2008; 372: 1661–69
Session 4 **March 1st** **DUE:** **Essay on the Declaration of Human Rights** .	**Topic** **Readings** **Assignment**	**Introduction to social determents of health** CDC Health Disparities and Inequalities Report, United States 2011; MMWR, January 14, 2011. Read: Pg. 1-17 http://www.cdc.gov/mmwr/pdf/other/su6001.pdf Health Disparities in New York City – April 2010 (Summary) http://www.nyc.gov/html/doh/downloads/pdf/episrv/disparitiesonesum.pdf Editorial: Social Determinants of Health Equity. M Marmont & J. Allen. American Journal of Public Health: September 2014, Vol. 104, No. S4: S517–S519. http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.2014.302200 Before the class meets please view the video: SOCIAL DETERMINANS OF HEALTH – Camara Jones, PhD, Centers for Disease Control http://vimeo.com/20767095 **Recommended Readings for Review & Reference** WHO (2003) *Social Determinants of Health: The Solid Facts.* Copenhagen, Denmark: The World Health Organization (2003). http://www.euro.who.int/__data/assets/pdf_file/0005/98438/e81384.pdf National Health Disparities Report – 2008 Agency for Healthcare Research Agency for Healthcare Research and Quality http://www.ahrq.gov/qual/nhdr08/nhdr08.pdf National Center for Chronic Disease Prevention. (2005) *Health Disparities A Selected Bibliography*. Prepared for the 19th National

		Conference on Chronic Disease Prevention and Control. Washington, DC: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. http://www.cdc.gov/nccdphp/publications/healthdisparities/pdf/biblography.pdf
Deconstructing the Social Determinants of Health		
Session 5 **March 8th**	**Topic** **Readings**	**Race: A Social Determinant of Health** (Impact of Race/Racism on Health) Race and Ethnicity in Public Health Research: Models to Explain Health Disparities. William W. Dressler, Kathryn S. Oths, and Clarence C. Gravlee. Annu. Rev. Anthropol. 2005. 34:231–52 http://www.gravlee.org/files/pdfs/Dressler%20et%20al%202005.pdf Williams and Mohammed. "Racism and Health I: Pathways and Scientific Evidence". *American Behavioral Scientist*. 57(8) 1152–1173 (2013) http://scholar.harvard.edu/files/davidrwilliams/files/2013b.pdf Editorial: Racism is a Public Health Problem. Harvard Journal of Public Health. Vol.3, January 2015. http://harvardpublichealthreview.org/hphr-editorial-racism-is-a-public-health-problem/
Neighborhood, Housing, and Food Security		
Session 6 **March 14th**	**Topic** **Readings**	**Neighborhood Effects on Health – Environmental Justice** **Andrew Maroko, PhD** Assistant Professor of Public Health CUNY School of Public Health & Health Policy *"Why Your Zip Code May Be More Important to Your Health Than Your Genetic Code"* - The Huffington Post, April 29, 2009 http://www.huffingtonpost.com/james-s-marks/why-your-zip-code-may-be_b_190650.html *Why Our Greatest Health Concern Isn't Diet or Exercise -- It's Neighborhood.* Larry Edelman, **Alternet,** March 19, 2009

		http://www.alternet.org/story/127488/ Health Disparities in New York City in Life Expectancy and Death – April 2010 http://www.nyc.gov/html/doh/downloads/pdf/episrv/disparitiesone.pdf Unhealthy Air Quality – United States, 2006-2009 (pg. 28-32) http://www.cdc.gov/mmwr/pdf/other/su6001.pdf **Residential Segregation and Health** LaVeiSt, Gaskin, Trujillo (2011) *Segregated Spaces, Risky Places: The Effect of Racial Segregation on Health Inequalities*. Joint Center for Political and Economic Studies, Washington, D.C. http://www.jointcenter.org/sites/default/files/upload/research/files/Segregated%20Spaces-web.pdf *Environmental Equity and Health: Understanding Complexity and Moving Forward.* M. E. Northridge, et al. Am J Public Health. 2003 February; 93(2): 209–214. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447718/ *Housing Discrimination Against Racial and Ethnic Minorities 2012*; U.S. Department of Housing and Urban Development Washington, D.C. Prepared: The Urban Institute, June 2013. Authors: Austin Turner, Santos, Levy, Wissoker, Aranda, Pitingolo http://www.huduser.org/Publications/pdf/HUD-514_HDS2012.pdf *Residential Segregation and Housing Discrimination in the United States - Violations of the International Convention on the Elimination of All Forms of Racial Discrimination*: A Report to the U.N. Committee on the Elimination of Racial Discrimination, January 2008; The Poverty & Race Research Action Council and The National Fair Housing Alliance http://www.prrac.org/pdf/FinalCERDHousingDiscriminationReport.pdf Margery Turner. "How wide are the Racial Opportunity Gaps in Your Metro Area?" Urban Institute, Metro Trends Blog, February 2012. http://blog.metrotrends.org/2012/02/wide-opportunity-gaps-metro/

Session 7 **March 22nd**	**Topic**	**Food Desert or Fields of Fat?** Hunger in America: 2013 United States Hunger and Poverty Facts. World Hunger Education Service http://www.worldhunger.org/articles/Learn/us_hunger_facts.htm Food Desert and Food Balance http://www.marigallagher.com/site_media/dynamic/project_files/FoodDesertFactSheet-revised.pdf Fast Foods Facts http://fastfoodmarketing.org/fast_food_facts_in_brief.aspx The Supplemental Nutrition Assistance Program, soda, and USDA policy: Who benefits?. Brownell KD, Ludwig DS *Journal of the American Medical Association*. 2011 Sep; 306(12):1370-1371. http://www.yaleruddcenter.org/resources/upload/docs/what/policy/SNAPSodaNYCUSDA_JAMA_9.28.11.pdf Access to Healthy Foods in Low Income Neighborhoods: Opportunities for Public Policy http://www.yaleruddcenter.org/resources/upload/docs/what/reports/RuddReportAccesstoHealthyFoods2008. **Marketing Disease** Targeted Marketing by Fast Food Companies http://fastfoodmarketing.org/media/FastFoodFACTS_TargetedMarketing.pdf Center on Alcohol Marketing and Youth: Exposure of African American Youth to Alcohol Advertising – 2003-2004 http://www.camy.org/bin/u/m/AA_061406.pdf Exposure of Hispanic Youth to Alcohol Advertising – 2003-2004 http://www.camy.org/bin/u/n/report.pdf Ethical Implications of Target Market Selection. Journal of Macromarketing, Fall 1997 http://polaris.umuc.edu/~rouellet/tman613sp99/suppread/Paper23.htm

Session 8 **March 29th**	**Topic** **Readings**	**Police Aggression as a Social Determinant of Health** Krieger, N., et al. *Trends in US deaths due to legal intervention among black and white men, age 15-34 years, by county income level: 1960-2010*. Harvard Public Health Review. Vol. 3, January 2015 http://harvardpublichealthreview.org/190/ *Stop and Frisk 2011*. New York Civil Liberties Union Report http://www.nyclu.org/files/publications/NYCLU_2011_Stop-and-Frisk_Report.pdf Editorial: *Police Aggression as a Social Determinant of Health.* Aguirre-Molina, M. CUNY Institute for Health Equity (2015) **BlackBoard**.
Session 7 **April 5th**	**Topic**	**Work and Health:** **Occupational as a Determinant of Health** Sick and Tired of Being Sick and Tired: Scientific Evidence, Methods, and Research Implications for Racial and Ethnic Disparities in Occupational Health. LR Murry. Am J Public Health. 2003 February; 93(2): 221–226. *What is Workplace Safety*? Workplace Safety Tool Kit. Nonprofit Risk Management Center. http://www.nonprofitrisk.org/tools/workplace-safety/public-sector/foundation/wkplcsafety-ps.htm This reading is for review purposes only. US Department of Labor, Occupational Safety & Health Administration, *OSHA Law and Regulations*. https://www.osha.gov/law-regs.html
Gender, Health and Equity		
Session 9 **April 12th**	**Topic**	**Health OF Women of Color** Racial/Ethnic Variations in Women's Health: The Social Embeddedness of Health. D. R. Williams, PhD, MPH. Am J Public Health. 2002;92:588–597 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2518577/pdf/0980038.pdf

s		Women of Color Health Data Book (2005). Office of Research on Women's Health. National Institutes of Health. Read pgs. 1-45 http://www.csu.edu/cerc/documents/WomenofColorHealthDataBook2006.pdf Women at Risk: Health of Women in NYC - 2005 Report from the New York City Department of Health and Mental Hygiene http://www.nyc.gov/html/doh/downloads/pdf/data/data-womenatrisk-2005.pdf Intimate Partner Violence Against Women in NYC, 2008 Report from the New York City Department of Health and Mental Hygiene http://www.nyc.gov/html/doh/downloads/pdf/public/ipv-08.pdf
Session 10 **April 19th**	**Topic** **Assignment**	**Children** MAP THE MEAL GAP: CHILD FOOD INSECURITY 2015 A Report on County and Congressional District Level Child Food Insecurity in the United States in 2013; Feeding America. http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2013/map-the-meal-gap-2013-exec-summ.pdf Bauman, Silver, Stein. *Cumulative Social Disadvantage and Child Health.* Pediatrics Vol. 117 No. 4 April 1, 2006, pp. 1321 - 1328 http://pediatrics.aappublications.org/content/117/4/1321.full.pdf+html *Mental Health Surveillances Among Children*. Morbidity and Mortality Report Weekly. CDC. May 2013 Read pages: 1-15 **http://www.cdc.gov/mmwr/pdf/other/su6202.pdf** Assignment**:** Go on to the *Kids Count Data Center website.* A Project of the Anne Casey Foundation. Familiarize yourself with the data for NYC and the Bronx. Make notations of the information that you believe has the greatest impact on the health of children in New York City and the Bronx. provides http://datacenter.kidscount.org/data#NY/2/0

		http://datacenter.kidscount.org/data?gclid=CJLO1tark7wCFfM7OgodQWkAhA#USA/2/2/3,4,5,6
SPRING BREAK: April 25th – May 1st		
Session 11 **May 3rd** **DUE:** **Draft of Paper for faculty review**	**Topic** **Readings** **Topic** **Readings**	**Health of Men of Color** Slopen, N & Williams, D. (2010). Improving the Health of Young Boys and Men of Color. http://technologylink.typepad.com/files/chapter-11-improving-the-health-of-bmoc-slopen-and-williams.pdf Silverman, C., et al., (April 2011). The Consequence of Structural Racism, Concentrated Poverty, and Violence on Young Men and Boys of Color. http://www.boysandmenofcolor.org/wp-content/uploads/2011/05/Youth-Violence-for-Boys-and-Men-of-Color-Research-Brief.pdf *** **GLBT** To follow
Social Policy, Health Inequities & Social Justice		
Session 12 **May 10th** **DUE:** **Submit poster for printing**	**Topic** **Readings**	**Social Policies:** **Part I - Government Programs and Policies** - Tuskegee Syphilis Study - Sterilization - Foster Children and AIDS Studies - US Conducted AIDS Studies in Guatemala Susan Reverby. Ethical Failures and History Lessons: The U.S. Public Health Service Research Studies in Tuskegee and Guatemala *Public Health Reviews, Vol. 34, No 1(2012)* http://www.publichealthreviews.eu/upload/pdf_files/11/00_Reverby.pdf Corbie-Smith, G., Thomas, S., St. George, DM. *Distrust, Race, and Research.* Arch Internal Med/Vol. 162, Nov 25, 2002 (pp. 2459-2463) http://minorityhealth.pitt.edu/354/1/Distrust,_Race_and_Research_(Archives_of_Internal_Medicine).pdf

		Short Articles AIDS on nbc.com: Government Tested AIDS Drugs on Foster Kids http://www.nbcnews.com/id/7736157/ns/health-aids/t/government-tested-aids-drugs-foster-kids/#.UuCyD9Io5dh NPR Interview with NIH Specialist Who Exposed Foster Kids AIDS Study http://www.npr.org/templates/story/story.php?storyId=4669470 The Huffington Post - US Apology for STD Studies in Guatemala in 1940s http://www.huffingtonpost.com/2010/10/01/us-guatemala--syphilis-study_n_747438.html?view=print&comm_ref=false **Part 2 - Structural Racism: Government Programs and Policies** Alexander, M.(2012*). The New Jim Crow*. The New Press. New York, NY. Chapters 1& 5 **(BlackBoard)** Oboler, S. (2009). *Behind Bars – Latino/as and Prison in the United States.* Paulgrave Macmillan. New York, NY. Chapter 1 **(BlackBoard)** National Commission on Correctional Health, Report to Congress: *The Health of the Soon to be Released Inmate* – Vol. I . (2005). National Commission on Correctional Health Care. National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. Executive Summary, Pgs. ix-xx http://www.ncchc.org/filebin/Health_Status_vol_1.pdf Race, Crime and Punishment – Breaking the Connection in America (2011). Aspen Institute. Chapters 1,2,3,4 http://www.aspeninstitute.org/sites/default/files/content/docs/pubs/Race-Crime-Punishment.pdf

Where Do We Go From Here?		
Session 13 **May 17th** **Last class**	**Topic** **Readings**	**Social and Policy Movements to Achieve Health Equity and Social Justice** 1. State of the Health Equity Movement 2011 Update The DRA Project - a project of the Institute for Alternative Futures DRA Project Report No. 11-01 http://www.altfutures.org/draproject/pdfs/Report_11_01_HealthEqui tyMovement_PartAOverview.pdf 2. DHHS Action Plan to Reduce Racial and Ethnic Disparities: A Nation Free of Disparities in Health and Healthcare – The Department of Health and Human Services, 2011 http://minorityhealth.hhs.gov/npa/files/Plans/HHS/HHS_Plan_com plete.pdf 3. Partners for Public Health: Working with local, state, and federal agencies to create healthier communities, Bay Area Regional Health Inequities Initiative, 2011, Pg. 1-29 http://www.barhii.org/resources/downloads/partners_for_public_heal th.pdf
EXAM WEEK **May 24th** **Assignment Due:** Neighborhood Assessment Paper and Poster Presentation	**Topic**	**STUDENT PRESENTATIONS** **Neighborhood Analysis of Social Determinants of Health** * **Poster Presentations** * **Student Discussion:** Neighborhood Analysis of Social Determinants of Health

GISc SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

Lehman College, City University of New York
PHE 717: The Geography of Urban Health
Spring 2016

Catalogue description	A geographical examination of urban health including the historical perspective of health geography; mapping and spatial analysis of health and health impacts; the social and spatial patterning of health; the geography of health inequalities and disparities; health and social/spatial mobility; and the effects of urban segregation, overcrowding, and poverty on disease illustrated through GISc laboratory exercises. Pre-req: PHE 705 or departmental permission
Course meets	Gillet Hall, Room 311 (classroom) Fridays, once per month, from 4:00 – 6:00 PM, dates as noted below.
Instructor	Profs. Juliana Maantay and Andrew Maroko
Email	Juliana.maantay@lehman.cuny.edu Andrew.maroko@lehman.cuny.edu
Phone	718 960-8574 (JAM) 718 960-1830 (ARM)
Office	GIllet Hall, Room 325 (JAM) Gillet Hall, Room 323 (ARM)
Office hours	Wednesdays, 2:00-4:00 PM and by appointment (JAM) Wednesdays, 3:30-5:30 PM and by appointment (ARM)
Required books	- Shaw, Dorling, Mitchell, 2001. Health, Place, and Society (Open Access book - will be available in pdf on Blackboard) - Koch, T., 2005. Cartographies of Disease: Maps, Mapping, and Medicine, ESRI Press - Gatrell, A. and Elliott, S., 2009. Geographies of Health, 2nd Edition, Wiley-Blackwell All other chapters and papers will be provided in pdfs on Blackboard. Each week pertinent websites and blog postings will be provided on Blackboard for further background and introductory information to that week's topic.
Recommended books	N/A
Reserve material	N/A
Other required materials	Access to a computer able to run ArcGIS (windows OS or MAC with a Windows emulator). Administrative rights or ability to install software.

Assessment
Your understanding of the course material will be evaluated through weekly writing assignments, GISc labs, participation during face-to-face meetings as well as online discussion boards, and a final exam.

Course policies [such as]
Grading

		(Dates, if applicable)
35 %	Lab Assignments	
35 %	Written Assignments	
20 %	Final Exam	
10 %	Participation	
100%		

Course Format:
This is a hybrid on-line course, meeting once per month for in-class discussions in a seminar format. On-line assignments include reading, written responses to questions, GISc lab assignments, discussion forum, and web-based research. At the conclusion of the course, there will be a take-home Final Exam, worth 20% of the total final grade for the course.

Grading Policy:
Grades will not be curved, there will be no extra credit, and no grades will be dropped.

Class Participation:
Class participation includes engagement in discussions and answering of questions during the in-class meeting seminars. Since the class meets as a group only once per month, promptness and attendance at these meetings is imperative. Lateness and absence will count against this grade. Class participation also includes appropriate timeliness and proper format in communications, and weekly discussion board submissions, and accounts for 15% of the final grade.

Lab Assignments:
Lab assignments consist of GISc labs or research that may be completed in the GISc Lab during open lab periods, or as take-home work (most likely both). Student copies of the relevant GISc software will be provided to be installed on the home computers. *All assignments must be uploaded to Blackboard by the due date and times stated in the syllabus in order to receive credit.* Labs must be saved as a word
document, an image file, and/or PDF. The documents must be saved as
LastName_FirstName_LabName
(e.g. Smith_Joe_Lab1.doc). Lab assignments count for 35% of the total final grade.

Written Assignments:
Each week there will be questions posted on Blackboard referring to the readings, web-based research, and GISc lab exercises for that week which will require responses from each student that must be uploaded to Blackboard by the due date and time. Responses are to be thorough,

succinct, and answer the question as completely as possible. Written assignments count for 35% of the total final grade.

Final Exam:
The Final Exam consists of essay questions taken directly from the Weekly Written Assignments. Therefore it is a good idea to formulate responses to ALL the Weekly Assignment questions, even though you only will need to write and submit on Blackboard only one response per week.

Student Preparation:
NOTE: Students in GEP 610/PHE 717/EES 79903 have varying levels of GIS skills and background knowledge. To ensure as far as possible that everyone is "on the same page," and to minimize the effort required to understand the topics of spatial analysis, simulation, and modeling to be covered in this course, students are urged to review the following material, especially as necessary to supplement any known or potential area of deficiency.
All students will be expected to have a grasp of the rudiments of map composition and graph design, a familiarity with general GIS theory, a reasonable understanding of basic statistics, and a working knowledge of ArcGIS software and Windows operating system.
For general information on thematic mapping, map composition, and chart design, review ***Cartography: Thematic Map Design***, by Borden Dent, (latest edition), McGraw Hill, New York, NY. See especially Chapters 13, 14, 15 and 18, regarding map composition, use of color, typeface selection, and graphing, and Chapters 4, 5, and 7, regarding thematic mapping. Chapter 6 is an excellent overview of GIS. This

book is available on reserve at the Lehman Library. Another good one on the topic is *Cartography: Visualization of Spatial Data*, by M.J. Kraak and F.J. Orneling, Pearson Education Ltd. Harlow, UK.
For an accessible and clear review of geostatistics, peruse ***An Introduction to Applied Geostatistics***, by
Edward Isaaks and R. M. Srivastava, 1989, Oxford University Press, Oxford, UK Concentrate on Chapters
1 through 4 on descriptive statistics. On reserve at Lehman Library. **Recommended GIS Workbook***:*
Mastering ArcGIS, 2005, McGraw-Hill, NY, NY
For an introduction to GIS theory and concepts, consult ***Geographical Information Systems and Computer Cartography,*** by Christopher Jones, 1997, Addison Wesley Longman, Ltd, Essex, UK; OR ***An Introduction to Geographical Information Systems***, by Ian Heywod, Sarah Cornelius, and Steve Carver, Prentice Hall/Addison Wesley Longman, Ltd., OR ***GIS for the Urban Environment***, by Juliana Maantay and John Ziegler, 2006, ESRI Press, Inc. (on reserve at Lehman Library.)

GISc Lab Etiquette:
The GISc Lab is available ONLY to students enrolled in GISc courses (and other EGGS Dept. courses at Lehman College and EES courses through the Graduate Center). Please be considerate of others when working in the lab. There is no eating or drinking allowed in the lab at any time, and no cell phone use, either. Please be respectful of other students trying to concentrate, and keep idle chatter to a minimum. When you arrive at the lab, sign in on the

sign-in sheet. This is very important in order to demonstrate that students are actually using the lab. Do not save your work to the desktop or hard drive of the computer: it will not be saved after you shut down the computer. Save your work (often!) to a flash drive or external hard drive which you should bring to class every time. At the end of your lab session, please shut down your computer and clean up your workstation area.
The lab is open every weekday and several evenings, (the lab schedule will be posted by the second week of the term) and the GISc Lab manager and GISc lab tutor will be available during some of those hours to help you, if you get stuck. They are NOT to be considered a substitute for learning the software and methods on your own, however, so you must still try to figure things out and not become overly reliant on others for help. And although collaborative work with your classmates is encouraged as a good way to accelerate the learning process and reinforce concepts, we expect individual work products for lab exercises and written assignments.

Course Policies:
Lateness and absences: Lateness or absence will count against your class participation grade unless there is an emergency or it is cleared with the professor in a timely fashion *before* class. If you miss a session, it is your responsibility to check with your classmates for notes and other course materials. Late submission of assignments or exams: Late assignments/exams will generally not be accepted unless it is cleared with the professor *well before the due date*. Under special circumstances, unexcused late assignments may be accepted (at the professor's discretion) but one full letter grade will be subtracted. If there is a medical reason for lateness, please supply documentation.
Blackboard: Blackboard will be used to distribute and update assignments, readings, and other course materials. It is the student's responsibility to check it regularly.
Cell phone use: The use of cell phones and other similar devices are not permitted during in-class seminar sessions.
Computers: Since the in-class seminars and the lab assignment work take place in a computer lab, the following additional rules apply: Monitors must be turned off during discussion seminars; No drinking or eating of any kind in the lab; No printing of any materials without permission from the instructor or the lab manager;
Incompletes: A grade of incomplete will **only** be considered if you are clearly making a good faith effort to complete the course (i.e., completing assignments regularly, participating in seminar discussions) and have a good reason for not completing the work (e.g. medical or family emergency). Lack of time- management skills is not a valid reason to be granted an incomplete. Incompletes must be arranged with the instructor IN ADVANCE of the end of the term, and must be completed by the required date, in accordance with College policy on completing coursework - within the following term for undergrads, and within one year for graduate students. Note that there are specific deadlines for the completion of incomplete grades (NOT merely the end of the next term or year), and you must check the Academic Calendar to find out which apply.
Dropping: The last day to drop the course with the grade of "WD" is February 17th (25% refund); Last day to drop a course with a "W" grade is April 16th (official withdrawal).

Academic dishonesty: Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, cheating, plagiarizing (including "cutting and pasting" or

paraphrasing information from the internet without proper citation), fabricating information or citations, facilitating acts of academic dishonesty by others, submitting work of another person or papers written for other courses, or tampering with the academic work of other students. Students may be asked to submit their notes and references to prove that their work is their own. For further clarification, please read CUNY's policy on academic integrity at http://www.lehman.edu/provost/documents/academic-integrity.pdf. Violators will be reported to the head of the Department and to the Dean of Student Affairs.

Accommodation for Students with Disabilities:
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Lehman College has two tutoring centers on campus. The ACE provides appointment-based and drop-in tutoring in the humanities, social sciences and writing, as well as general writing skills. The SLC provides drop-in tutoring for natural and computer science courses. To obtain more information about the ACE and SLC, please visit their website at http://www.lehman.edu/issp, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707.

SCHEDULE

*****In-Class Meeting, 4:00 – 6:00 PM, Friday, January 29th*****

Weekly Class Topics/Readings/Lab Exercises:

1. **History of health geography and the context of urban health – Part 1**

Readings:

- Shaw, Dorling, Mitchell, 2001. *Health, Place, and Society,* Chapter 1, Introduction; and Chapter 2, Health, Place and Society: An Historical Perspective, pp. 1-40.
- Koch, T., 2005. *Cartographies of Disease: Maps, Mapping, and Medicine*, Chapter 1, Mapping and Mapmaking, pp. 1-13.
- Hofrichter, R., ed., 2003. *Health and Social Justice,* Chapter 20, (Geronimus, A.) Addressing Structural Influences on the Health of Urban Populations, pp. 542-556.

Lab Assignment: No Lab

Week 1 Written Assignment Responses due 3:00 PM, Tuesday, February 2nd, and Reaction Comments due 3:00 PM, Wednesday, February 3rd

2. **History of health geography and the context of urban health – Part 2**

Readings:

- Koch, T., 2005. *Cartographies of Disease: Maps, Mapping, and Medicine*, Chapter 2, Medical Mapping: Early Histories; Chapter 3, Mapping and Statistics, 1830-1849; and Chapter 4, John Snow: The London Epidemics, pp. 15-103.
- Gatrell and Elliott, 2009. *Geographies of Health,* Chapter 1, Introducing Geographies of Health, pp. 3-22.

Lab Assignment A: A re-examination of John Snow's cholera map - NOW with MAUP!

Week 2 Written Assignment Responses due 3:00 PM, Tuesday, February 9th, and Reaction Comments due 3:00 PM, Wednesday, February 10th. Lab Assignment A due 3:00 PM Wednesday, February 10th

3. **Exploring and measuring urban exposures/methods – Part 1: Proximity and containment**

Readings:

- Shaw, Dorling, and Mitchell, 2001. *Health, Place, and Society*, Chapter 3, Mapping and Measuring, pp. 41-85.
- Maantay, J.A., 2002. Mapping Environmental Injustices: Pitfalls and Potential of Geographic Information Systems in Assessing Environmental Health and Equity, *Environmental Health Perspectives*, 110 (S2): 161-171.
- Maheswaran and Craglia, 2004. *GIS in Public Health Practice*, Chapter 7, Using GIS for Environmental Exposure Assessment: Experience from the Small Area Health Statistics Unit, pp. 109-124.
- Chakraborty, J., and Maantay, J.A., 2011. Proximity Analysis for Exposure Assessment in Environmental Health Justice Research, in Maantay and McLafferty, eds., *Geospatial Analysis of Environmental Health,* Chapter 5, pp. 111-138.

Lab Assignment B: Analyzing Exposure using Multiple Ring Buffers and Relative Risk

Week 3 Written Assignment Responses due 3:00 PM, Tuesday, February 16th, and Reaction Comments due 3:00 PM, Wednesday, February 17th. Lab Assignment B due 3:00 PM, Wednesday, February 17th

4. Exploring and measuring urban exposures/methods – Part 2: Exploratory Spatial Data Analysis –
interpolation methods and land use regression modeling

Readings:

- Gatrell and Elliott, 2009. *Geographies of Health*, Chapter 3, Method and Technique in the Geography of Health, pp. 49-84.
- Maroko, A., Maantay, J.A., and Grady, K., 2011. Using Geovisualization and Geospatial Analysis to Explore Respiratory Disease and Environmental Health Justice in New York City, Chapter 2 in Maantay, J.A. and McLafferty, S. 2011. *Geospatial Analysis of Environmental Health,* pp. 39-66.
- Maheswaran and Craglia, 2004. *GIS in Public Health Practice*, Chapter 8, Using Modeled Outdoor Air Pollution Data for Health Surveillance, pp. 125-149.
- Setton, E., et al., 2011. Outdoor Air Pollution and Health – A Review of the Contributions of Geotechnologies to Exposure Assessment, in Maantay and McLafferty, eds., *Geospatial Analysis of Environmental Health,* Chapter 3, pp. 67-91.

Lab Assignment C: Exploring Exposure and Environmental Justice using Interpolation

Week 4 Written Assignment Responses due 3:00 PM, Tuesday, February 23rd, and Reaction Comments due 3:00 PM, Wednesday, February 24th (No Lab Assignment due)

*****In-Class Meeting, 4:00 – 6:00 PM, Friday, February 26th*****

5. Issues of Equity: Environmental Justice and Health Disparities

Readings:

- Shaw, Dorling and Mitchell, 2001. *Health, Place, and Society,* Chapter 5, Health Inequalities: Composition or Context? pp. 126-154.
- Gatrell and Elliott, 2009. *Geographies of Health,* Chapter 4, Inequalities in Health Outcomes, pp. 87-123.
- Pastor, M., Sadd, J., Morello-Frosch, R., 2007. *Still Toxic After All These Years: Air Quality and Environmental Justice in the San Francisco Bay Area*. Center for Justice, Tolerance, and Community, University of California, Santa Cruz. 16 pages
- Grady, S., 2011. Housing Quality and Racial Disparities in Low Birth Weight: A GIS Assessment.
  Chapter 15 in Maantay and McLafferty, eds. *Geospatial Analysis of Environmental Health,* pp. 303-318.

Lab Assignment: Lab C Continues - Exploring Exposure and Environmental Justice using Interpolation

Week 5 Written Assignment Responses due 3:00 PM, Tuesday, March 1st, and Reaction Comments due 3:00 PM, Wednesday, March 2nd. Lab Assignment C due 3:00 PM, Wednesday, March 2nd.

6. Social and spatial patterning of health

Readings:

- Shaw, Dorling and Mitchell, 2001. *Health, Place, and Society,* Chapter 4, The Social and Spatial Patterning of Health, pp. 86-123; Chapter 6, Health and Social/Spatial Mobility, pp. 156-181.
- Angeles, G., et al., 2009. The 2005 census and mapping of slums in Bangladesh: design, select results and application. *International Journal of Health Geographics*, 8(32): 1-19.
- Bedi, T., Coudouel, A., Simler, K., eds., 2007. *More Than a Pretty Picture: Using Poverty Maps to Design Better Policies and Interventions,* The World Bank. **[NOTE: read Chapter 1, pages 3-22, and skim some of the country examples, pages 53-286 for the maps and graphic visualizations of data.]**
- Levy, J., et al., 2006. Incorporating concepts of inequality and inequity into health benefits analysis. *International Journal for Equity in Health*, 5(2): 1-19.

Lab Assignment D: GINI Index and Low Birth Weight: Comparing Regional Differences in Health Outcomes

Week 6 Written Assignment Responses due 3:00 PM, Tuesday, March 8th, and Reaction Comments due 3:00 PM, Wednesday, March 9th. Lab Assignment D due 3:00 PM, Wednesday, March 9th

7. **Accessibility to the Benefits of the Urban Environment**

Readings:

- Oliver, L., Schuurman, N., and Hall, A.W., 2007. Comparing circular and network buffers to examine the influence of land use on walking for leisure and errands. *International Journal of Health Geographics,* 6(41): 1-11.
- Miyake, K., Maroko, A., Grady. K., Maantay, J., Arno, P., 2010. Not just a Walk in the Park:
  Methodological Improvements for Determining Environmental Justice Implications of Park Access in New York City for the Promotion of Physical Activity. *Cities and the Environment*, 3(1): Article 8 (17 pages).
- Weiss, R., Maantay, J.A., Fahs, M., 2010. Promoting Active Urban Aging: A Measurement
  Approach to Neighborhood Walkability for Older Adults. *Cities and the Environment*, 3(1):Article 12 (17 pages).
- Rundle, A., Neckerman, K., Lance Freeman, Lovasi, G., Purciel, M., Quinn, J., et al., 2008.
  Neighborhood Food Environment and Walkability Predict Obesity in New York City. *Environmental Health Perspectives,* 117(3): 442-447.

Lab Assignment E: The Relationship between Health and Accessibility to Urban Parks using Network Analysis

Week 7 Written Assignment Responses due 3:00 PM, Tuesday, March 15th, and Reaction Comments due 3:00 PM, Wednesday, March 16th. Lab Assignment E due 3:00 PM, Wednesday, March 16th.

8. **The Influence of Residential Segregation: Using Indices of Segregation**

Readings:

- Laveist, T.A., Gaskin, D., and Trujillo, A.J., 2011. *The Effects of Racial Segregation on Health*
  Inequalities. Joint Center for Political and Economic Studies, 40 pages.
- Massey, D., and Denton, N., 1988. The Dimensions of Residential Segregation. *Social Forces,* 67 (2): 281-315.
- Wong, D., 2005. Formulating a General Spatial Segregation Measure. *The Professional*
  Geographer, 57(2): 285-294.

- Johnston, R., et al., 2009. Research Note – Measuring Ethnic Residential Segregation: Putting Some More Geography In. *Urban Geography*, 30(1): 91–109.

Lab Assignment F: Inter-Urban Comparison using Segregation Indices

Week 8 Written Assignment Responses due 3:00 PM, Tuesday, March 22nd, and Reaction Comments due 3:00 PM, Wednesday, March 23rd (No Lab Assignment Due)

Association of American Geographers (AAG) / International Society of Urban Health (ISUH) Meeting March 29th – April 4th, 2016

9. **Physical and Social Vulnerabilities**

Readings:

- Maantay, J.A., Maroko, A.R., and Culp, G., 2010. Using Geographic Information Science to Estimate Vulnerable Urban Populations for Flood Hazard and Risk Assessment in New York City, in Showalter, P., and Lu, Y. eds., *Geotechnical Contributions to Urban Hazard and Disaster Analysis,* Chapter 5, pp. 71-97, Springer-Verlag.
- Gatrell and Elliott, 2009. *Geographies of Health,* Chapter 9, Health Impacts of Global Environmental Change, pp. 218-35.
- Freudenberg, N., Saegert, S., and Klitzman, S., eds., *Urban Health and Society: Interdisciplinary Approaches to Research and Practice*, Chapter 9, How Vulnerabilities and Capacities Shape Population Health after Disasters, pp. 217-237.
- Maantay, J.A., and Becker, S., 2012. The Health Impacts of Global Climate Change: A Geographic Perspective. *Applied Geography*, 33: 1-3.
- Pearce et al, 2010. Environmental Justice and Health: The Implications of the Socio-Spatial Distribution of Multiple Environmental Deprivation for Health Inequalities in the United Kingdom. *Transactions of the Institute of British Geographers* 35:522-539.
- Tate, E. (2012). Social Vulnerability Indices: A Comparative Assessment Using Uncertainty and Sensitivity Analysis. *Natural Hazards* 63, pp. 325-347.

Lab Assignment: Lab F continues - Inter-Urban Comparison using Segregation Indices

Week 9 Written Assignment Responses due 3:00 PM, Tuesday, April 5th, and Reaction Comments due 3:00 PM, Wednesday, April 6th. Lab Assignment F due 3:00 PM, Wednesday, April 6th.

*****In-Class Meeting 4:00 – 6:00 PM, Friday, April 8th*****

10. **Social and environmental stressors and disease outcomes**

Readings:

- Maantay, 2013. The Collapse of Place: Derelict Land, Deprivation, and Health Inequality in Glasgow, Scotland. *Cities and the Environment*, 6(1):Article 10 – 54 pages.
- Maroko, A.R., Riley, R., et al, 2013. Direct observation of neighborhood stressors and environmental justice in the South Bronx, New York City. *Population and Environment*. (20 pages)
- Ellaway, A., Morris, G., Curtice, J., Robertson, C., Allardice, G., and Robertson, R., 2009. Associations between health and different types of environmental incivility: A Scotland-wide study. *Public Health, 123:* 708–713.
- Downey, L., and Van Willigen, M., 2005. Environmental Stressors: The Mental Health Impacts of Living Near Industrial Activity. *Journal of Health and Social Behavior*, 46(3): 289–305.

Lab Assignment G: Geographically Weighted Regression (GWR) Analysis: Effect of Vacant Land and Deprivation on Mental Health

Week 10 Written Assignment Responses due 3:00 PM, Tuesday, April 12th, and Reaction Comments due 3:00 PM, Wednesday, April 13th (No Lab Assignment Due)

11. **Urban planning and health – "Designing Healthy Communities"**

Readings:

- Maantay, 2004. Industrial Zoning Changes in New York City: A Case Study of "Expulsive Zoning,"*MIT Projections,* pp. 63-108.
- Lauri Andress, 2009. *Healthy Urban Planning: The Concept, Tools, and Application,* pp. 1-48.
- Barton, et al, 2003, *Healthy Urban Planning in Practice: Experience of European Cities,* World Health Organization.
- De Zeeuw, H., 2004. *The Development of Urban Agriculture*. Keynote paper for the International Conference "Urban Agriculture, Agro-Tourism, and City Region Development," Beijing, October 10-14, 2004.
- Ottmann, M., Maantay, J. A., Grady, K., and Fonte, N., 2012. Characterization of Urban Agricultural Practices and Gardeners' Perceptions in Bronx Community Gardens, New York City. *Cities and the Environment,* 5(1): Article 13. (25 pages)

Lab Assignment: Lab G continues - Geographically Weighted Regression (GWR) Analysis: Effect of Vacant Land and Deprivation on Mental Health.

Week 11 Written Assignment Responses due 3:00 PM, Tuesday, April 19th, and Reaction Comments due 3:00 PM, Wednesday, April 20th. Lab Assignment G due 3:00 PM, Wednesday, April 20th

SPRING BREAK, APRIL 22nd – April 30th

12. **Spread of Disease** - **Part 1: Spatial Diffusion, Clustering, and Spatio-temporal Analysis**
Readings:
    - Koch, T., 2005. *Cartographies of Disease,* Chapter 10, Complex Processes: Diffusion and Structure, pp. 240-282.
    - McLafferty and Cromely, 2002. *GIS and Public Health.* Chapter 5, Analyzing Spatial Clustering of Health Events, pp. 130-157; and Chapter 7, Analyzing the Risk and Spread of Infectious Diseases, pp. 188-209.
    - Pathak, E.B., Reader, S., Tanner, J.-P., and Casper, M.L., 2011. Spatial clustering of non- transported cardiac decedents: the results of a point pattern analysis and an inquiry into social environmental correlates. *International Journal of Health Geographics*, 10(46): 1-11.
    - Carlos, H., et al., 2010. Density estimation and adaptive bandwidths: A primer for public health practitioners. *International Journal of Health Geographics,* 9(39): 1-8.
    - Chaikaew, N., et al. 2009. Exploring spatial patterns and hotspots of diarrhea in Chiang Mai, Thailand. *International Journal of Health Geographics,* 8(36): 1-10.

    Lab Assignment H: Exploring the Spatial Variation of Noise Complaints using Cluster Analysis and Kernel Density Estimation.

    Week 12 Written Assignment Responses due 3:00 PM, Tuesday, May 3rd, and Reaction Comments due 3:00 PM, Wednesday, May 4th (No Lab Due)

13. **Spread of Disease - Part 2: Spatial Diffusion, Clustering, and Spatio-temporal Analysis**
Readings:
    - Koch, T., 2005. *Cartographies of Disease,* Chapter 11, GIS and Medical Mapping, pp. 253-326.
    - Gatrell and Loytonen, 1998. *GIS and Health*, Chapter 7, GIS, Time Geography, and Health, pp. 97-110.
    - Qi, F., and Du, F., 2013. Tracking and visualization of space-time activities for a micro-scale flu transmission study. *International Journal of Health Geographics*, 12:6, pp. 1-16.
    - Duczmal L.H., et al. 2011. Voronoi distance based prospective space-time scans for point data sets: a dengue fever cluster analysis in a southeast Brazilian town. *International Journal of Health Geographics,* 10:29 pp. 1-14.
    - Corner, R., et al., 2013. Modelling typhoid risk in Dhaka Metropolitan Area of Bangladesh: the role of socio-economic and environmental factors. *International Journal of Health Geographics*, 12:13, pp. 1-15.

    Lab Assignment: Lab H continues - Exploring the Spatial Variation of Noise Complaints using Cluster Analysis and Kernel Density Estimation.

Week 13 Written Assignment Responses due 3:00 PM, Tuesday, May 10th, and Reaction Comments due 3:00 PM, Wednesday, May 11th Lab Assignment H due 3:00 PM Wednesday, May 11th

*****In-Class Meeting, 4:00 – 6:00 PM, Friday, May 13th*****

14. Analyzing Historical Health Data

Readings:

- Shaw, Dorling, Mitchell, 2001. *Health, Place, and Society,* Chapter 7, Putting Research into Context: From Cholera to Good Health for All, pp. 182-208.
- Kuo, C.-L., and Fukui, H., 2007. Geographical structures and the cholera epidemic in modern Japan: Fukushima prefecture in 1882 and 1895. *International Journal of Health Geographics*, 6:25, pp. 1-10.
- Curtis, A., 2008. Three-dimensional visualization of cultural clusters in the 1878 yellow fever epidemic of New Orleans. *International Journal of Health Geographics*, 7:47, pp. 1-10.
- Séguy, I., et al., 2012. A geographic information system for the study of past epidemics: The 1705 epidemic in Martigues (Bouches-du-Rhône, France), "Historical Studies on Mortality," special issue, Canadian Studies in Population, 39(3–4): 107–122.
- Chandra. S., et al., 2013. A geographic analysis of population density thresholds in the influenza pandemic of 1918– 19. *International Journal of Health Geographics*, 12:9, pp. 1-10.

Lab Assignment: No Lab

Week 14 Written Assignment Responses due 3:00 PM, Tuesday, May 17th, and Reaction Comments due 3:00 PM, Wednesday, May 18th (No Lab Due)

15. Final Exam *(take-home exam, during Final Exam Week)* ***Due Wednesday, May 25th by 3:00PM***

Geographic Information Science Specialization Competencies	Course Learning Objectives	Assessment Methods
This course will help you achieve increased competency in geographic information science. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
Synthesize theories, methods, and practice of public health GISc	- Review and evaluate peer-review articles concerning GISc and urban health.	All written assignments and lab assignments
3. Interpret and analyze cartographic information	- Perform geographically weighted regression, index creation, and other intermediate and advanced GISc functions to analyze urban health data. - Create and interpret cartographic products using intermediate and advanced GIS methods for urban health	All written assignments and lab assignments
Analyze geographic health data in terms of spatial distribution and associations with other variables	- Create and interpret cartographic products using intermediate and advanced GIS methods for urban health - Perform geographically weighted regression, index creation, and other intermediate and advanced GISc functions to analyze urban health data.	Lab assignments A, B, C, D, E, G, and H
Identify, estimate, and analyze environmental exposures and evaluate their impacts on public health and social inequality	- Perform geographically weighted regression, index creation, and other intermediate and advanced GISc functions to analyze urban health data. - Create and interpret cartographic products using intermediate and advanced GIS methods for urban health	Written assignments for weeks 1, 2, 3, 4, 5, 7, 9, and 10 Lab assignments A, B, C, E, and G
Effectively communicate geographic health information through oral, written and visual presentations	- Create and interpret cartographic products using intermediate and advanced GIS methods for urban health	All written assignments and lab assignments

GISc SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

PHE 718
Geostatistics & Spatial Analytical Concepts
(3.0 credits, 4.0 hours)
Spring 2016

Catalogue description	Emerging fields of geospatial statistics, applying quantitative techniques to real-world geographic problems. Concepts and application of exploratory spatial data analysis (ESDA), traditional statistics and geospatial statistics within various software packages, including GeoDa, ArcGIS, [R], and Excel.
Course meets	Wednesday 6:00 – 9:30 PM
Instructor	Glen Johnson, PhD, MS, MA
Email	glen.johnson@lehman.cuny.edu (best mode of communication)
Office **Office hours**	322 Gillet Hall, Lehman College Wednesdays from 3:30-5:00 PM and Thursdays from 11:30-1:00 PM or by appointment (email)
Course Format:	This course includes lectures, discussions, computer labs, readings, assignments, quizzes and final exam.
Required books	Geospatial Analysis, 5th Edition. de Smith, Goodchild, Longley (2015). Available for free on-line access at http://www.spatialanalysisonline.com/HTML/index.html Additional readings will be provided via blackboard and other internet web sites.

Assessment

Grading Policy:
Grades will not be curved, there will be no extra credit and no grades will be dropped.

Components of Final Grade:	
5%	class participation
50%	Assignments
30%	Term Project
5%	Mid-Term Quiz
10%	Final Exam
100%	

Class Participation:
Class participation includes engagement in discussions and answering of questions during lecture. Lateness and absence will count against this part of the grade.

Assignments:
Assignments, which account for 50% of the final grade, consist of in-class and take-home work. They include data compilation and analysis using various software, plus interpretation of results. Assignments will be submitted by their respective due dates as brief write-ups with appropriate tables, maps and other graphics as needed.

All assignments must be emailed *before* the scheduled class time on the due date to receive credit. Written assignments must be saved in either PDF format or as a WORD document (.DOC or .DOCX), having 1" margins, 1.5" spacing, 12 point fonts, and be saved as ***LastName_FirstName_AssignmentName*** (e.g. Smith_Joe_Assignment1.doc). The email containing the file should be titled with the course number followed by the student name and assignment name (e.g. **GEP630, Joe Smith, Assignment 1**).

Testing:
A midterm quiz, worth 5% of the final grade, will be done as an open-book, online exercise.
A comprehensive final exam, worth 10% of the final grade, will be taken in-class during final exam week.

Term Project:
The term project counts towards 30% of the final grade. While students are encouraged to work together to help one another, each student is required to present an independent project to the class towards the end of the semester, following a similar format as a conference presentation. All students must also submit their presentation electronically, such as a power point or pdf file. The presentation and supporting documentation must follow the structure of 1) Introduction, 2) Methods, 3) Results, 4) Conclusions 5) Cited references and acknowledgements. Each project will be graded according to the rubric outlined below, for a total of 12 points (12/12 = full grade).

	Beginning 1	Developing 2	Accomplished 3	Exemplary 4
Maps and other Graphics	incomplete or are not relevant to data presented	appropriate, but are lacking accuracy	appropriate for data; overall presentation is acceptable, but with minor errors	appropriate for the data, clearly presented and easy to interpret; with no errors
Statistics	Incomplete, incorrect or inappropriate statistics presented	Appropriate statistical methods, but incorrect results	Appropriate statistical methods and results, but with minor errors	Appropriate statistical methods and results, with no errors
Presentation and/or Report	Incomplete, unorganized, and difficult to follow	Communicates some important information, with major omissions; not organized well	Communicates important information, with acceptable organization	Communicates important information; well organized; clear scientific language used

Course policies

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Late submission of assignments or exams: Late assignments/exams will generally not be accepted unless it is cleared with the professor *well before the due date*. Under special circumstances, unexcused late assignments may be accepted (at the professor's discretion) but one full letter grade will be subtracted. If there is a medical reason for lateness, please supply documentation.

Blackboard: Blackboard will be used for announcements and to distribute assignments, readings, and other course materials. It is the student's responsibility to check it regularly.

Use of Personal Communication Devices: The use of cell phones and other portable communication devices are not permitted during class.

Computers: Room 322 Gillet Hall is a computer lab where the following rules apply:

- During lectures, computers can only be used for following the presentation on power point or for taking notes. Non-class uses, such as checking personal email and personal web browsing, will reduce the "class participation" component of your final grade (the instructor will know!).
- No drinking or eating of any kind in the lab.
- **NO PRINTING OF ANY MATERIALS WITHOUT PERMISSION FROM THE INSTRUCTOR OR THE LAB MANAGER!**

Syllabus Modification: The instructor may modify the syllabus and study plan.

Institutional policies

Incompletes: A grade of incomplete will **only** be considered if you are clearly making a good faith effort to complete the course (i.e., attending regularly, participating in discussions) and have a good reason for not completing the work.

Dropping: the last day to drop the course with the grade of "W" is April 16 (no refund)

Academic dishonesty: Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, cheating, plagiarizing (including "cutting and pasting" or paraphrasing information from the internet without proper citation), fabricating information or citations, facilitating acts of academic dishonesty by others, submitting work of another person or papers written for other courses, or tampering with the academic work of other students. Students may be asked to submit their notes and references to prove that their work is their own. For further clarification, please read CUNY's policy on academic integrity at http://www.lehman.edu/lehman/about/policies_pdf/CUNYAcademicIntegrityPolicy.pdf. Violators will be reported to the head of the Department and to the Dean of Student Affairs.

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Lehman College has two tutoring centers on campus. The ACE provides appointment-based and drop-in tutoring in the humanities, social sciences and writing, as well as general writing skills. The SLC provides drop-in tutoring for natural and computer science courses. To obtain more information about the ACE and SLC, please visit their website at http://www.lehman.edu/issp, or call the ACE at 718-960-8175, and the SLC at 718-960-7707.

Important Dates

Feb 4= Last day to drop with 75% tuition refund; **Feb 11**= Last day to drop with 50% tuition refund; **Feb 18** = Last day to drop with 25% tuition refund and last day to drop without the grade of "W"; **April 11** = Last day to withdraw with grade of "W" (no refund)

Schedule:
-Readings are to be done *before* the class for which they are assigned (e.g. the readings for session 3 should be done in advance of session 3, etc.). "GA" refers to "Geospatial Analysis, 5th Edition. de Smith, Goodchild, Longley. (available at http://www.spatialanalysisonline.com/HTML/index.html)
-Assignments are due on the dates that they are posted in the schedule below.
-The schedule, readings, and assignments are *subject to change* by the instructor.

Session	**Date**	**Topic**	**Readings**	**Assignments** (due date)
1	2/3	- Introduction to topic and software - Review of basic statistical concepts		Download / install / familiarize with GeoDa and SatScan
2	2/10	Data quality considerations and Introduction to spatial smoothing methods	GA, Chaps. 1,2,3, 5.1, 5.2, 5.5; Boscoe and Pickle, 2003; Rushton, 2003	Lab 1: ESDA and basic smoothing of thematic maps (due 2/17)
3	2/17	Cluster Detection 1: Point Pattern Analysis	GA, Chaps. 5.4	Lab 2: Point Pattern Analysis (due 2/24)
4	2/24	Cluster Detection 2: Spatial Lattice Patterns	SatScan manual; GA, Chap. 5.2.6;	Lab 3, part 1: Lattice Cluster Analysis (due 3/2)
5	3/2	Cluster Detection 3: Spatio-temporal Patterns	SatScan manual; Kulldorf et al 2005 Recuenco et al 2007	Lab 3, part 2: Lattice Cluster Analysis (due 3/9)
6	3/9	Geostatistcs 1: Variograms	GA, Chap 6.6.1; 6.7.1	Lab 4, part 1: Geostatistics (due 3/16)
7	3/16	Geostatistcs 2: Kriging **Mid-term quiz**	GA, Chap 6.7.2	Lab 4, part 2: Geostatistics (due 3/23)
8	3/23	Measuring Spatial Associations 1: Ordinary Least Squares and Geographically Weighted Regression	GA, Chap 5.6.1; 5.6.2; 5.6.3	Lab 5, part 1: Spatial Regression (due 4/6)
	3/30	**NO CLASS**		
9	4/6	Measuring Spatial Associations 2: Spatial Regression	GA, Chap 5.6.4; Johnson and Lu 2011 Johnson 2004 (optional)	Lab 5, part 2: Spatial Regression (due 4/13)
10	4/13	Measuring Spatial Associations 3: Cluster Detection Revisited (with covariates)		Lab 6: Covariate-adjusted Cluster Detection (due 4/20)
11	4/20	Review		
	4/27	**SPRING BREAK**		
12	5/4	in-class work on term projects and student presentations		
13	5/11	Term Project student presentations		
14	5/18	Term Project student presentations		
15	5/25	**Final Exam**		

Geographic Information Science Specialization Competencies	Course Learning Objectives	Assessment Methods
This course will help you achieve increased competency in geographic information science. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
Synthesize theories, methods, and practice of public health GISc	Know when and how to apply quantitative geospatial analysis for helping to solve the information needs that arise from real-world challenges, particularly from environmental and public health issues.	Assignments and Term Project
Interpret and analyze cartographic information	Understand the limitations of geospatial analysis, especially the potential for different, conflicting, messages that depend on choice of mapping and analysis parameters	Assignments, Mid-term quiz, Term Project and Final Exam
Analyze geographic health data in terms of spatial distribution and associations with other variables	Identify and apply appropriate statistical methods to accompany maps and other graphical presentations of data in order to objectively determine the significance of geospatial and spatiotemporal patterns and associations	Assignments, Mid-term quiz, Term Project and Final Exam
Create professional maps to present public health information and data in ways that are appropriate to the audience	Clearly present geospatial patterns of quantitative measurements through thematic and other types of symbolic mapping, using appropriate cartographic techniques	Assignments and Term Project
Effectively communicate public health information through oral, written and visual presentations.	Present geospatial analyses through a written paper and/or an oral presentation that clearly and concisely expresses a problem, the methodology to address the problem, the analytical and graphical results, and finally to summarize and explain the meaning of results in plain language for a mixed audience.	Term Project

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS
PHE 770: Supervised Fieldwork in Public Health
3 Credits
Spring 2016

Time and location	Selected Wednesdays, 6-8:40pm Lehman College, location TBA
Instructor	Emma K. Tsui, PhD, MPH emma.tsui@lehman.cuny.edu (preferred mode of communication) 347-577-4038 Gillet Hall, Room 422D
Office hours	Wednesdays 4-5:45pm (walk-in) and other times by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available. Lehman's Academic Center for Excellence (ACE) provides appointment-based and drop-in tutoring and general writing and academic skills workshops. To obtain more information about the ACE, please visit http://www.lehman.edu/issp or call the ACE at 718-960-8175.
Course description	Students carry out 180 hours of supervised fieldwork that is intended to bridge academic preparation and public health practice. Knowledge and skills from the core MPH and specialization courses are applied in a public health agency, community organization or other setting relevant to the student's academic background, specialization and career expectations. This is accomplished under the supervision and guidance of an experienced preceptor. Field-based hours are implemented with classroom and individual meetings along with online communication.
Course prerequisites	For CBPHHE students: PHE 710 and PHE 715 For GIS students: PHE 705 and PHE 706
Course format	Hybrid with 5 in-person meetings
Required reading and resources	Any required readings and resources will be posted on Blackboard.
Suggested reading and resources	Any suggested readings and resources will be posted on Blackboard.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Apply the public health core functions of assessment, policy development and assurance	• Discuss the application of assessment, assurance and/or policy development during the fieldwork experience.	• In-class discussion • Reflection paper
2. Apply theories, concepts, models and methods to the design of public health research, policy and practice	• Demonstrate through self-reflection activities the application of one or more core public health values or techniques through the fieldwork experience.	• In-class discussion • Progress reports • Reflection paper
3. Adhere to ethical and social justice principles and standards	• Apply ethical principles to fieldwork placement (e.g., human subjects' protection principles to data collection). • Assess the degree to which the fieldwork placement agency adheres to ethical principles and standards.	• CITI completion report • Progress reports • Preceptor evaluation of internship form • Student evaluation of internship form
4. Communicate public health information through oral, written, digital and visual presentation	• Prepare written and oral progress and evaluation reports using appropriate professional formats.	• All course assignments

5. Design and evaluate interventions to prevent or control public health problems	• Participate, through the fieldwork experience in developing, carrying out or evaluating a public health program, remediation measure, or policy.	• Reflection paper • Deliverables
6. Engage and collaborate with diverse groups	• Identify different stakeholders and evaluate their roles in the fieldwork project.	• In-class discussion • Progress reports • Reflection paper
7. Apply a framework for the planning, implementation and evaluation of public health programs, policies and interventions	• Explain the difference between key planning constructs and demonstrate the ability to incorporate them in planning, implementing and evaluating the fieldwork project	• Logic models • Reflection paper

Course Assessments
Five aspects of your performance in the course will be assessed. These aspects are described in more detail in the rubric posted to our Blackboard site:

1. Quality of Writing & Communication (30%)
2. On-Time Submission of Assignments (10%)
3. Constructive Resolution of Problems (10%)
4. Participation (20%)
5. Quality of Work for the Site (30%)

I will assess these based on your work and performance in the class sessions and on the course's written assignments. The written assignments for the course are listed below. Forms and guidelines for all of these are available via our Blackboard site:

- Scope of Work (developed by student in consultation with preceptor and internship advisor)
- Letter of Confirmation
- CITI completion report
- 3 Progress Reports
- Internship Logic Models
- "Deliverable(s)" as identified in the Scope of Work
- Internship Reflection Paper
- Student Evaluation of Internship Experience Form
- Preceptor Midpoint & Final Evaluation of Internship Forms

Grading
Evaluation criteria

A rubric on our Blackboard site describes in detail how each of the aspects of performance will be assessed.

The relative weight of each course component is as follows:

Assessment	Weight
Quality of Writing & Communication	30%
On-Time Submission of Assignments	10%
Constructive Resolution of Problems	10%
Participation	20%
Quality of Work for the Site	30%
	100%

The grading system for the course follows guidance in the Graduate Bulletin:

Letter Grade	Quality Points	Percentage
A	4.0	93-100%
A-	3.7	90-92%
B+	3.3	87-89%
B	3.0	83-86%
B-	2.7	80-82%

C+	2.3	77-79%
C	2.0	73-76%
F, WU	0	<72%

Withdrawal

The grade of W (withdrawal without penalty) is assigned only when a graduate student *officially* withdraws from a course. Students must complete the withdrawal process themselves, since the procedure requires a signature. No faculty member or program adviser can withdraw a student from a course. When students withdraw without completing the withdrawal procedure, the grade of WU is assigned for the course. This grade counts as a failure in computing the cumulative Grade Point Average. Graduate students should refer to the Graduate Bulletin and academic calendar for more information.

Grade of incomplete

The grade of INC (incomplete coursework) is awarded only when the course requirement has not been completed for good and sufficient reasons and when there is a reasonable expectation that the student can successfully complete the requirements of the course. For an instructor to grant an INC, the student must have met the instructor's attendance requirements in the course and have a passing semester average. An INC grade that has not been made up will change to a FIN grade (failure to complete coursework), remains permanently on the record, and counts as an F in computing the Grade Point Average. Refer to the Graduate Bulletin for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Program Director in writing giving the factual reasons and basis for the complaint. A student who wishes to appeal a grade must initiate the process in the full semester following the one in which the contested grade was received. For further guidance, refer to the Graduate Bulletin.

Course Policies

Attendance and class participation

All members of the class are expected to actively participate in in-person class sessions and to complete assigned reading and other assigned activities prior to class. If you are going to be late or have to miss a class, please contact me via email as far in advance as possible. Points may be deducted for absences, tardiness, or leaving class early.

Late/incomplete submission of assignments

I expect that all assignments that are not to be completed in class will be submitted to me via email by 11:59pm on the assignment's due date. Assignments handed in after the due date without prior permission will have points deducted. If you anticipate the need to turn in work late, please contact me to negotiate a mutually acceptable submission plan in advance of the assignment's due date. Please do not ask for an extension on the due date of the assignment.

Make-ups, rewrites, and extra credit

There will be no make-ups or extra credit in this course. In the event that it is necessary, rewrites may be allowed.

Expectations of students

I expect the classroom to serve as a space of respect and collaborative learning and that the course assignments will help you to reflect on the skills and experiences you're acquiring at your internship site. To that end, I expect that:

- you will arrive on time and stay for the entire class
- you will not use cell phones during class, except during breaks
- you will visit our Blackboard site frequently, as that will be our primary way of communicating with one another outside of class. Class announcements and supplemental materials will be posted there frequently. Course announcements will also be sent out using the Lehman e-mail system. If you have any questions about your Lehman email address or your password, or if you have any problems accessing the site, please call the computer helpdesk at 718-960-1111.
- your writing for assignments will be of high quality, presented in a readable and consistent manner: double-spaced, typewritten, with one-inch margins all around, and proofread.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during in-class discussions
- Respond to student email within 24 hours Monday through Friday.
- Grading and feedback on assignments within 2 weeks of the due date.

Accessibility

Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, at 718-960-8441.

Academic integrity

The faculty and administration of Lehman College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Policy on Academic Integrity and the Lehman College procedure for implementing the policy can be found in the Graduate Bulletin.

Course Schedule
Please note that the schedule and assignments listed below are subject to change. Additional readings and handouts may be provided, and session topics and activities may be altered if necessary. All readings that are not part of the required text will be available via Blackboard. For important dates (e.g., course drop and withdrawal), please refer to Lehman's graduate academic calendar: http://www.lehman.edu/registrar/calendars.php.

	Date	Topic	Readings & Assignments
1	February 3rd	**6-7pm: Introduction to the Internship Course** • Description of processes, sessions, and assignments • Discussing sites and scopes of work • Discussing internship ideas and progress **7-8pm: Individual Meetings**	Scope of Work discussions should be underway or concluded.
2	February 10th	No class—individual meetings as needed	Scope of Work should be ideally submitted to emma.tsui@lehman.cuny.edu.
3	February 17th	No class—individual meetings as needed	
4	February 24th	**6-7pm: Internship Lessons Learned from 3rd Year Students** **7-8pm: Internship Logic Modeling**	1st progress report due via email by 11:59pm on 2/23.
5	March 2nd	No class—individual meetings as needed	
6	March 9th	No class—individual meetings as needed	Internship logic models due via email by 11:59pm on 3/8.

7	March 16th	**6-7pm: Linking Internships to Public Health Practice** • Discussion of where PH core functions, values, and tools fit into your internship. • Understanding personal strengths and challenges **7-8pm: Workplace Ethics** • Discussion of key stakeholders and ethical issues in your internship.	
	March 23rd	No class—classes follow a Friday schedule	2nd progress report and preceptor midpoint evaluation due via email by 11:59pm on 3/22.
8	March 30th	No class—individual meetings as needed	
9	April 6th	No class—individual meetings as needed	
10	April 13th	No class—individual meetings as needed	
11	April 20th	**6-7:30pm: Leveraging your MPH experience professionally** **7:30-8:30pm: Improving presentation skills**	3rd progress report due via email by 11:59pm on 4/19.
	April 27th	No class—spring break	
12	May 4th	No class—individual meetings as needed	
13	May 11th	No class—individual meetings as needed	

14	May 18th	**770 Wrap-Up Session** • Discuss internship progress • Discuss final requirements: preceptor's evaluation of the student, reflection paper, and final self-evaluation. • Preparing for the capstone course • Lessons learned	
15	May 25th	No in-class final	Due by 11:59pm on 5/24: • Reflection paper • Internship deliverable(s) • Preceptor Final Evaluation • Student Evaluation of Internship Experience • CITI completion report

GISc SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

Lehman College

PHE 791: Workshop in GISc Research for Public Health

Spring 2016

Catalogue description	An advanced examination of mapping and of new computer-aided technologies in the natural and social sciences, including research design and methodology and designing and conducting an independent GIS public health research project, conforming to generally acceptable professional geographical practices and techniques, under the supervision of faculty. Pre-req: PHE 706 or departmental permission
Course meets	Gillet Hall, Room 311; Class Meeting Times: See below; Class participants will meet at least four scheduled times as a class, on Friday evenings, 6:30-9:00 PM, so as not to interfere with other scheduled classes, and individual meetings, as needed.
Instructor	Andrew Maroko, PhD
Email	Andrew.maroko@lehman.cuny.edu – email is the best way to reach me
Phone	(718) 960-1830
Office	Gillet Hall, Room 323
Office hours	Wednesdays, 3:30-5:30pm, and by appointment
Required books	- "An Introduction to Scientific Research Methods in Geography," by D. Montello and P. Sutton, Sage Publications, 2006. (Available at Lehman College Bookstore) - "Research Design and Proposal Writing in Spatial Science," by J. Gatrell, G. Bierly, and R. Jensen, Springer Publications. (Available on Blackboard)
Recommended books	N/A
Reserve material	N/A
Other required materials	Access to a computer which is capable of running ArcGIS in a windows environment (software provided).

Assessment
Your understanding of the course material will be evaluated through written submissions of your interim deliverables including project proposal, study design, preliminary maps as well as final deliverables including an oral presentation, PowerPoint slides, academic poster, and written report.

Course policies
Grading

15%	Week 5 deliverables
15%	Week 9 deliverables
30%	Oral presentation/slides
40%	Written report and poster
100%	

Course Format:
This is a hybrid on-line course, meeting once per month for in-class discussions in a seminar format.

Grading Policy:
Grades will not be curved, there will be no extra credit, and no grades will be dropped.

Student Preparation:
NOTE: Students in PHE 791 may have varying levels of GIS skills and background knowledge. To ensure as far as possible that everyone is "on the same page" students are urged to review the following material, especially as necessary to supplement any known or potential area of deficiency.
All students will be expected to have a grasp of the rudiments of map composition and graph design, a familiarity with general GIS theory, a reasonable understanding of basic statistics, and a working knowledge of ArcGIS software and Windows operating system.
For general information on thematic mapping, map composition, and chart design, review ***Cartography: Thematic Map Design***, by Borden Dent, (latest edition), McGraw Hill, New York, NY. See especially Chapters 13, 14, 15 and 18, regarding map composition, use of color, typeface selection, and graphing, and Chapters 4, 5, and 7, regarding thematic mapping. Chapter 6 is an excellent overview of GIS. This book is available on reserve at the Lehman Library. Another good one on the topic is *Cartography: Visualization of Spatial Data*, by M.J. Kraak and F.J. Orneling, Pearson Education Ltd. Harlow, UK.
For an accessible and clear review of geostatistics, peruse ***An Introduction to Applied Geostatistics***, by
Edward Isaaks and R. M. Srivastava, 1989, Oxford University Press, Oxford, UK Concentrate on Chapters
1 through 4 on descriptive statistics. On reserve at Lehman Library. **Recommended GIS Workbook***:*
Mastering ArcGIS, 2005, McGraw-Hill, NY, NY

For an introduction to GIS theory and concepts, consult ***Geographical Information Systems and Computer Cartography,*** by Christopher Jones, 1997, Addison Wesley Longman, Ltd, Essex, UK; OR ***An Introduction to Geographical Information Systems***, by Ian Heywod, Sarah Cornelius, and Steve Carver, Prentice Hall/Addison Wesley Longman, Ltd., OR ***GIS for the Urban Environment***, by Juliana Maantay and John Ziegler, 2006, ESRI Press, Inc. (on reserve at Lehman Library.)

GISc Lab Etiquette:

The GISc Lab is available ONLY to students enrolled in GISc courses (and other EGGS Dept. courses at Lehman College and EES courses through the Graduate Center). Please be considerate of others when working in the lab. There is no eating or drinking allowed in the lab at any time, and no cell phone use, either. Please be respectful of other students trying to concentrate, and keep idle chatter to a minimum. When you arrive at the lab, sign in on the sign-in sheet. This is very important in order to demonstrate that students are actually using the lab. Do not save your work to the desktop or hard drive of the computer: it will not be saved after you shut down the computer. Save your work (often!) to a flash drive or external hard drive which you should bring to class every time. At the end of your lab session, please shut down your computer and clean up your workstation area.

The lab is open every weekday and several evenings, (the lab schedule will be posted by the second week of the term) and the GISc Lab manager and GISc lab tutor will be available during some of those hours to help you, if you get stuck. They are NOT to be considered a substitute for learning the software and methods on your own, however, so you must still try to figure things out and not become overly reliant on others for help. And although collaborative work with your classmates is encouraged as a good way to accelerate the learning process and reinforce concepts, we expect individual work products for lab exercises and written assignments.

Course Policies:

Lateness and absences: Lateness or absence may count against your grade unless there is an emergency or it is cleared with the professor in a timely fashion *before* class. If you miss a session, it is your responsibility to check with your classmates for notes and other course materials.

Late submission of assignments or exams: Late assignments will not be accepted unless it is cleared with the professor *well before the due date*. Under special circumstances, unexcused late assignments may be accepted (at the professor's discretion) but one full letter grade will be subtracted. If there is a medical reason for lateness, please supply documentation.

Blackboard: Blackboard will be used to distribute and update assignments, readings, and other course materials. It is the student's responsibility to check it regularly.

Cell phone use: The use of cell phones and other similar devices are not permitted during in-class seminar sessions.

Computers: Since the in-class seminars and the lab assignment work take place in a computer lab, the following additional rules apply: Monitors must be turned off during discussion seminars; No drinking or eating of any kind in the lab; No printing of any materials without permission from the instructor or the lab manager;

Incompletes: A grade of incomplete will **only** be considered if you are clearly making a good faith effort to complete the course (i.e., completing assignments regularly, participating in

seminar discussions) and have a good reason for not completing the work (e.g. medical or family emergency). Lack of time-management skills is not a valid reason to be granted an incomplete. Incompletes must be arranged with the instructor IN ADVANCE of the end of the term, and must be completed by the required date, in accordance with College policy on completing coursework - within one year for graduate students. Note that there are specific deadlines for the completion of incomplete grades, and you must check the Academic Calendar to find out which apply.

Dropping: The last day to drop the course with the grade of "WD" is February 17th (25% refund); Last day to drop a course with a "W" grade is April 16th (official withdrawal).

Academic dishonesty: Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, cheating, plagiarizing (including "cutting and pasting" or paraphrasing information from the internet without proper citation), fabricating information or citations, facilitating acts of academic dishonesty by others, submitting work of another person or papers written for other courses, or tampering with the academic work of other students. Students may be asked to submit their notes and references to prove that their work is their own. For further clarification, please read CUNY's policy on academic integrity at http://www.lehman.edu/provost/documents/academic-integrity.pdf. Violators will be reported to the head of the Department and to the Dean of Student Affairs.

Accommodation for Students with Disabilities:

Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, tel #: 718-960-8441.

The Academic Center for Excellence (ACE) and the Science Learning Center (SLC):

Lehman College has two tutoring centers on campus. The ACE provides appointment-based and drop-in tutoring in the humanities, social sciences and writing, as well as general writing skills. The SLC provides drop-in tutoring for natural and computer science courses. To obtain more information about the ACE and SLC, please visit their website at http://www.lehman.edu/issp, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707.

Schedule

Week 1 – Meet to discuss course requirements, reading materials, and preliminary research concepts – Friday, January 29th, 2016

Weeks 1-4:

- Read: Montello and Sutton, Chapter 1 - Introduction: A Scientific Approach to Geography; Chapter 2 - Fundamental Research Concepts; Chapter 3 - Data Collection in Geography: Overview; Chapter 9 - Statistical Data Analysis; Read: Gatrell et al, Chapter 1 - Spatial Science and its Traditions; Chapter 2 - Literature Reviews; Chapter 3 - Research Questions; Chapter 4 - Data and Methods in Spatial Science.
- Select research topic, and conduct literature review on topic, examine other research on topic;
- Prepare written Initial Research Design, including hypothesis or questions to be answered;
- Conduct a Preliminary Data Needs Assessment and Data Acquisition;

Week 5 – Presentation of Preliminary Research Design and literature review – Friday, February 26th, 2016

WEEK 5 DELIVERABLES:

- One MSWord document uploaded to BB containing the following:
    - Short (one-pager) description of your narrowed-down project, including one or more laser-sharp, pin-pointed research questions;
    - List of data sets needed, including data sources and status of acquisition for each data set;
    - Flow Chart of project design (GIS analysis portion of project only);
- Be prepared to discuss your research design and literature review.

Weeks 5-8:

- Read: Chapter 10 - Data Display: Tables, Graphs, Maps, Visualizations; Chapter 11 - Reliability and Validity; Chapter 12 - Geographic Information Techniques in Research
- Refine research methodology;
- Capture and input necessary data;
- Preliminary data analysis;

Week 9 – Interim Progress Report on research projects – Friday, April 8th, 2016
(Association of American Geographers (AAG) meeting, March 29 – April 4)

WEEK 9 DELIVERABLES:

- One or more *map layouts* and one-pager on *preliminary findings* (uploaded to BB). Please include all maps and text in the same word document and be sure that there is enough text to explain what is being shown on the maps.

Weeks 9-12:

- Read: Chapter 13 - Scientific Communication in Geography; Chapter 14 - Ethics in Scientific Research;
- Analysis of data;
- Map and charts production;
- Prepare draft findings;
- Prepare Power Point or Prezi presentation of project background, methods, analysis, and conclusions.

Week 13 – Presentation of Research Results – Friday, May 13th, 2016

WEEK 13 DELIVERABLES:

- Oral Presentation of Project, via PowerPoint slides, Prezi, or other mode.
- Upload final PowerPoint Presentation of Project to BB.

Week 13-15:

- Prepare final maps and charts and written report of findings;
- Prepare large-format PowerPoint slide of poster of project.

Week 15 – Final Project Due (all materials to be submitted no later than Wednesday, May 25th, 2016)

WEEK 15 DELIVERABLES:

- Final Project Report (uploaded to BB) as a Word document;
- PowerPoint Slide of Large-format Poster of Project (uploaded to BB).

Geographic Information Science Specialization Competencies	Course Learning Objectives	Assessment Methods
This course will help you achieve increased competency in geographic information science. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
1. Analyze and interpret public health and GISc literature	- Review relevant GISc and public health literature	- Week 5 1-page project description/data needs/flow chart - Week 13 presentation - Week 15 final report and poster
2. Synthesize theories, methods, and practice of public health GISc	- Identify GISc methods appropriate to a public health research question - Design an appropriate research question and methodology	- Week 5 1-page project description/data needs/flow chart - Week 13 presentation - Week 15 final report and poster
3. Interpret and analyze cartographic information	- Review relevant GISc and public health literature	- Week 5 1-page project description/data needs/flow chart - Week 9 cartographic layout and preliminary findings report - Week 13 presentation - Week 15 final report and poster
4. Analyze geographic health data in terms of spatial distribution and associations with other variables	- Design an appropriate research question and methodology - Utilize spatial analysis to examine public health issues	- Week 5 1-page project description/data needs/flow chart - Week 9 cartographic layout and preliminary findings report - Week 13 presentation - Week 15 final report and poster

5. Create professional maps to present public health information and data in ways that are appropriate to the audience	- Create publication-quality cartographic products	- Week 9 cartographic layout and preliminary findings report - Week 13 presentation - Week 15 final report and poster
6. Understand, identify, and analyze health inequalities in terms of health outcomes based on geographic locations, socio-demographics, and economics	- Review relevant GISc and public health literature	Dependent on project
7. Identify, estimate, and analyze environmental exposures and evaluate their impacts on public health and social inequality	- Review relevant GISc and public health literature	Dependent on project
8, Understand, identify and analyze environmental justice issues and their impact on urban public health	- Review relevant GISc and public health literature	Dependent on project
9. Effectively communicate geographic health information through oral, written and visual presentations	- Create publication-quality cartographic products	- Week 5 1-page project description/data needs/flow chart - Week 9 cartographic layout and preliminary findings report - Week 13 presentation - Week 15 final report and poster

DRAFT -- Rev. 11/8/16

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 801: Interdisciplinary Approaches to Urban Health Research
3 Credits / Spring 2016

Time: Tuesdays 6:30 PM – 8:30 PM, January 29, 2016 – May 28, 2016

Location: GC – 365 5th Avenue room 8202

Instructors and Office Hours:
Nevin Cohen, Ph.D., Associate Professor, CUNY School of Public Health
55 West 125th Street, room 811, New York, NY 10027
212-646-8340 (T) 917-721-8037 (M)
nevin.cohen@sph.cuny.edu (preferred contact)
Wednesdays 3:00 to 6:00 or by appointment

Mary Clare Lennon, Ph.D., MS, Professor, CUNY PhD Program in Sociology and DPH Program in Public Health
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Tuesdays 1:00 to 3:00 or by appointment

Course Website: https://canvas.instructure.com/courses/992123

Support resources: For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are also available.

Course description:
This course prepares students to investigate causes of and solutions to complex urban health problems by bringing together concepts, theories and methods from a variety of disciplines that improve our understanding of urban health. It also focuses on research that contributes to reducing health disparities and promoting well-being in urban communities.

Prerequisites: PUBH 800

Course format: In-class seminar with guest lectures and some online discussions.

Required reading and resources: Required readings are listed in the class schedule.

Suggested reading and resources: Optional readings are listed on the course website.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify, develop, evaluate and recommend policy and programmatic interventions to improve population health at individual, community, government and country levels based on empirical evidence of social, political, cultural, biological, economic, historical, behavioral, environmental, and global factors in health and disease. *(Primary Competency)*	• Discuss the value and role of interdisciplinary approaches to measuring and analyzing public health problems. • Identify opportunities to incorporate different interdisciplinary frameworks, theories and methods in your health research. • Evaluate interdisciplinary public health research projects. • Recommend interdisciplinary approaches to policy and programmatic public health interventions.	• Participation in questions/answers and discussions with guest speakers • Online (written) observations about guest speakers and their research • In class discussions of frameworks, theories and methods • Final paper
Assess the mechanisms and pathways by which factors influence individual and population health. *(Primary Competency)*	• Identify the evidence for the mechanisms and pathways that influence health. • Describe and assess how these mechanisms and pathways are measured. • Design interdisciplinary measures of the mechanisms affecting public health. • Describe the methods by which mechanisms and pathways may be assessed.	• Participation in questions/answers and discussions with guest speakers • Online (written) observations about guest speakers and their research • In class discussions of frameworks, theories and methods • Final paper
Synthesize and apply methods, theories and data from multiple disciplines to	• Discuss: the underlying theories or frameworks and data or evidence	• Participation in questions/answers and discussions with guest

understand and solve population health issues. *(Primary Competency)*	presented to answer these questions, and the methods used to produce results and conclusions. • Describe strengths and weaknesses of basic and applied public health research with respect to theory, measurement, reliability and validity. • Assess the contributions and limitations of an interdisciplinary approach to addressing public health issues. • Evaluate the implications of research approaches to the development of intervention strategies.	speakers • Online (written) observations about guest speakers and their research • In class discussions of frameworks, theories and methods • Final paper
Design and conduct etiological, intervention, policy, implementation science and other empirical studies that contribute to new knowledge about population health. *(Reinforcing Competency)*	• Apply theories and methods from different disciplines to research about population health	• Participation in questions/answers and discussions with guest speakers • Online (written) observations about guest speakers and their research • In class discussions of frameworks, theories and methods • Final paper
Generate, translate, communicate, and disseminate population health evidence to diverse audiences. *(Reinforcing Competency)*	• Translate and communicate population health evidence derived from interdisciplinary research.	• Participation in questions/answers and discussions with guest speakers • Online (written) observations about guest speakers and their research • In class discussions of frameworks, theories and methods • Final paper
Demonstrate leadership skills to facilitate the goals of population health research and practice. *(Reinforcing Competency)*	• Organize, lead and convey the work of interdisciplinary teams to address population health	• Participation in questions/answers and discussions with guest speakers

	issues.	• Online (written) observations about guest speakers and their research • In class discussions of frameworks, theories and methods • Final paper

Course Assessments:

Course participation: This is a seminar-style course, which requires your active participation in class (and in online discussions). Each class session will include assigned readings, which we will discuss online and in periodic debriefing classes in which we will discuss the readings in relationship to presentations by guest speakers. Online participation is assessed based on the thoughtfulness of your own comments and the degree to which you engage in back and forth with your colleagues by reacting to, adding to, clarifying, or collegially disagreeing with their comments. In-class participation is assessed based on your verbal contributions, including questions asked, concepts clarified or expanded upon, and reactions to the comments and questions of colleagues. Online and in-person participation is rated categorically (excellent, very good, good, fair, poor/none).

Response Briefs: In addition to online and in-person discussions about the course material, you will be responsible for preparing six (6) concise memos in response to the presentations of 6 of the guest speakers. These memos will be the basis for our in-class or online discussions of the disciplinary, methodological and theoretical issues raised by the speakers. The exact format and style of the memos are up to you, but they should convey the following:

- The questions addressed by the speaker;
- The data or evidence brought to bear on these questions;
- The methods used to study the issue;
- The results and conclusions;
- Strengths and weaknesses of the work presented with respect to theory, measurement, reliability and validity;
- Connections to the course readings;
- The contribution(s) made by an interdisciplinary approach;
- Intervention strategies that derive from the research.

The six memos *together* should be no longer than approximately 5,000 words, meaning that each essay should be, on average, no longer than 4 pages, excluding references. Please use double spacing, 1" margins throughout and a 12-point font.

Final Paper: The final paper is a literature review (maximum 5,000 words) that explores a public health issue that you care deeply about and anticipate addressing in your doctoral research. Throughout the semester, you are expected to search for, read, and take notes on peer-reviewed journal articles from different disciplinary and methodological perspectives that address (define, measure, identify strategies for solving) this issue. Your

literature review will discuss how different disciplines define the issue, the theories they use to explain the issue, the methods they use to measure and describe the issue, efforts at interdisciplinary approaches to the issue, and any outcomes (intervention strategies, policies, impacts). You must discuss at least 2 different methodological/measurement approaches and 2 different conceptual/disciplinary perspectives. In your conclusions and discussion, please assess the contributions of the different approaches, limitations of these approaches in terms of theories, methods, and impacts, and suggestions for different ways to approach the issue. Please post any general questions about the assignment to the designated discussion thread on Canvas so that everyone else in the class is able to see our responses. Of course, if you have specific questions about your work, please feel free to discuss them with us during office hours.

Grading:

Evaluation criteria: Students who perform exceptionally in all aspects of the course will receive an "A." A grade of "B" will reflect adequate work. Any grade below a "B" will indicate that you should be performing better. All assignments must meet professional standards of analysis, presentation, and timeliness. Accurate spelling and grammar, and clear and concise writing, are critical. Assignments will not be accepted after they are due unless you have a compelling reason for being late (e.g., medical or family emergencies) and we agree to an alternate due date. The relative weight of each course component is:

Course Component	*Weight*
Class Participation	20%
Online discussions	20%
Response briefs	30%
Final Paper	30%

The grading system for the course follows guidance in the Graduate Bulletin:

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal: If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are generally permitted to officially withdraw from courses without academic penalty until the 10th week of class, but please check online for specific policies and dates for course withdrawal.

Grade of incomplete: The granting of an incomplete grade is at the discretion of the instructor. Incomplete final grades will not be granted unless the request is justified by

legitimate and documented emergencies. Refer to the Student Handbook for further details.

Grade appeals: When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies:

Attendance and class participation: You are required to attend every class that meets in person and to participate in every online discussion session. This is particularly important as we meet only once per week, and is extra-important in this class as we have invited a number of guest speakers who have given up their time to participate in the class. As noted above, we also expect active participation in class discussions.

Late/incomplete submission of assignments: As noted above, late or incomplete assignments will not be accepted unless you are ill or have a family emergency. If you know you will not be able to meet a deadline contact us as soon as possible to discuss an alternate deadline.

Make-ups, rewrites, and extra credit: The case study will be submitted in segments, as outlined in the course schedule. Each submission will be returned with comments and suggestions, and if these are addressed in the final submission your final grade will reflect your efforts at revising the paper throughout the semester. We do not offer extra credit assignments.

Expectations of students: One of the biggest obstacles to successful learning is not allocating sufficient time to coursework. We realize that DPH students are juggling multiple professional and personal responsibilities (including full time work for some of you) but we expect you to devote the time and energy required to learn the course material and to do a good job on the written projects. We also expect you to be the consummate professionals that you are – showing respect and treating each other collegially. In your interactions with us, please be open and communicative – please tell us if the course is not meeting your expectations so that we can make adjustments if possible. Whatever you do, please let us know if you are having trouble with the course. Other expectations include the following:

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and the academic calendar.
- Know how to use library resources and citation tools, and if unfamiliar please ask the CUNY librarians for assistance.
- Come to class fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date. No credit for work completed after the due date unless due to a medical or family emergency.

- No credit for assignments suspected of plagiarism. (See the Academic Integrity section below for the additional consequences of plagiarism.)
- Regularly check the course website and official university email for course correspondence. The readings and schedule are likely to change, and it is your responsibility to keep track.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and should be posted in the designated discussion board so that our responses are shared with the entire class.
- When in doubt, ask questions and clarify course assignments and expectations as far ahead of the due date as possible.

Expectations for the instructors: Our goal is to make this course a valuable learning experience that is intellectually interesting and challenging and relevant to your academic and professional work. You can expect us to be prepared each week, to make ourselves as accessible as possible, to return your work promptly (usually within one week) with comments and suggestions, and to treat each of you with respect and collegiality. We have high expectations and strict standards, but also try to be very reasonable if you express concerns or problems as they arise (and not at the very end of the term). Specifically, we will try to:

- Provide regular announcements, reminders, and suggestions on the course website.
- Monitor, ask follow-up questions, and answer questions presented during discussion.
- Respond to student email within 24 hours Monday through Friday.
- Communicate about grades and progress in the course through the course website.

Accessibility: Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For confidential information about such services, contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity: CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

This schedule is *likely to change* as the semester progresses because we are accommodating the schedules of a number of guest speakers. Please check the course website for updates, and post a question to the appropriate discussion board if you are unsure about scheduled topics/readings or assignments. Also refer to the current academic calendar for important university-wide dates.

	Date	Topic	Readings/Resources	Assessment
Part I: Introduction to the Course				
1	2/2/16	Personal introductions, overview of the course, and course requirements. Introduction to inter-disciplinarity and trans-disciplinarity, and their significance for urban health research and practice.	Haire-Joshu D, McBride TD, editors. *Transdisciplinary public health: research, education, and practice*. John Wiley & Sons; 2013 *Chapters 1, 5, 8*: • *Transdisciplinary Public Health: Definitions, Core Characteristics, and Strategies for Success*, Daniel Stokols, Kara L. Hall, Amanda L. Vogel • *Transdisciplinary Approaches: Sorting Out the Socioeconomic Determinants of Poverty and Health*, Timothy D. McBride, Lisa M. Pollack, Abigail R. Barker, Leah M. Kemper • *Evidence-Based Decision Making: Transdisciplinary Problem Solving to Improve the Health of the Public*, Ross C. Brownson	Class participation Online discussion
	2/9/16	No classes (Tuesday classes follow Friday schedule)		
2	2/16/16	Guest Speaker: Dean Ayman El-Mohandes Why theoretical frameworks matter: Theories and approaches for measuring describing, explaining, and eliminating health disparities	• El-Mohandes, A. A. E., Kiely, M., Gantz, M. G., & El-Khorazaty, M. N. (2011). Very preterm birth is reduced in women receiving an integrated behavioral intervention: A randomized controlled trial. *Maternal and Child Health Journal*, *15*(1), 19–28. • Joseph, J. G., El-Mohandes, A. A. E., Kiely, M., El-Khorazaty, M. N., Gantz, M. G., Johnson, A. A., … Subramanian, S. (2009). Reducing psychosocial and behavioral pregnancy risk factors: Results of a randomized clinical trial among high-risk pregnant African American women. *American Journal of Public Health*, *99*(6), 1053–1061. • Carpiano, R. M. & Daley, D. M. (2006). A Guide and Glossary on Post-Positivist Theory-Building for Population Health. Journal of Epidemiology & Community Health, *60*(7), 564-570. • Braveman, P. A., Kumanyika, S., Fielding, J., LaVeist, T., Borrell, L. N., Manderscheid, R., & Troutman, A. (2011). Health Disparities and Health Equity: The Issue Is Justice. *American Journal of Public Health*, *101*(S1), S149–S155. • Gravlee, C. C. (2009). How race becomes biology: Embodiment of social inequality. *American Journal of Physical Anthropology*, *139*(1), 47–57.	Class participation Online discussion

3	2/23/16	Guest Speaker: Elena Vesselinov and Mary Clare Lennon Applying a measure of neighborhood income mix to better understand child well-being.	• Vesselinov, E., Lennon, M.C. Draft: Is it all in the eye of the beholder? Mixed-income neighborhoods' advantage in the context of mortgage foreclosures", under review in *Journal of Urban Affairs* (3 reviews included as Vesselinov et al) • Lennon, M.C. & Vesselinov, E. (2015) "Do children benefit of living in mixed-income neighborhoods compared to other types of neighborhoods? Letter of intent to the William T Grant Foundation re • Krieger, N., Waterman, P. D., Spasojevic, J., Li, W., Maduro, G., & Van Wye, G. (2015). Public Health Monitoring of Privilege and Deprivation With the Index of Concentration at the Extremes. *American Journal of Public Health*, e1–e8. • Gatrell, A. C., Popay, J., & Thomas, C. (2004). Mapping the determinants of health inequalities in social space: can Bourdieu help us? Health & Place, 10(3), 245–57. • Reardon SF,& Bischoff, K. 2011. More unequal and more separate: growth in the residential segregation of families by income, 1970-2009. New York: Russell Sage Foundation. http://www.scribd.com/doc/72915429/Growth-in-the-Residential-Segregation-of-Families-by-Income-1970-2009	Class participation Online discussion
4	3/1/16	Guest Speaker: Diana Romero Measuring health-related phenomena: The Different Contributions of Qualitative and Quantitative Approaches	• Romero, D., Kwan, A., Swearington, J. Nestler, S., Cohen, N. (2012). Impact of the Closure of a Large Urban Medical Center: A Qualitative Assessment (Part I) *J Community Health, 37*:982–994. • Romero,D., Kwan, A., Nestler, S. & Cohen, N. (2012). Impact of the Closure of a Large Urban Medical Center: A Quantitative Assessment (Part II) *J Community Health, 37*: 995–1005 • Small, M. L. (2011). How to Conduct a Mixed Methods Study: Recent Trends in a Rapidly Growing Literature. Annual Review of Sociology, 37(1), 57–86.	Class participation Online discussion
Part II: Measuring the Spatial, Social, and Temporal Dimensions of Health Stressors				
5	3/8/16	Guest Speakers: Juliana Maantay and Andrew Moroko. What are the strengths and weaknesses of different approaches to measuring the relationship between the distribution of environmental stressors and	• Maantay, J.A. (2007). Asthma and air pollution in the Bronx: Methodological and data considerations in using GIS for environmental justice and health research. *Health and Place*, 13:32-56. Special issue: Linking population health, critical theory, and geographical information science. Maantay, J., & Maroko, A. (2015). "At-risk" places: inequities in the distribution of environmental stressors and prescription rates of mental health medications in Glasgow, Scotland. *Environmental Research Letters*, *10*(11) • Grady, S. (2011). Housing quality and racial disparities in low birth weight: A GIS assessment. Chapter 15 in Maantay, J.A. and McLafferty, S., eds. Geospatial Analysis of Environmental Health:.303-318. • Pathak, E.B., Reader, S., Tanner, J.-P., and Casper,	Class participation Online discussion

		health?	M.L. (2011). Spatial clustering of non- transported cardiac decedents: The results of a point pattern analysis and an inquiry into social environmental correlates. *International Journal of Health Geographics, 10*(46): 1-11. • Oliver, L., Schuurman, N., and Hall, A.W. (2007). Comparing circular and network buffers to examine the influence of land use on walking for leisure and errands. *International Journal of Health Geographics, 6*(41): 1-11. • Curtis, A. (2008). Three-dimensional visualization of cultural clusters in the 1878 yellow fever epidemic of New Orleans. *International Journal of Health Geographics, 7*:(47): 1-10.	
6	3/15/16	Guest Speaker: Yoko Nomura. Measuring the effects of psychosocial stress on health outcomes across the life course	• Nomura Y, Marks DJ, Grossman B, Yoon M, Loudon H, Stone J, Halperin JM. (2012). Exposure to gestational diabetes mellitus and low socioeconomic status: effects on neurocognitive development and risk of attention deficit/heperactivity disorder in offspring. *JAMA Pediatrics* (former *Arch Pediatr Adolesc Med*), *166*(4), 337-43. • Glover V. (2011). Annual Research Review: Prenatal stress and the origins of psychopathology: an evolutionary perspective. *Journal of Child Psychology and Psychiatry*, *52*(4), 356-367	Class participation Online discussion
7	3/22/16	Guest Speaker: Jeremy Porter Geographical Sociology and Public Health	• Butts, J. A., Roman, C. G., Bostwick, L., & Porter, J. R. (2015). Cure Violence: A Public Health Model to Reduce Gun Violence. Annual Review of Public Health, 36(1), 39–53. • Galster GC. The mechanism (s) of neighbourhood effects: Theory, evidence, and policy implications. In *Neighbourhood effects research: New perspectives* 2012 Jan 1 (pp. 23-56). Springer Netherlands. • Small ML, Feldman J. Ethnographic evidence, heterogeneity, and neighbourhood effects after moving to opportunity. In *Neighbourhood effects research: New perspectives* 2012 Jan 1 (pp. 57-77). Springer Netherlands.	Class participation Online discussion
8	3/29/16	Recap: Reconnecting planning and public health influencing the contextual factors that influence disease and health.	• Pastor, M., & Morello-Frosch, R. (2014). Integrating Public Health And Community Development To Tackle Neighborhood Distress And Promote Well-Being. *Health Affairs*, *33*(11), 1890–1896. • Corburn, J., Curl, S., Arredondo, G., & Malagon, J. (2015). Making Health Equity Planning Work: A Relational Approach in Richmond, California. Journal of Planning Education and Research.	Class participation Online discussion
Part III: Interdisciplinary Approaches to Designing Health Interventions				
9	4/5/16	Nevin Cohen - From Behaviors to Practices: Applying Social	• Blue, S., Shove, E., Carmona, C., & Kelly, M. P. (2014). Theories of practice and public health: understanding (un)healthy practices. *Critical Public Health*, (November), 1–15. • Delormier, T., Frohlich, K. L., & Potvin, L. (2009).	Class participation Online discussion

		Practice Theory to Health Interventions	Food and eating as social practice - Understanding eating patterns as social phenomena and implications for public health. *Sociology of Health and Illness*, *31*(2), 215–228. • Cohen, N., & Ilieva, R. T. (2015). Transitioning the food system: A strategic practice management approach for cities. *Environmental Innovation and Societal Transitions*, *17*, 1–19.	Draft of Final Paper due 4/8/15
10	4/12/16	Guest Speaker: Terry Huang Applying Design Thinking to Community Health Interventions	• Frerichs, L., Brittin, J., Sorensen, D., Trowbridge, M. J., Yaroch, A. L., Siahpush, M., Huang, T. T. K. (2015). Influence of School Architecture and Design on Healthy Eating: A Review of the Evidence. *American Journal of Public Health*, *105*(4), E46–E57. • Trowbridge, M. J., Huang, T. T. K., Botchwey, N. D., Fisher, T. R., Pyke, C., Rodgers, A. B., & Ballard-Barbash, R. (2013). Public health and the green building industry: Partnership opportunities for childhood obesity prevention. *American Journal of Preventive Medicine*, *44*(5), 489–495. • Brittin, J., Sorensen, D., Trowbridge, M., Lee, K. K., Breithecker, D., Frerichs, L., & Huang, T. (2015). Physical Activity Design Guidelines for School Architecture. *PLoS ONE*, *10*(7), 1–30.	Class participation Online discussion
11	4/19/16	Nick Freudenberg. CUNY-Based Participatory Research: the Healthy CUNY initiative	• Freudenberg, N., Manzo, L., Mongiello, L., Jones, H., Boeri, N., & Lamberson, P. (2013). Promoting the Health of Young Adults in Urban Public Universities: A Case Study From City University of New York. Journal of American College Health, 61(7), 422–430. • Freudenberg, N., Manzo, L., Jones, H., Kwan, A., Tsui, E., & Gagnon, M. (2011). The Psychological Well-Being of CUNY Students: Results from a Survey of CUNY Undergraduate Students. Freudenberg, N., Manzo, L., Jones, H., Kwan, A., Tsui, E., & Gagnon, M. (2011). Food Insecurity at CUNY: Results from a Survey of CUNY Undergraduate Students. Campaign for a Healthy CUNY.	Class participation Online discussion
	4/26/16	**No Class: Spring recess**		
12	5/3/16	Jerry Markowitz – Public health research and policy change: the case of lead exposure.	• Markowitz, G., & Rosner, D. (2000). "Cater to the children": The role of the lead industry in a public health tragedy, 1900-1955. American Journal of Public Health, 90(1), 36–46. • Rosner, D., & Markowitz, G. (2012). With the Best Intentions: Lead Research and the Challenge to Public Health. American Journal of Public Health, 102(11), e19–e33. • Rosner, & Markowitz. (2009). The Trials and Tribulations of Two Historians : Adjudicating ... Medical History, 53, 271–292.	Class participation Online discussion
13	5/10/16	Course recap: Incorporating		Final Paper due 5/13/16

		different frameworks, theories, methods and stakeholders in public health research and implementation		
14	5/17/16	Online peer review of final papers		
15	5/24/16	Exam Week		

CUNY SCHOOL OF PUBLIC HEALTH

Graduate Center – Rm. 6495

PUBH 806 – Qualitative Research Methods with Applications to Urban Health

3 credits

Spring 2015

Catalogue description	This course will introduce students to approaches in designing and conducting qualitative research in topics of relevance to public health. It is intended to provide doctoral students with a foundation in the various qualitative data collection and analysis methods, focusing on their application to public health practice and research. It will cover elements of qualitative research design, data collection, analysis, and writing for publication. This will be integrated with the main assignment in which students develop a proposal for a qualitative research project tailored to address a specific public health research question.
Course meets	Mondays, 6:30-8:30 pm, Rm. 6495
Instructor	Diana Romero, PhD, MA
Email	diana.romero@hunter.cuny.edu
Phone	212-396-7743
Office	Silberman Bldg, Hunter College, CUNY School of Public Health 2180 Third Ave @ 119th St, Rm. 542
Office hours	By appointment
Required books	- Ritchie J, Lewis J. *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage; 2003. **OR** - Ritchie J, Lewis J, Nicholls CM, Ormston R. *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage; 2014. - Morgan DL. *Focus Groups as Qualitative Research*. 2nd ed. Thousand Oaks, CA: Sage; 1997. - Auerbach C, Silverstein LB. *Qualitative Data: An Introduction to Coding and Analysis*. New York: New York University Press; 2003.
Recommended books	Corbin JM, Strauss AL. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. 3rd ed. Los Angeles: Sage; 2008. Miles MB, Huberman AM, Saldada J. *Qualitative Data Analysis: A Methods Sourcebook*. 3rd ed. Thousand Oaks, CA: Sage; 2013.
Reserve material	Texts available in the Library's Reserve Reading Room or online

Other required materials	Readings from the literature, noted on the syllabus (below), on Blackboard (Bb) and/or on reserve

Course Structure

Throughout this course, teaching and learning will take place through interactive lecturing utilizing seminar-like discussion of course material, presentations from guest faculty/researchers, and class exercises. To effectively learn and master the course material requires a class-by-class sequential approach that builds on skills and concepts. Therefore, students are expected to be prepared for each class by carefully reading the texts and doing the assignments. Students should be "active learners" ready to pose questions to the faculty and their classmates, as well as respond to questions asked of them. Attendance at all classes is required; therefore, students should notify the instructor if they anticipate any absences.

The goal of the course is to provide students with a context in which they can further hone their understanding of qualitative research methods and study designs, and key considerations to be taken into account when deciding on using a qualitative research approach to address a specific research question. Guest speakers will make presentations of their research, with a strong focus on methodology. This will provide an "applied" basis upon which students will begin identifying the use and contribution of qualitative methods to public health practice and research. Class projects on qualitative methods will be undertaken including an initial project proposal with a brief literature review to inform specification of the (1) central research focus, (2) significance of the public health problem to be addressed (i.e., rationale for the project), (3) why a qualitative research approach is the most appropriate for the project, and (4) what specific data collection approach will be utilized. Students will then carry out their projects (or analyze existing data) during the semester and the final paper will be a manuscript following the standard format for report of a research study.

Assessment

Students' understanding of the course material will be evaluated through a combination of in-class activities and participation, written assignments, and presentations described below.

Grading

Required (cannot do class research project without this)	CITI Certificate: The CITI is an online training program (www.citiprogram.org) that provides certification for human subjects research. Students must complete the Basic Module by the second class session and upload their certificate to the Bb folder. Please do not leave this until the "last minute" as the Basic Module requires approximately 3-4 hours to complete. (Note: it is divided into several sections that can be done at different times.)
5%	Reflexive Memo: A 1-2 page memo in which you reflect on how your social, economic, gender, educational and other positions/identities may influence, constrain, and shape your research question and how these understandings, assumptions, and points of reference may inform your work as you collect and analyze data for your research project.
10%	Quantitative-Qualitative Questions Exercise: Identification and critique of two close-ended questions
Hypothetical Grade	Central Research Focus and Methods Proposal (draft): A short (3-4 pp) proposal of the public health research topic you would like to investigate, the qualitative method you will use, and why it is best suited for this research project.
15%	Research Proposal: Revised proposal and with logistical details and timeline added.
10%	Data Collection Guide/Instrument.

15%	Index/code book, data display, *or* analytic memo: Submit only 1 of 3 of these "steps" in the qualitative analysis process. (Depends on where the student is in the process.)
10%	Final Presentation: In-class presentation of project (data collection, analysis, and results).
25%	Final Paper: A complete write-up of the research question, methods, and results of the final project.
10%	Class Attendance and Participation: This pertains to an expectation of perfect attendance and *active class participation*.
100%	

Assignments are to be submitted in class on the day that they are due, unless the instructor has set up a folder on Blackboard where the assignment can be submitted *before* the start of class. Final grades are based on the sum of assignment scores as described above. There will be no opportunity to do additional work for extra credit.

Graduate Center Grade Policy
A (plus or minus) - Excellent
B (plus or minus) - Good
C (plus or minus) - Fair (lowest passing mark)
F - Failure
W - Withdrew without academic penalty. This is a student-initiated grade, which may be requested from the 4th through the 10th week of the semester. Under no circumstances can a student withdraw and receive a "W" grade after the 10th week of the semester without the written permission of the course instructor and the Executive Officer, and the approval of the Vice President for Student Affairs. This grade carries tuition liability.

Course Policies

Attendance and class participation
Students are expected to attend *every* class session and complete the readings *prior to* each of the class sessions so as to be able to participate fully during the class. Students should also be prepared to be selected at random to lead class discussions on assigned readings and other course materials. The instructor should be notified in person or by email if an absence is unavoidable; excessive lateness may be considered equivalent to absence from class. It is the student's responsibility to obtain missed class notes and related information from a colleague. Assignments must be received by the due dates regardless of class attendance.

Late submission of assignments
Assignments are due on the date indicated in this syllabus. A *full grade* will be deducted for each week an assignment is late. In case of emergency, please contact the instructor. Incomplete final grades for this course will NOT be granted unless the request is justified by a legitimate and documented emergency.

Guidelines for Written Assignments
All papers should be typed, double-spaced, spell-checked and proofread. Please use 1-inch margins all around and 11- or 12-point font. For identification purposes, please include your name, title of the assignment, course, term, and date. Print copies should be submitted for all assignments unless otherwise instructed. Use only AMA style for citing references. You may consult this link at guidelines on how to cite using the AMA style: http://www.lib.jmu.edu/citation/amaguide.pdf.

Use of Blackboard (Bb)
All assignments and course documents will be posted on Blackboard. Bb announcements and/or email will used to communicate new information and/or changes. It is the student's responsibility to check Bb frequently for such announcements. In addition, students should be aware that emails sent by the instructor via Bb will be automatically sent to the email address in the Bb system.

Use of Qualitative Software

For individuals who choose to utilize qualitative software, they may take advantage of the free offering of both Atlas.ti (version 7.0) and QSR Nvivo (Version 10.0) for all Graduate Center students. By logging onto the GC Remote Student Portal on Citrix [https://remote.gc.cuny.edu/], you can access either aforementioned software by clicking on the 'Statistics' folder upon logging in. If you choose to use software, please use software with which you are comfortable; you will be responsible for your own interpretations and work. The instructor recommends using Dedoose (Dedoose.com) which comes with a free one-month trial period and then can be continued at approx. $10/month.

Course/syllabus changes
This syllabus is a *guide* for the course and is subject to change, particularly given the advanced-level of the course. Changes will be announced in class and/or will be posted on the course Blackboard site.

Class citizenship & rules of conduct
Cellphones and other electronic devices
Use of any electronic devices in class must be limited to accessing the course materials under discussion in that session and taking notes. Under no circumstances should these devices be used for communication with others *within or outside of the classroom*. Students are expected to be fully engaged with and participating in the class; thus, use of any devices that distract the student(s), instructor(s), and/or guest(s) will be considered intrusive and in violation of expected standards of conduct in the classroom. As such, the student may be asked to discontinue use of the device.

Email correspondence
The instructor will try to respond to emails within a 24-hour period during the standard Monday through Friday work week. Students should not wait until a Friday to send an email if a response is needed before the following Monday. The instructor may respond over the weekend but it is not guaranteed. Responses that take more than a day during the work week may be due to special circumstances, such as the instructor is attending an out-of-town conference, the student's query is of a complex nature that requires consultation with others/obtaining additional information, etc.

Institutional Policies
Accessibility
Among other responsibilities, the CUNY Graduate Center Vice President for Student Affairs has overall responsibility for Student Disability Services and is the 504/ADA Coordinator.

Contact information:
Matthew G. Schoengood, Vice President for Student Affairs, Rm: 7301, Telephone: 212-817-7400
Email: studentaffairs@gc.cuny.edu

Academic integrity

The Graduate Center outlines a clear definition of Academic Honesty and the DPH program expects students to know and follow the CUNY Academic Integrity Policy. Both can be found in the GC Student Handbook as well as a link to the GC Avoiding and Detecting Plagiarism guide.
http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf

Help with research and writing
Librarians at the CUNY GC Mina Rees Library are available to help students with using research databases and citation software in person or remotely by phone, chat or email. Contact information can be found on the library's research website at: http://library.gc.cuny.edu/research-help/

The GC Wellness Center provides academic consultation services to help keep students on track with their academic work by working on the obstacles to progress and developing strategies to overcome them. More information can be found on the GC Wellness Center's website at:
http://www.gc.cuny.edu/Prospective-Current-Students/Student-Life/Health-Wellness/Counseling-Services/Academic-Health

Last day to drop the course with the grade of "W": April 16, 2015
http://www.gc.cuny.edu/Public-Programming/Calendar/Academic-Calendar-2014-15?page=2

Grade of Incomplete (INC) and Graduate Center Policies
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergency. Only students averaging a C or above in the course are eligible to request an incomplete course grade. According to Graduate Center policy updated 7/11/2011, to resolve incomplete grades, students must fulfill their obligations within one calendar year after the INC grade is assigned. After one year, an incomplete grade (''INC'') will become a permanent incomplete. Extensions will be granted only in exceptional circumstances upon written application and with the permission of the faculty member, the Executive Officer, and the Vice President for Student Affairs. Permanent incompletes will accrue no credit. Students with more than two incomplete courses will be brought to the attention of their Executive Officer to determine whether or not they are making satisfactory progress. Students will not normally be regarded as making satisfactory progress toward their degrees if they have more than two "INC"s on their records. Students should be aware that continued registration and most financial aid awards are conditional upon satisfactory progress. Students should also note that credits for which they have an "INC" as of the end of the third week of classes of a given semester are not counted toward advancement to the next level for that semester.

Grade appeals
The doctoral faculty as a whole and, more specifically, the faculty of a doctoral program are responsible for determining the requirements and standards of performance for courses and for qualifying examinations. A course instructor retains considerable discretion in these matters. The instructor is under obligation, however, to ensure that the course syllabus is consonant with the goals of the curriculum of the degree program. The expected level of performance in a given course shall reflect levels of difficulty relevant to the educational objective of the program. In addition, the instructor has an obligation to students to make clear the basis of evaluation (e.g., reading assignments, papers, contributions to seminar discussions, experimental work) at the start of each course so that students are not surprised by unexpected or untimely demands. Grades on examinations or for work in a course are the responsibility of the instructor. Specific information pertaining to the procedures for an official grade appeal through the GC can be found in the GC student handbook at:

http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf

Class Schedule

Class	Date	Topic	Readings and Assignments
1	2/2/15	Course overview and introduction: Qualitative research and its methodological tools	Ritchie & Lewis, Ch 1: Foundations of Qualitative Research Auerbach & Silverstein, Ch 1: Introducing Qualitative Hypothesis-Generating Research Peshkin, Alan. The goodness of qualitative research. *Educational Researcher.* 1993;22:23-29. Recommended: Ragin CC, Nagel J, White P. *Workshop on Scientific Foundations of Qualitative Research (7/11-12/03*). Washington, DC, National Science Foundation, 2004. http://www.nsf.gov/pubs/2004/nsf04219/nsf04219.pdf **DUE**: In a few sentences, post to Bb a research idea/question that you have that can be explored via a qualitative research method.
2	2/9/15	Qualitative Study Design I: Research Questions	Ritchie & Lewis, Ch 2: The Applications of Qualitative Research Auerbach & Silverstein, Ch 2: Designing Hypothesis-Generating Research Auerbach & Silverstein, Ch 3: Qual and Quant Research as Complementary Strategies Recommended: Corbin & Strauss, Ch 2: Practical Considerations **DUE:** Reflexive Memo and CITI certification
3	2/18/15 (Wed – follows Mon schedule)	Qualitative Study Design II: Sampling Strategies **- Class held online (asynchronous using Bb)** **- Get going with Morgan book (FGs)**	Ritchie & Lewis, Ch 3: Design Issues Ritchie & Lewis, Ch 4: Designing and Selecting Samples Recommended: Small ML. 'How many cases do I need?' On science and the logic of case selection in field-based research. *Ethnography*. 2009; 10(1): 5-38. **DUE**: Quantitative-Qualitative Questions Exercise (student pairs)
4	2/23/15	Introduction to Data Collection Methods and	Ritchie & Lewis, Ch 5: Designing Fieldwork Strategies and Materials (IDIs and FGs)

		Asking Open-Ended Questions	<u>Recommended:</u> Ulin, Robinson & Tolley, Ch 4: Collecting Qualitative Data **DUE**: Central research focus and methods proposal draft
5	3/2/15	Data Collection I: Focus Groups	Morgan DL. *Focus Groups as Qualitative Research*. 2nd ed. Thousand Oaks, CA: Sage; 1997. [the *complete* handbook] Romero D, Kwan A, Swearingen J, Nestler S, Cohen N. Impact of the closure of a large urban medical center: A qualitative assessment. *Journal of Community Health*. 2012;37:982-994. <u>Recommended</u>: Ritchie & Lewis, Ch 7: Focus Groups Morgan DL. Reconsidering the role of interaction in analyzing and reportinging focus groups. *Qual Health Res.* 2010;20:718-722. Shelley D, Cantrell MJ, Moon-Howard J, Ramjohn DQ, Vandevanter N. The $5 man: the underground economic response to a large cigarette tax increase in New York City. *Am J Public Health*. 2007;97(8):1483-8. Goudet SM, Faiz S, Bogin BA, Griffiths PL. Pregnant women's and community health workers' perceptions of root causes of malnutrition among infants and young children in the slums of Dhaka, Bangladesh. *Am J Public Health*. 2011;101(7):1225-33. Paz MG, Fry D. Bringing the Global to the Local: Using Participatory Research to Address Sexual Violence with Immigrant Comunities in NYC. 2008. *(participatory research, focus groups with pictoral/image instruments)* *Qualitative Health Research* special issue on focus groups methods: May 2010; 20(5).
6	3/9/15	Data Collection II: In-Depth Interviews	Ritchie & Lewis, Ch 6: In-depth Interviews Edin K, Kefalas M. *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*. Berkeley, CA: University of California Press; 2005. (Ch 1: Introduction, p. 1-26; App. A: City, neighborhood, family characteristics, and research methods, p. 225-247; App. B: Interview Guide) [In class: Field Logistics—SPAFF project: training materials, sampling, etc]

			Recommended: Merry L, Clausen C, Gagnon AJ, et al. Improving qualitative interviews with newly arrived migrant women. *Qual Health Res*. 2011;21:976-86. Grineski S. Childhood asthma, public housing, and environmental control: Differences between families renting with section 8 vouchers and those living in the projects. *J Pov*. 2008;12:432-55. Ghose T, Swendeman DT, George SM. The role of brothels in reducing HIV risk in Sonagachi, India. *Qual Health Res*. 2011;21:587-600. Grossman D, Holt K, Peña M, et al. Self-induction of abortion among women in the United States. *Reprod Health Matters*. 2010;18(36):136-46. **DUE:** *REVISED* Research question and methods proposal
7	3/16/15	Data Collection III: Participant/Field Observation, Ethnography	Ritchie et al (2014), Ch 9: Observation Shuler S, Sypher BD. Seeking emotional labor: When managing the heart enhances the work experience. *Management Communication Quarterly.* 2000;14:50-89. [Triangulated participant observation, interviews, and 911 call data]. Hirsch JS, Higgins J, Bentley ME, Nathanson CA. The social constructions of sexuality: marital infidelity and sexually transmitted disease-HIV risk in a Mexican migrant community. *Am J Public Health*. 2002;92(8):1227-37. Recommended: Lopez I. *Matter of Choice: Puerto Rican Women's Struggle for Reproductive Freedom*. New Brunswick, NJ: Rutgers University Press; 2008. [sterilization] Fadiman A. *The Spirit Catches You and You Fall Down: A Hmong Child, Her American Doctors, and the Collision of Two Cultures*. New York: Farrar, Straus, and Giroux; 1998. Rapp R. *Testing Women, Testing the Fetus: The Social Impact of Amniocentesis in America*. New York: Routledge; 1999. Ch. 1: How Methodology Bleeds into Daily Life, pp. 1-22. **DUE**: Data collection guide/instrument
8	3/23/15	Data Collection IV: Document Review, Content Analysis	Borzekowski DL, Schenk S, Wilson JL, Peebles R. e-Ana and e-Mia: A content analysis of pro-eating disorder Web sites. *Am J Public Health*. 2010;100:1526-34.

			Ray JL, Smith AD. Using photographs to research organizations: Evidence, considerations, and application in a field study. *Organizational Research Methods.* 2012;15:288-315. [visual methods] Latimer AE, Green KE, Schmid K, et al. The identification of framed messages in the New York State Smokers' Quitline materials. *Health Educ Res*. 2010;25(1):54-60. Hussain H, Omer SB, Manganello JA, et al. Immunization safety in US print media, 1995-2005. *Pediatrics*. 2011;127 Suppl 1:S100-6. <u>Recommended</u>: Offen N, Smith EA, Malone RE. "Willful misconduct": how the US government prevented tobacco-disabled veterans from obtaining disability pensions. *Am J Public Health*. 2010;100:1166-73. Almeida-Filho N, Kawachi I, Filho AP, Dachs JN. Research on Health Inequalities in Latin America and the Caribbean: Bibliometric Analysis (1971-2000) and Descriptive Content Analysis (1971-1995). *Am J Public Health*. 2003;93:2037-2043. Gilmore A, Collin J, Townsend J. Transnational tobacco company influence on tax policy during privatization of a state monopoly: British American Tobacco and Uzbekistan*. Am J Public Health*. 2007;97(11):2001-9.
9	3/30/15	Qualitative Data Analysis I: Approaches & Techniques	Auerbach & Silverstein, Ch 4: Coding 1—The Basic Ideas Corbin & Strauss, Ch 6: Memos & Diagrams
No Class	4/6/15	SPRING RECESS	Work on individual/group research projects
10	4/13/15	Qualitative Data Analysis II: From Data Reduction & Analysis to Results	Auerbach & Silverstein, Ch 5: Coding 2—The Mechanics *(Phase 1: Making the Text Manageable)* Auerbach & Silverstein, Ch 6: Coding 2—The Mechanics *(Phase 2: Hearing What Was Said)* Auerbach & Silverstein, Ch 7: Coding 2—The Mechanics *(Phase 3: Developing Theory)* <u>Recommended</u>: Miles, Huberman, Saldana Ch 11: Making Good Sense: Drawing and Verifying Conclusions, p. 275-322 **DUE**: Index/code book (***or*** 1 of 2 other options due next week)

11	4/20/15	Qualitative Data Analysis III: Writing	Ritchie & Lewis, Ch 11: Reporting & Presenting Qualitative Data Miller DL, Creswell JW, Olander LS. Writing and retelling multiple ethnographic tales of a soup kitchen for the homeless. *Qualitative Inquiry.* 1998;4:469-491. [Ethnography; Writing <-> Interpretation; different yet non-contradictory findings] <u>Recommended</u>: Ulin, Robinson & Tolley, Ch 7: Putting It Into Words: Reporting Qualitative Research Results Corbin & Strauss, Ch 13: Writing thesis, monographs, & giving talks, p. 275-295. Wolcott HF. *Writing Up Qualitative Research*. 3rd ed. Los Angeles: Sage; 2009. **DUE**: Data display or analytic memo (***if*** did not submit index/codebook last week)
12	4/27/15	Generalization and Validity (a.k.a. Credibility, Truthfulness)	Auerbach & Silverstein, Ch 8: Convincing Other People: The Issues Formerly Known as Reliability, Validity and Generalizability Ritchie & Lewis, Ch 10: Generalising from Qualitative Research Maxwell JA. Understanding and validity in qualitative research (Ch. 2). In Huberman AM, Miles MB, eds. *The Qualitative Researcher's Companion*. Thousand Oaks, CA: Sage; 2002.
13	5/4/15	Dissemination of Findings, Research Ethics, and Other Reflections on Qualitative Research	Ulin, Robinson & Tolley, Ch 8: Disseminating Qualitative Research Ritchie et al (2014), Ch 4: Ethics Baum F. Researching public health: behind the qualitative-quantitative methodological debate. *Soc Sci Med*. 1995;40:459-68. Newman KS. Qualitative research on the frontlines of controversy. *Soc Meth Res*. 2002; 31:123-130. <u>Recommended</u>: Babbie E. Laud Humphreys and research ethics. *International Journal of Sociology and Social Policy*. 2004; 24: 12-19. Nardi PM. "The Breastplate of Righteousness": Twenty-five years after Laud Humphreys' tearoom trade: Impersonal sex in public places. *J Homosexuality*. 1995;30:1-9.

			Glesne C. But is it ethical? Learning to do it right. (Ch. 6). *Becoming Qualitative Researchers: An Introduction*. 3rd ed. Boston: Pearson, 2006.
14	5/11/15	Student Research Projects	**DUE:** Student Presentations (10 min)
15	5/18/15	Student Research Projects	**DUE:** Student Presentations (10 min) **FINAL PAPER DUE MAY 22, 2015**

PUBH 806 – Spring 2015: Assignment Schedule

Session	Due Date	Assignment
Session 1	2/2/15	- Assigned readings - Post research idea on Bb
Session 2	2/9/15	- Assigned readings - Reflexive Memo and CITI completion certificate
Session 3	2/18/15 (Online - Bb) (Morgan handbook)	- Assigned readings - Quantitative questions exercise (student pairs)
Session 4	2/23/15	- Assigned readings - Central Research Focus and Methods Proposal (draft)
Session 5	3/2/15	- Assigned readings
Session 6	3/9/15	- Assigned readings - Central Research Focus and Methods Proposal (revised)
Session 7	3/16/15	- Assigned readings - Data Collection Guide/Instrument
Session 8	3/23/15	- Assigned readings
Session 9	3/30/15	- Assigned readings
SPRING RECESS	4/6/15	- Work on individual/group research projects
Session 10	4/13/15 (Choose **either** this assignment **or** 1 of the 2 for next week)	- Assigned readings - Index/Code Book (code families and sub-code definitions developed *up to this point)*
Session 11	4/20/15	- Assigned readings - Data Display *or* Analytic Memo (types of data analysis processes, for where ever you are *at this point*)
Session 12	4/27/15	- Assigned readings
Session 13	5/4/15	- Assigned readings
Session 14	5/11/15	Final Project Presentations (10 min)
Session 15	5/18/15	Final Project Presentations (10 min) **FINAL PAPER DUE 5/22/2015**

Degree Program Competencies	Course Learning Objectives	Most relevant sessions and assignments (objectives may also be touched upon in other sessions)
This course will help you to achieve the following core competencies, which are expected of all DPH graduates	**After successfully completing this course, you are expected to be able to:**	
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues	• Describe the strengths and limitations of 4 different approaches to qualitative research (focus groups, in-depth interviews, observational methods, content/document analysis) • Identify the various limitations associated with close-ended data collection items (questions) and revise such items to open-ended formats	1-8; Quantitative-Qualitative Questions Exercise; Reflexivity Memo; Research Proposal
Design and conduct etiological, intervention, policy, implementation science and other empirical studies that contribute to new knowledge about population health	• Design a study on a public health topic of interest that uses one of the qualitative methods described above • Implement a pilot version of the study using an qualitative sampling approach and data collection method appropriate to the central research focus	2-8; Quantitative-Qualitative Questions Exercise; Research Proposal; Codebook; Data Display/Analytic Memo
Implement professional and organizational ethical guidelines in population health research and practice.	• Evaluate a qualitative study design to determine its compliance with established standards for the conduct of research with human subjects	13; CITI certification; Research Proposal; Final Presentation (14-15); Final Paper
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	• Analyze qualitative (text-based data) using inductive (ground theory) methodology to make data-supported claims • Synthesize research findings in the form of a final written report and oral presentation	9-13; Final Presentation (14-15); Final Paper

CUNY SCHOOL OF PUBLIC HEALTH

COURSE SYLLABUS

The Graduate Center
PUBH 80700 Practicum Project
3 Credits
Spring 2016

Time and location	This course will not meet.
Instructor	Daliah Heller, PhD MPH daliah.heller@sph.cuny.edu
Office hours	By appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	The DPH Practicum Project is a planned, supervised and evaluated experience that allows students to apply the knowledge and skills that they have acquired through learning experiences in a practice setting. The DPH Practicum Project requires 180 practicum hours that can be completed in a range of organizations across New York City or elsewhere. Students must document how the 180 practicum hours are spent. The student must complete a detailed learning plan, a summary report (that includes objectives), a self-evaluation, and a final report.
Course prerequisites	PUBH 800, PUBH 801
Course format	The pedagogical component of this course will be administered online, including all assignments. The student will meet individually with the Course Instructor at least twice during the semester (Practicum Project period).
Required reading and resources	N.a.
Suggested reading and resources	N.a.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
Identify, develop, evaluate and recommend policy and programmatic interventions to improve population health at individual, community, government and country levels based on empirical evidence of social, political, cultural, biological, economic, historical, behavioral, environmental, and global factors in health and disease.	Apply public health knowledge and skills to design, implement monitor, and assess health-related interventions.	• Learning Plan • Progress Report • Final Report
Assess the mechanisms and pathways by which factors influence individual and population health.		
Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues.	Demonstrate the application of cross-disciplinary methods, theories, and data in public health practice.	• Final Report
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	Present and discuss public health research and practice in diverse settings and audiences.	• Final Report • Project-related products • Self-reflection paper
Demonstrate leadership skills to facilitate the goals of population health research and practice.		
Design and deliver innovative educational experiences that promote learning about population health in academic and practice-based settings	Apply public health research and practice innovation to a wide array of settings and situations	• Learning Plan
Implement professional and organizational ethical guidelines in population health research and practice.	Thoroughly articulate and address ethical issues in public health research and practice.	• Self-reflection paper

Secure resources to conduct population health research and practice	Identify sources of funding and material support for public health research and practice.	• Self-reflection paper

Course Assessments

Over the course of the semester, the student is required to submit four assessments: a detailed Learning Plan, a Progress Report, a Final Report, and a Self-Evaluation paper. Though not graded, the Project Preceptor must also complete and submit a Student Evaluation Report at the end of the Project.

Grading

Evaluation criteria

Student progress in the Practicum will be measured with the documents submitted over the course of the semester. A rubric is posted with each Assignment on the Blackboard course website, detailing the measures by which it will be assessed.

The relative weight of each course component is as follows:

Assessment	Weight
Learning Plan	15%
Progress Report	10%
Final Report	60%
Preceptor Evaluation	Not graded
Self-Evaluation	15%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

The final course grade will be determined using the performance assessment described above, and resulting in a Pass (70% or higher) or a Fail (less than 70%) grade.

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course.

Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

While the program discourages students from taking Incompletes, under some circumstances, an Incomplete may be the only option for completing the Practicum Project. **A request for an Incomplete must be approved by the Course Instructor, and the incomplete grade must be resolved by the end of the subsequent semester.**

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

No class will be given for this course. Students must submit Assignments to the course Blackboard site by the deadline posted. Students will be required to meet with the Course Instructor at least twice during the semester.

Late/incomplete submission of assignments

Late assignments will not be accepted unless approved by the Course Instructor, and with sufficient documentation describing the reason for lateness.

Make-ups, rewrites, and extra credit

No make-ups, rewrites, or assignments for extra credit will be offered.

Expectations of students

Students are expected to submit Assignments on time, to participate respectfully on the course Blackboard website, and to communicate with the Course Instructor on progress and problems related to the Practicum Project, as soon as issues arise.

Expectations for the instructor

The Course Instructor will grade Assignments and post results within five days of submission. The Course Instructor will respond to all emails from students within 48 hours of receipt, and will arrange face-to-face meetings with students as requested, and with Preceptors, as necessary.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

This course schedule is subject to change.

For important dates in the semester process, please refer to the current academic calendar.

Session	Date	Topic	Assignment
1	February 1	Introduction and review of Practicum Project expectations	ONLINE PARTICIPATION: Students must log on to the Blackboard course, and on the Discussion topic provided, create a new thread introducing themselves and providing a 2-3 sentence description of their Practicum Project. Students must comment on at least one other student's posting. **DUE: By February 8**
2	February 1 thru February 12	Individual meeting with Course Instructor	IN-PERSON MEETING: Schedule and meet with Course Instructor to review Practicum Project work-plan and discuss detailed Learning Plan.
3	February 15	Learning Plan assignment	ASSIGNMENT SUBMISSION: **DUE: By February 14** Prepare a detailed Learning Plan for your Practicum Project, and submit to Blackboard
4	March 7	Progress Report assignment	ASSIGNMENT SUBMISSION: **DUE: By March 13** Prepare a progress report on your Practicum Project work to date, and submit to Blackboard and to your Practicum Sponsor.
5	May 2 thru May 13	Individual meeting with Course Instructor	IN-PERSON MEETING: Schedule and meet with Course Instructor to review Practicum Project progress and discuss plans for Final Report.

6	May 16	Final Report assignment	ASSIGNMENT SUBMISSION: **DUE: By May 16** Submit a comprehensive final report on your Practicum Project, demonstrating how the Project objectives were achieved. Submit via Blackboard, and include any attachments produced for the Project.
7	May 16	Practicum Sponsor evaluation of student	EVALUATION SUBMISSION (not graded): **DUE: By May 19** Practicum Sponsor must email a completed, co-signed evaluation form to Course Instructor. *Student should also upload the completed evaluation form to the Final Report submission on Blackboard.
8	May 16	Self-reflection	ASSIGNMENT SUBMISSION: **DUE: By May 20** Via Blackboard, submit a final self-evaluation of your work on the Practicum Project.

DPH CSH SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

PUBH 810: Community Health Interventions: Theory and Methods
Spring 2016

Catalogue description	This course prepares students to lead research/intervention teams that plan, implement and evaluate community health interventions in community settings.
Course meets	Online (asynchronous) plus 4 in-person seminars at 55 W. 125th Street
Instructor	Professor Terry Huang, PhD, MPH, CPH
Email	terry.huang@sph.cuny.edu [email is the best way to reach me]
Phone	646-664-8358
Office	55 W. 125th Street, Room 803, New York, NY 10027
Office hours	By email appointment
Pre-Requisite	PUBH 811
Required books	Brownson RC, Colditz GA, Proctor EK. Dissemination and Implementation Research in Health: Translating Science to Practice. New York, NY: Oxford University Press, 2012. **[hereafter referred to as DIRH]** http://www.amazon.com/Dissemination-Implementation-Research-Health-Translating/dp/0199751870/ref=sr_1_1?ie=UTF8&qid=1419372460&sr=8-1&keywords=dissemination+implementation+research+health Brownson RC, Baker EA, Leet TL, Gillepsie KN, True WR. Evidence-Based Public Health (2nd ed). New York, NY: Oxford University Press, 2011. **[hereafter referred to as EBPH]** http://www.amazon.com/Evidence-Based-Public-Health-Ross-Brownson/dp/0195397894/ref=sr_1_fkmr0_2?ie=UTF8&qid=1419372762&sr=8-2-fkmr0&keywords=Evidence-Based+Public+Health++%282nd++ed%29.+New+York%2C+NY%3A+Oxford+University+Press%2C+2011.
Recommended books	Institute of Medicine. Bridging the Evidence Gap in Obesity Prevention: A Framework to Inform Decision Making. Washington DC: The National Academies Press, 2010 http://www.iom.edu/Reports/2010/Bridging-the-Evidence-Gap-in-Obesity-Prevention-A-Framework-to-Inform-Decision-Making.aspx
Reserve material	N/A
Other required materials	N/A

Course Assessment
Your understanding of the course material will be evaluated through online discussion boards, hands-on survey development and fieldwork, active participation in in-person seminars, and a group intervention implementation design proposal.

Discussion Boards (20%; 5% for each discussion board)
The instructor will initiate the first discussion board. Subsequently, each student in the class will be responsible for initiating/leading one discussion in the typical graduate seminar style except that the discussion will be conducted on Blackboard. Each discussion will include the student's synthesis/reflection on the readings assigned that week. In addition, the student is expected to introduce a new article to the class pertaining to the topics of the month (approximately one discussion board per month). Depending on the size of the class, more than one student may be tasked to initiate/lead a discussion for each discussion board. Students leading the discussion should prepare the readings at least one week ahead of time so that all students are able to participate in the discussion the following week. New articles should be emailed to the instructor for posting on Blackboard before the beginning of a discussion board. Grading for each student will be based on the following:

- When leading a discussion, timely initiation of discussion and posting of article on 1 discussion board
- Quality of participation/comments on discussion boards

Development of Community Survey (10%)
Using an online Wiki or document sharing environment, students in the class will draw on readings and additional literature review to co-develop a short interview survey to be deployed in the field as part of the course project (see Proposal below). The class will reach consensus on the final survey to be used across communities. Grading will be based on:

- Active participation in the online exchange (5%)
- Original contributions to the class product (5%)

Proposal (60%)
Students will be randomly divided into small groups. Each small group will select certain communities as its focus (to be defined once the course commences). We will use the typical NIH grant proposal format. The proposal is divided into 5 parts:

- Significance of the Problem and Community Brief (2-3 pages single-spaced): nature of the implementation problem; assessment of barriers/enablers for the optimization of intervention strategies undertaken in the selected communities; public domain data should be used where appropriate (10%);
- Summary of Fieldwork (1-2 pages single-spaced): summary of field research findings informing the implementation design (field observations, interviews, surveys etc. to be drawn from course materials and literature); this typically goes into the "preliminary findings" section of grant proposal (20%);

- Intervention Implementation Plan (3-4 pages single-spaced): design of intervention strategies to enhance enablers and/or overcome barriers (15%);
- Evaluation Plan (2-3 pages single-spaced): strategies to measure the success or failure of proposed strategies (5%);
- Sustainability and dissemination plan (1-2 pages single spaced): strategies to increase the sustainability of what is proposed for implementation and strategies to scale up (i.e., expand, made more comprehensive, increase the reach or systematize) or diffuse (i.e., spread to other settings or populations) (15%).
- Final proposal overall improvement (5%)

A logic/theoretical model should accompany the intervention and evaluation plan. Additional tables and figures are welcome (maximum 4). Your final proposal should be 12 pages single-spaced (standard Arial font 12 and 1-inch margins on all sides). Feedback will be provided in writing and/or during seminar along the way to give each group the opportunity to refine the proposal and present the best product possible at the end of the semester.

In-Person Seminars (8%; 2% each)

New tools and special topics will be covered during seminars. We will also use part of the class time to trouble-shoot the various components of the course project. Attendance is mandatory. Grading will be based on:

- Attendance (1%)
- Active participation (1%)

Grading

		(Dates, if applicable)
2%	Personal Profile	2/7
20%	Discussion Boards 1-4	Varied (see below)
10%	Development of Community Survey	2/28
60%	Proposal	
	Significance/Community Brief (10%)	2/21
	Summary of Fieldwork (20%)	4/17
	Intervention Implementation Design (15%)	
	Evaluation Plan (5%)	4/17
	Sustainability/Dissemination Plan (5%)	5/15
	Final Proposal Overall Improvement (5%)	5/15
8%	In-Person Seminars (2% each)	Varied (see below)
100%		

The grading scale is as follows:

A+	97.5%-100%		**B-**	80.0 – 82.4%
A	92.5 – 97.4%		**C+**	77.5 – 79.9%
A-	90.0 – 92.4%		**C**	72.5 – 77.4%
B+	87.5 – 89.9%		**C-**	70.0 – 72.4%
B	82.5 – 87.4%		**F**	0.0 – 69.9%

Attendance and class participation

Each student is expected to participate fully in all online discussions, in-person seminars, and assignments. This course is designed to be online plus 4 in-person seminars. Dates for in-person seminars will be arranged once the course begins. Although the course is mostly asynchronously online, students are responsible for following weekly sessions via Blackboard. In each weekly folder, there are specific readings, assignments, information, and other tasks that need to be completed. Students must keep up with the Blackboard course from week to week. Students are expected to log into online discussion at least every other day to stay on top of any discussion or respond to comments. For group projects, all students must contribute equally.

Remember, it takes effort to succeed in an online course. Online courses are not merely didactic; rather, students are expected to discover and generate new knowledge through a variety of materials, assignments, projects and group interaction.

Lateness and absences

Not applicable to online components. In-person seminars are mandatory and graded.

Late submission of assignments

Late homework submission will not be graded. Exceptions can only be made in extreme situations such as illness or death in the family. Should this occur, students are expected to notify the instructors at the earliest moment possible. Failure to complete required weekly activities will result in no scores for those activities missed.

Class citizenship & rules of conduct

When communicating or completing your assignments online via Blackboard, pay attention to the following:

1. Check before you post. Always check whether a similar question that has been posted and answered on the discussion board to avoid duplicated messages and responses.
2. Use a descriptive subject line that reflects the content of your message. It makes the discussion/communication more efficient.
3. Write in short paragraphs or use bullets to break down your ideas into smaller chunks of information. This will make your postings easier to read. Avoid using more than 200 words per post.
4. Do not write in all uppercase. USING ALL CAPS MEANS YOU ARE SHOUTING although you may not mean it.
5. Avoid using sarcasm as it often is interpreted as rude and hurtful.
6. Do not edit or change message content when someone has already responded to you. If you have something to add or change, simply add a follow-up message.
7. People in this course may come from places around the world, so be respectful to diverse perspectives, cultures, and languages.
8. Be professional and engage with others respectfully.

Email correspondence

Email correspondence with instructors is preferred. Any problems you encounter during the course should be communicated to the instructors by email as soon as possible. We also welcome your email feedback on how we can improve your experience in the course. The instructors will generally respond to email within two business days.

Institutional policies (provide website link)

Accessibility

Among other responsibilities, the CUNY Graduate Center Vice President for Student Affairs has overall responsibility for Student Disability Services and is the 504/ADA Coordinator.
Vice President for Student Affairs - Matthew G. Schoengood
Room: GC 7301; telephone: 212-817-7400; e-mail: studentaffairs@gc.cuny.edu

Academic integrity

While you are encouraged to discuss ideas with each other to facilitate your learning experiences, the work that is turned in must be your own. For example, allowing someone to copy your work, passing or sharing your answers to others, and/or doing work for others (including computer assignments) are examples of violations of Academic Integrity. For more information please visit and read the University of California Davis website (http://sja.ucdavis.edu/academic-integrity.html) or visit the Center for Academic Integrity at Clemson University (http://www.academicintegrity.org) for a detailed description of academic integrity. One of the more common and destructive breaches of academic integrity is plagiarism. Visit the Plagiarism.org Learning Center (http://www.plagiarism.org) for more information on how to avoid plagiarism. The concerns and guidelines provided in these websites will be seriously applied in this course. Please see also the section on "Academic Honesty" in the GC Student Handbook (p.58).

Help with research and writing

Writing tutorials can be found at: http://jjc.jjay.cuny.edu/erc/writing/.

Last day to drop the course with the grade of "W"

The last day to drop the course is Feb. 19, 2016.

Grade of incomplete

See the section "Incomplete Grades" in the GC Student Handbook (p.52).

Grade appeals

See the section "Academic Disputes Concerning Grades" in the GC Student Handbook (p.64).

Schedule

Session	Date	Topic	Readings	Assignments
1	Feb 1 – Feb 7	Case Study: Community Parks Initiative Review of Models and Theories Introduction to Program Planning: Precede-Proceed	EBPH Ch. 9 Handout on Precede-Proceed Additional readings for those who have not taken an MPH-level community health intervention course or want a refresher	Personal Profile (brief bio + picture) (2/7)
2	Feb 8 – 14	Community Change Process Community Readiness Model	http://ctb.ku.edu/en/get-started http://ctb.ku.edu/en/best-change-processes http://triethniccenter.colostate.edu/communityReadiness_home.htm	Discussion Board 1 (Initiated by 2/8)
3	Feb 15 – 21	Assessing Community Barriers/Enablers for Intervention Implementation Public mobilization and integrating top-down and bottom-up approaches	EBPH Ch. 4, 5, 10 http://ctb.ku.edu/en/table-of-contents/assessment/assessing-community-needs-and-resources http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(14)61743-8.pdf	COMMUNITY BRIEF DUE (2/21)
4	Feb 22 – 28	Seminar #1		COMMUNITY INTERCEPT SURVEY FINALIZED & DEPLOYED (2/28)
5	Feb 29 – Mar 6	Implementation & Dissemination Research I	DIRH Ch. 1, 2, 3, 9	
6	Mar 7 – 13	Implementation & Dissemination Research II	DIRH Ch. 6, 7, 17, 20	Discussion Board 2 (Initiated by 3/7)
7	Mar 14 – 20	Designing	EBPH Ch. 8	

		Intervention Strategies to Improve Implementation	DIRH CH. 12, 14 Community Toolbox Ch. 20-26 http://ctb.ku.edu/en/table-of-contents	
8	Mar 21 – 27	Seminar #2		
9	Mar 28 – Apr 3	Evaluating Community Initiatives RE-AIMS Collective Impact Model	EBPH Ch. 10 DIRH Ch. 13, 15, 16 http://www.re-aim.hnfe.vt.edu/index.html Collective Impact Handout	Discussion Board 3 (Initiated by 3/28)
10	Apr 4 – 10	Group Work		
11	Apr 11 – 17	Seminar #3		FIELDWORK FINDINGS & INTERVENTION & EVALUATION PLANS DUE (4/17)
12	Apr 18 – 21	Effective Advocacy	Community Toolbox Ch. 30-35 http://ctb.ku.edu/en/table-of-contents	
--	Apr 22 – May 1	SPRING BREAK		
13	May 2 – 8	Sustaining Impact	DIRH Ch. 21, 22 Community Toolbox Ch. 45, 46 http://ctb.ku.edu/en/table-of-contents	Discussion Board 4 (Initiated by 5/2)
14	May 9 – 15	Scaling Up Interventions	http://www.who.int/healthsystems/topics/delivery/technical_brief_scale-up_june12.pdf http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001049 http://www.ijgo.org/article/S0020-7292(15)00139-3/pdf http://journals.lww.com/ja	FINAL PROPOSAL DUE (5/15)

			ids/Fulltext/2014/11011/The_Importance_of_Context_in_Implementation.10.aspx	
15	May 16 – 22	Seminar #4		

DPH Competencies	Course Learning Objectives	Assessment Methods
This course will help you achieve increased competency in community, society and health. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as follows:
4. Apply concepts, theories and methods from two or more disciplines to the study of urban health	• Articulate individual, social, environmental, and policy enablers and barriers to the implementation of community interventions. • Describe contemporary issues in implementation and dissemination research.	Discussion boards Proposal development
5. Design intervention or policy research studies that contribute to new knowledge about urban health	• Develop a community intervention with particular emphasis on implementation using a methodical approach.	Fieldwork Proposal development
6. Select methods and theories from diverse disciplinary perspectives to apply to the study of urban health and demonstrate a capacity to combine methods and disciplines in order to achieve fuller understanding of urban health issues	• Apply program planning models, community change frameworks, and evaluation frameworks from public health, social sciences, and management to the design of community interventions.	Survey development Proposal development
9. Demonstrate proficiency in each of the following areas and advanced skills in at least two of the following areas: (1) written communication with diverse constituencies, (2) collection and analysis of data on population health, (3) familiarity with health-related cultural beliefs and practices of at least two populations, (4) management of complex health projects, (5) teaching public health and (6) policy analysis and advocacy	• Synthesize original research from the literature that offers new insights into the design, implementation, evaluation, dissemination, and sustainability of community interventions. • Develop an intervention proposal modeled after a typical grant format that can be directly translated to a real-life community context. • Provide a plan on the management and operations of a community intervention in a real-life setting.	Discussion boards Proposal development Seminars

Specialization/ Track Competencies	**Course Learning Objectives**	**Assessments**
This course will help you to achieve the following track specific competencies, which are expected of Community, Society and Health track DPH graduates	After successfully completing this course, you are expected to be able to:	
1. Assess community needs, assets and capacity to promote health.	• Conduct needs assessment of a community to ascertain intervention implementation enablers and barriers. • Incorporate social determinants in the assessment of community needs.	Discussion boards Survey development Fieldwork Proposal development Seminars
2. Apply quantitative and qualitative or, when appropriate, mixed methods to community health research and evaluation.	• Propose how methods and theories from at least three disciplines (e.g., psychology, public health, management) complement each other to enhance the design of a community intervention. • Integrate diverse models, theories and frameworks in the evaluation design of an intervention. • Describe how the implementation, dissemination and sustainability of an intervention designed in the course can be optimized in a real-life context.	Proposal development Discussion boards Seminars
3. Investigate through multidisciplinary methods the potential implications and impact of policies and politics in health, education, justice, housing, welfare, child and family services and other sectors on individual and community health.	• Demonstrate how policy barriers can be overcome and how policy enablers can be enhanced for the implementation or dissemination of community interventions.	Proposal development Discussion boards
4. Develop and teach educational curricula on community health using theories and methods from the social sciences and public health disciplines.	• Incorporate a plan for how community residents would be engaged in the implementation of an intervention.	Proposal development

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PUBH 82000 Epidemiological Methods 1
3 Credits
Spring 2016

Time and location	Silberman, 322 (and C05), Wed 6:05-7:50
Instructor	Professor C Mary Schooling, PhD Email: mschooli@hunter.cuny.edu Phone: 212 396 7753
Office hours	Wednesdays 4:00pm – 6:00pm, by appointment or walk-in Silberman 545
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course will provide an in depth understanding of the design and conduct of epidemiological studies, including causal inferences, measurement, major study designs and threats to validity
Course prerequisites	
Course format	Lecture/Seminar
Required reading and resources	Aschengrau A & Seage GR. *Essentials of Epidemiology in Public Health*, 2nd edition, Jones and Bartlett publishers, 2008 And reading on blackboard, see schedule
Suggested reading and resources	Susser E, Schwartz S, Morabia A, & Bromet EJ. Psychiatric Epidemiology, 1st edition, Oxford University Press, 2006

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Identify key sources of data for epidemiologic purposes	1. Describe the design of major US surveys (NHANES) and explain how this affects analysis of the survey	Worksheet 1
2. Use measures of disease frequency and association to appropriately describe the distribution and determinants of disease, and appropriately characterize statistical uncertainty around such estimates	2. Distinguish between incidence and prevalence 3. Compare the role of causal factors and predictors in public health 4. Explain the scientific process and the role of refutation in epidemiology 5. Explain the relation between different measures of association 6. Compare the interpretation of absolute and relative risk 7. Test hypotheses regarding associations of health with environmental, demographic, social and economic factors	Worksheet 1 Worksheet 1 Worksheet 1 Worksheet 2 Worksheet 2 Midterm and Final
2. Select epidemiologic study designs, data collection techniques, and analytic approaches suitable for different scientific inquiries	1. Evaluate the relevance of the Bradford Hill criteria to the scientific method 2. Draw a directed acyclic graph for a research question using an RCT, a cohort study and a case-control study	Worksheet 3 Worksheet 4

	3. Compare the biases generated by selection bias and confounders 4. Describe the uses of instrumental variable analysis in public health 5. Explain the "Table 2" problem 6. Compare inferences that can be made from cohort study and RCT 7. Compare and contrast different types of case-control studies, and the measures they generate 8. Compare different methods for identifying confounders 9. Evaluate a study against the relevant checklist 10. Explain how to assess internal and external validity 11. Explain additive and multiplicative effect modification 12. Explain mediation 13. Evaluate a screening test 14. Calculate NPV, PPV and explain their determinants 15. Identify and communicate the limitations of specific research projects 16. Explain why most research findings are false 17. Design a study	Worksheet 4 Worksheet 4 Worksheet 5 Worksheet 5 Worksheet 7 Worksheet 8 Worksheet 9 Worksheet 11 Worksheet 12 Worksheet 13 Worksheet 14 Paper Study design Midterm and Final
3. Use statistical software to collect, retrieve, analyze and summarize epidemiologic data	1. Implement descriptive and analytic analyses in SAS 2. Select appropriate statistical methods for the data type and the research question	Computer assignments Midterm and Final

Course Assessments

The course will be assessed based on a two written assignments, 3 computer assignments, 12 worksheets, a midterm and a final.

Grading

Evaluation criteria

Written Assignments:

1) **Paper:** Students are asked to write a position paper discussing the levels of evidence needed for policy. Specifically: What level of evidence do you need for policy? Your paper should include a discussion about what we mean by a cause in epidemiology (definition), how we conceptualize causes and try to identify them in epidemiology, with specific reference to the thinking behind the RCT, cohort and case control study designs, and the limitations of epidemiology in identifying causes? The purpose of the position paper is to help students organize their thoughts on a topic of importance in epidemiology and develop an informed argument to support their ideas. The paper should begin with a clear statement of the student's position, or thesis, followed by a structured argument supporting that thesis, describing and discussing the limitations of the counter-arguments.
2) **Study Design:** Students are asked to design a study to assess the effect of a dietary element on cardiovascular events

The written assignments should be no more than 5 pages long, single spaced, 12-point font with 1 inch margins. Please ensure all statements of fact are referenced.

Grading rubrics for the written assignments

	(A+ to A-)	(B+ to B-)	(C+ to C)	(F)
Paper	Provides a comprehensive synthesis of the topic with appropriate examples and discussion of the implications for practice	Identifies the implications of the key points in the topic, provides some examples and relevance to practise	Describes the main concepts in the topic	Inability to identify and describe the main concepts
Study Design	Provides a comprehensive and detailed design for a feasible and cost-effective study	Provides a thorough design for a feasible study	Provides a design for a workable study	Inability to design a feasible study

Students are to complete 3 computer assignments, these are computer exercises.

Students are to complete 12 worksheets of mainly short answer questions about the topics covered in the lectures.

Midterm Exam: Students will have a take home midterm exam to complete in 1 week, consisting of short answer questions about topics covered during class lectures and in readings. Students must work independently and not discuss the exam with classmates.

Final Exam: The final exam will be a take-home computer assignment involving statistical analysis in SPSS of an analytic question, and students are expected to analyze the provided data, interpret findings in the context of the literature, and draw conclusions. The exam must be completed independently and students may not discuss the exam with classmates. Students will be given the questions 1 week before the exam is due.

The relative weight of each course component is as follows:

Assessment	Weight
Written Assignment	40
Computer Assignments	20
Worksheets	24
final	20
Midterm	16
	120

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty

generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation
Attendance is mandatory and class participation may generate extra credit.

Late/incomplete submission of assignments
Late or incomplete assignments will be accepted at the discretion of the instructor

Make-ups, rewrites, and extra credit
Make-ups and not available, but rewrites are allowed.

Expectations of students
- You must sign up for Blackboard so that you can receive course readings, updates and obtain lecture notes and other handouts. For instructions on registering for a portal account in order to access Blackboard, go to: https://portal.cuny.edu/portal/site/cuny/index.jsp?epi-content=LOGIN.
- Please forward your CUNY e-mail to your most frequently checked e-mail address. Check your e-mail regularly so that you can receive emergency communications and periodic updates about the class.
- You are expected to complete readings and written assignments prior to class.
- Any written assignments should be uploaded to blackboard by 4pm on the day of the class.
- Students are expected to participate in class discussions, treating their classmates and the instructor with respect.

Statistical analysis will be conducting using SAS. Students should be aware that they can bring their laptop computers to the CUNY School of Public Health library and get SAS software loaded for their home use. SAS has an excellent help menu and that there is a large amount of SAS code available online easily accessible through Google..

Expectations for the instructor
- Power Point lecture slides will be available for download on Blackboard after class.

- The instructor is available during office hours and by appointment to assist students with assignments, course material, and exam preparation. The preferred method of communication with the instructor is e-mail.
- Grades for each piece of work will be uploaded to blackboard within a week.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester.

- Please refer to the current academic calendar for important dates (for example: holidays, course drop, course withdrawal).

Course schedule

Session	Date	Topic	Reading	
1	3feb16	Introduction and review	None	
2	10feb16	Review measures of effect and data analysis	Assigned Readings: 1. Aschengrau text Ch. 2 & 3. 2. Northridge ME. Annotation: public health methods—Attributable risk as a link between causality and public health action. *American Journal of Public Health* 1995; 85:1202-1204. 3. Morabia A. The Essential Tension Between Absolute and Relative Causality *American Journal of Public Health* 2001; 91(3): 335-336 4. Davies HT, Crombie IK, Tavakoli M. When can odds ratios mislead? British Medical Journal 1998; 316: 989-991. Recommended readings: 1. Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA* 1998; 280: 1690-1691. 2. Schwartz LM, Woloshin S, Dvorin EL, Welch HG. Ratio measures in leading medical journals: structured review of accessibility of underlying absolute risks. BMJ 2006; 333(7581):1248.	Worksheet 1
3	17feb16	Causal inference in epidemiology 1	Assigned Readings: 1. Aschengrau text Ch.15. 2. Susser text pp. 33-52. 3. Benson K. Hartz AJ. A comparison of observational studies and randomized, controlled trials. *New England Journal of Medicine 2000*; 342(25):1878-1886. 4. Prasad V, Jorgenson J, Ioannidis JP, Cifu A.J Observational studies often make clinical practice recommendations: an empirical evaluation of authors' attitudes.J Clin Epidemiol. 2013 Apr;66(4):361-366. 5. M Parascandola, D L Weed. (2001) Causation in epidemiology. *J Epidemiol Community Health* 2001;55:905–912. 6. Hill AB. The environment and disease: Association or Causation? *Proceedings of the Royal Society of Medicine* 1965; 295-300. 7. Kreiger N. Epidemiology and the Web of Causation: Has anyone seen the spider? *Social Science and Medicine* 1994; 39:887-903. Recommended reading	Worksheet 2

			1. Taubes G. Epidemiology faces its limits. *Science* 1995; 269(5221):164-169 2. J Pearl. Introduction to Causal Inference. Int J Biostats 2010; 6: 1-11.	
4	24feb16	Directed acyclic graphs	Assigned Readings Greenland S, Pearl J, Robins, JM. Causal Diagrams for Epidemiologic Research. (1999) Epidemiology; 10(1): 37-48. Assigned Readings: 1. Iwashyna TJ, Kennedy EH, Instrumental variable analyses. Exploiting natural randomness to understand causal mechanisms. *Ann Am Thorac Soc*. 2013 Jun;10(3):255-60. 2. O'Keeffe AG, Geneletti S, Baio G, Sharples LD, Nazareth I, Petersen I.Regression discontinuity designs: an approach to the evaluation of treatment efficacy in primary care using observational data. *BMJ*. 2014 Sep 8;349:g5293. doi: 10.1136/bmj.g5293. 3. Keene D, Price C, Shun-Shin MJ, Francis DP, Effect on cardiovascular risk of high density lipoprotein targeted drug treatments niacin, fibrates, and CETP inhibitors: meta-analysis of randomised controlled trials including 117,411 patients. *BMJ*. 2014 Jul 18;349:g4379. doi: 10.1136/bmj.g4379. 4. Haase CL, Tybjærg-Hansen A, Qayyum AA, Schou J, Nordestgaard BG, Frikke-Schmidt R.,LCAT, HDL cholesterol and ischemic cardiovascular disease: a Mendelian randomization study of HDL cholesterol in 54,500 individuals. *J Clin Endocrinol Metab*. 2012 Feb;97(2):E248-56. 5. Simonsen L, Viboud C, Taylor RJ, Miller MA, Jackson L, Influenza vaccination and mortality benefits: new insights, new opportunities. *Vaccine*. 2009 Oct 23;27(45):6300-4. doi: 10.1016/j.vaccine.2009.07.008. 6. Westreich D, Greenland S. The table 2 fallacy: presenting and interpreting confounder and modifier coefficients. *Am J Epidemiol*. 2013 Feb 15;177(4):292-8.	Worksheet 3 Computer assignment 1
5	2mar16	Longitudinal studies 1	Assigned Readings: 1) Aschengrau text Ch. 6, 7 & 8 2) Susser text pp. 129-137. 3) Hernan MA. A definition of the causal effect for epidemiologic research. *J Epidemiol and Community Health* 2004; 58: 265-271. 4) Writing group for the Women's Health Initiative Investigators. Risk and benefits of estrogen plus progestin in healthy postmenopausal women. *JAMA* 2002; 288:321-333. 5) Pedersen AT, Ottesen B. Issues to debate on the Women's Health Initiative (WHI) study. Epidemiology or randomized clinical trials--time out for hormone replacement therapy studies? *Human Reproduction* 2003; 18(11):2241-2244.	Worksheet 4

			6) Petitti D, Commentary: hormone replacement therapy and coronary heart disease: four lessons. *Int J Epidemiol.* 2004 Jun;33(3):461-3.. 7) Smith GD, Lawlor DA, Harbord R, Timpson N, Day I, Ebrahim S. Clustered environments and randomized genes: a fundamental distinction between conventional and genetic epidemiology. *PLoS Med.* 2007 Dec;4(12):e352. 8) Vandenbroucke JP, von Elm E, Altman DG, Gøtzsche PC, Mulrow CD, Pocock SJ, Poole C, Schlesselman JJ, Egger M; STROBE Initiative. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. *Epidemiology*. 2007 Nov;18(6):805-35. 9) Berkman LF. Seeing the forest and the trees – from observation to experiments in social epidemiology. *Epidemiologic reviews* 2004; 26(2): 2-6. 10) Lipsitch M, Tchetgen E, Cohen T. Negative controls: a tool for detecting confounding and bias in observational studies. *Epidemiology* 2000: (3): 383-8. 11) Suissa S, Azoulay L. Metformin and the risk of cancer: time-related biases in observational studies. *Diabetes Care.* 2012 Dec;35(12):2665-73. 12) Patel CJ, Ioannidis JP. Placing epidemiological results in the context of multiplicity and typical correlations of exposures. *J Epidemiol Community Health*. 2014 Nov;68(11):1096-100.	
6	9mar16	Exercises	No reading	Worksheet 5
7	16mar16	Midterm		
8	30mar16	Case-control studies 1	Assigned Readings: 1) Aschengrau text Ch. 9. 2) Susser text pp. 212-225. 3) Morabia A. Case control studies in clinical research: Mechanisms and prevention of selection bias. *Preventive Medicine 1997*; 26:674-677. 4) Bloom MS, Schisterman EF, Hediger ML. Selecting controls is not selecting "normals": design and analysis issues for studying etiology of polycystic ovary syndrome. Fertility & Sterility 2006; 86: 1-12. 5) Susser ES, Schaefer CA, Brown AS, Begg MD, Wyatt RJ. The design of the prenatal determinants of schizophrenia study. *Schizophrenia Bulletin 2000*; 26:257-273. 6) Brown AS, Begg MD, Gravenstein S, Schaefer CA, Wyatt RJ, Bresnahan M, Babulas VP, Susser ES. Serologic evidence of prenatal influenza in the etiology of schizophrenia. *Archives of General Psychiatry 2004*; 61(8):774-780.	Computer Assignment 2
9	6apr2016	Case-control studies 2	Use the previous weeks	Worksheet 7

10	13apr2016	Ecological and meta-analysis	Assigned Readings: 1) Aschengrau text Ch. 6 2) Rose, G. Sick individuals and sick populations. Int J Epidemiology 2001; 30: 427-432. 3) Pearce N. The ecological fallacy strikes back. *J Epidemiol Community Health* 2000;54:326–327. 4) Schwartz, S. The fallacy of the ecological fallacy: the potential misuse of a concept and the consequences. American Journal of Public Health 1994; 84(5): 819-824. 5) Rosenthal R and DiMatteo MR. META-ANALYSIS: Recent Developments in Quantitative Methods for Literature Reviews. Annu. Rev. Psychol. 2001. 52:59–82. 6) http://prisma-statement.org/ 7) Stroup DF, Berlin JA, Morton SC, Olkin I, Williamson GD, Rennie D, Moher D, Becker BJ, Sipe TA, Thacker SB., Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group.*JAMA.* 2000 Apr 19;283(15):2008-12. 8) Gøtzsche PC, Ioannidis JP. Content area experts as authors: helpful or harmful for systematic reviews and meta-analyses? *BMJ*. 2012 Nov 1;345:e7031	Worksheet 8
11	20apr2016	Internal validity	Assigned Readings: 1) Aschengrau text Ch. 10, 11 & 12. 2) Susser text pp. 138-150. 3) Copeland KT, Checkoway H, McMichael AJ & Holbrook RH. Bias due to misclassification in the estimation of relative risk. *American Journal of Epidemiology* 1977, 105(5): 488-495. 4) Christenfeld JS, Sloan RP, Carroll D & Greenland S. Risk factors, confounding, and the illusion of statistical control. *Psychosometric Medicine* 2004, 66: 868-875. 5) Brenner H & Blettner M. Controlling for continuous confounders in epidemiologic research. *Epidemiology* 1997, 8(4): 429-434. 6) Pearce N, Checkoway H, Kriebel D Bias in occupational epidemiology studies. *Occup Environ Med*. 2007 Aug;64(8):562-8.. 7) Schwartz S, Campbell UB, Gatto NM, Gordon K. Toward a clarification of the taxonomy of "bias" in epidemiology textbooks. *Epidemiology*. 2015 Mar;26(2):216-22.	Worksheet 9 Computer assignment 3
12	4may2016	External validity /Effect modification	Assigned readings: 1) Aschengrau text Ch. 13 2) Susser text pp. 319-328. 3) Sun X, Ioannidis JP, Agoritsas T, Alba AC, Guyatt G. How to use a subgroup analysis: users' guide to the medical literature. JAMA. 2014 Jan 22-29;311(4):405-11.	Worksheet 11

			4) Ioannidis JP, Greenland S, Hlatky MA, Khoury MJ, Macleod MR, Moher D, Schulz KF, Tibshirani R. Increasing value and reducing waste in research design, conduct, and analysis. Lancet. 2014 Jan 11;383(9912):166-75.	
13	11may2016	Measurement & Mediation	Assigned Readings: 1) Aschengrau text Ch. 15. 2) Rothman KJ. (1995) Causes. American Journal of Epidemiology, 141(2): 90-95. 3) Hafeman DM, Schwartz S. (2009) Opening the Black Box: a motivation for the assessment of mediation. *International Journal of Epidemiology*, 38:838–845. 4) VanderWeele TJ, Mediation and mechanism. *Eur J Epidemiol*. 2009;24(5):217-24.	Worksheet 12
14	18may2016	Screening	Assigned Readings: 1) Saquib N, Saquib J, Ioannidis JP., Does screening for disease save lives in asymptomatic adults? Systematic review of meta-analyses and randomized trials. *Int J Epidemiol*. 2015 Jan 15. 2) Berry DA[1,] Failure of researchers, reviewers, editors, and the media to understand flaws in cancer screening studies: application to an article in Cancer. *Cancer.* 2014 Sep 15;120(18):2784-91.	Worksheet 13 Writing Assignments due
15	25may2016	Final		Final due Worksheet 14

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PUBH 822 Epidemiology Methods III
3.0 Credits
Spring 2016

Time and location	The Graduate Center (34th Street & 5th Avenue) room C01 Wednesdays 6:30-8:30pm
Instructor	Associate Professor, Elizabeth Kelvin, PhD, MPH Silberman building (2180 Third Avenue on 119th Street), Room 543 E-mail: ekelvin@hunter.cuny.edu Phone: 212-396-7751 Email is preferred method of communication
Office hours	Indicate days and times (adhere to College specific guidance on office hours)
Course website	Black Board: https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This seminar exposes students to emerging concepts and methods in epidemiologic research and provides students with an opportunity to consider how these strategies complement, and advance the more commonly used strategies in epidemiology.
Course prerequisites	PUBH821 or EPI751 with a grade of B or better or an equivalent course. Some SAS proficiency is assumed
Course format	This class is taught as a combination of lecture, student presentation/student-led group discussion, computer-based data analyses, and short analytic papers. In general, the first hour of class will be used for lecture and discussion of the readings, and the second hour will be used to work on either a computer-based exercise or a case study. The computer based exercises provide an opportunity to practice applying methodologies discussed, and case studies provide an opportunity to understand how the methods are used to address a real world challenge.
Required reading and resources	• Rothman, KJ and Greenland, S. Modern Epidemiology, 3nd edition. Lippincott-Raven, 2008 • Hernan M. Causal Inference, 1st edition. Chapman & Hall/CRC, 2011. Draft chapters available at: http://www.hsph.harvard.edu/faculty/miguel-hernan/causal-inference-book/ • Additional readings as described below
Suggested	For help with SAS programming, goggle is usually very helpful, but

reading and resources	students may also consider referring to the following suggested textbooks: (1) Delwiche, LD & Slaughter, SJ. 2008. The Little SAS Book: A Primer (4th edition). Cary, NC: SAS Institute, Inc. (2) Cody, RP & Smith, JK. 2005. Applied Statistics and the SAS Programming Language (5th edition). Upper Saddle River, NJ: Prentice Hall.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Determine the influence of social, cultural, historical, behavioral and biological factors in population health.	• Conduct in-depth epidemiologic analyses using data from local and public use datasets • Recognize how epidemiologic studies can build upon routine or mandatory administrative data sources	• Papers and student presentations
2. Operationalize studies of the complex interactions between multiple determinants of population health in a variety of settings, exploiting the differences between settings as a source of insight.	• Use descriptive statistics to characterize disease states in the context of an analytic study. • Develop testable research hypotheses using principles from causal theory, including causal diagrams • Operationalize hypotheses into statistical testing strategies	• Papers & student presentations
3. Design and implement research projects that: a. Quantify health and the burden of disease in populations b. Perform surveys and risk factor analyses c. Apply causal inference to study design, study implementation and data analysis d. Identify vulnerable populations and their attributes; apply rigorous methods to examine and monitor health disparities	• Use descriptive statistics to characterize disease states in the context of an analytic study. • Develop testable research hypotheses using principles from causal theory, including causal diagrams • Operationalize hypotheses	• Papers and student presentations

e. Identify effective interventions to improve population health equitably f. Evaluate the effectiveness of interventions designed to improve population health g. Give appropriate attention to the potential for bias, as well as exposure and outcome measurement issues	into statistical testing strategies	
4. Conduct public health surveillance of diseases, events, and health states, as well as their risk factors and drivers.	• Use descriptive statistics to characterize disease states in the context of an analytic study	• Papers and presentations
5. Demonstrate mastery of causal inference and apply these techniques to scientific questions relevant to at least two current public health issues or population groups that are relevant to the student's substantive content interests.	• Develop testable research hypotheses using principles from causal theory, including causal diagrams • Recognize key sources of bias and measurement error in published literature and their potential effects	• Papers and student presentations
6. Identify and apply appropriate biostatistical approaches to analyses that address epidemiological questions in public health research and practice	• Develop capacity to complete in-depth epidemiologic and statistical analyses using SAS	• Papers and student presentations

Course Assessments

Short analytic papers: Students will complete three papers presenting the results of data analysis. All short papers should be 6-8 pages of text (double-spaced, 12-point font, 1 inch margins). Papers must be handed in on paper on the assigned day. If a student is unable to attend class on the day when a paper is due, the paper may e-mail it to the class instructor. The e-mail must be sent before the beginning of the class when the paper is due (i.e. by 6:30 pm). Students e-mailing papers will be sent an acknowledgement of receipt. If you do not receive an acknowledgement within 24 hours of e-mailing the paper, contact the instructor to make sure that the e-mail went through. Late papers will have 5 points deducted for each day they are late (including holidays and weekends. Papers should roughly be organized according to the following format:

Brief introduction/Literature review	(1-2 page)
Methodology	(2-3 pages)
Results	(1-2 pages)
Discussion	(1-2 pages)
Tables & Figures	(1-5, not included in the 10 page limit)
List of Citations	(As many as necessary)
Appendix with annotated SAS syntax	(as many as necessary)

Students may submit as many tables and figures as they wish to accompany this paper to demonstrate their systematic analysis strategy, but recall the power of parsimonious presentation (fewer is sometimes better). Tables may be in formats that are more work-in-progress than typically seen in published journals (for example, explorations of confounding or interaction can be shown). All tables and figures should be numbered and include self-explanatory titles and labels and go at the end of the paper. Tables and figures should be references in the text by table/figure number.

All analysis strategies should involve the following, when appropriate:

a) Basic descriptive epidemiology
b) Univariate analysis
c) Analysis for confounding
d) Analysis for interaction
e) Multivariable model building

Citations MUST be inserted into the paper using citation software (Endnote, Refworks, Zotero), which are available online (Graduate Center: http://libguides.gc.cuny.edu/c.php?g=159565&p=1045007 Hunter: http://library.hunter.cuny.edu/citation-tools). It is strongly suggested that students download (when appropriate) the software and start working with is in the very beginning of the semester to ensure that they are comfortable with the program by the time they start working on papers for the course. Five points will be deducted from papers that do not have the citations inserted using Endnote.

Individual presentations: Students will present the methods and results of each paper so that the different approaches taken can be compared and discussed. Missing a scheduled presentation will results in a zero grade for that presentation.

Group Session: Students will be randomly assigned into teams of 2-3. Each team will be responsible for teaching one class. While the responsible student team will present the material and lead the discussion, it is expected that ALL students will be prepared for and actively participate in the discussion, and participation grades will reflect the level of engagement in these discussions. If a student misses his/her scheduled presentation a grade of zero will be assigned for that component of the grade.

Attendance & class participation: Each student is expected to attend and actively participate in each class. Two absences are allowed with no effect on the participation grade

Grading

Evaluation criteria

The relative weight of each course component is as follows:

Assessment	Weight
Paper 1	25%
Paper 2	25%
Paper 3	25%
Presentation 1	5%
Presentation2	5%
Presentation 3	5%
Group Session	5%
Attendance & Participation	5%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal
If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete
Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals
When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Two absences are allowed with no effect on the participation grade

Late/incomplete submission of assignments

- Late papers will have 5 points (out of 100) deducted for each day they are late (including holidays and weekends
- Students who miss their scheduled presentation (individual or group) will receive a grade of zero which will be averaged into their course grade.

Make-ups, rewrites, and extra credit

There are no make-ups, rewrites, or extra credit assignments. This is an advanced graduate level course and as such it is assumed that students are able to manage their time and complete assignments at the high level expected for such a course.

Expectations of students

• This is an advanced, doctoral level epidemiology methods course. It is assumed that by this point students feel relatively comfortable writing research-style papers and conducting statistical analysis using SAS. Hunter students should be aware that they can bring their laptop computers to the CUNY School of Public Health library and get SAS software loaded for their home use. GC students can access SAS through the

intranet (contact It for support). SAS has an excellent help menu and that there is a large amount of SAS code available online easily accessible through Google. In addition, many publicly available data websites (e.g. the NYCDOH) provide sample SAS code for analyzing data collected using their complex sampling methods. Students should not expect to be given all the SAS code they will need to analyze the data for their papers and should plan to spend time searching for examples of the code they need.

- There are two software packages you will need to have access to in this class: (1) SAS and (2) citation software. Students should arrange access to the software and start using it early in the semester so s to be prepared when they start working on the assigned papers. The software for this course will also be available for student use at the following locations (1) on the laptop computers in the library in the Silberman building should have SAS and Endnote (2) the computer labs at 68th Street should have SAS and Endnote (hours can be found at this link: http://www.hunter.cuny.edu/it/it-services/computer-labs-alias), and the computers in the GC library should have this software. Most students will likely have to schedule time to come to their campus or some other computer lab to complete the class assignments. Students should keep this in mind when deciding when to take this class and in planning their schedules throughout the semester. Not having access to software is not a valid excuse for turning-in an assignment that is incomplete (e.g. does not have citations) or late.
- If a student will not be able to attend a class, assignments due on that day should be e-mailed to the instructor or, when appropriate, posted on BB before the class begins (e.g. before 6:30pm the day of the class) to receive full credit. The instructor will reply when a document is received via e-mail. If a reply is not received by the student he/she should contact the instructor to be sure that the assignment was sent correctly. Students should keep their sent e-mail to demonstrate that the assignment was turned-in and when, in the event that the instructor has a questions about this. Late assignments will receive a penalty in the form of a grade reduction.
- Students must turn in their own, independently written papers. However, students are encouraged to discuss their data analysis approaches and papers with colleagues.

Expectations for the instructor

- Power Point lecture slides will be available for download on Blackboard prior to class.
- Students can expect the instructor to start and end class on-time and give feedback on assignments in a constructive way.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

The course schedule is subject to change throughout the semester.

COURSE SCHEDULE			
Date	**Lecture and Discussion Topics**	**Lab**	**Assignments Due (see below for readings)**
Class 1: Feb 3, 2016	Introduction & statistics review	Review of data analysis with SAS I	
Class 2: Feb 10, 2016	Causality & DAGS	Discussion	
Class 3: Feb 17, 2016	Developing and testing hypotheses & sampling	Data analysis of complex samples in SAS	
Class 4: Feb 24, 2016	Confounding & effect modification	Lab to explore confounding and effect modification	
Class 5: March 2, 2016	Cohort Analysis	Lab to explore person time	PAPER 1 DUE: DESCRITIVE ANALYSIS & HYPOTHESIS TESTING OF A CROSS SECTIONAL STUDY
Class 6: March 9, 2016	Student Presentations More on DAGS	Discussion	Student Presentations
Class 7: March 16, 2016	Model Development & DAGS	Lab to explore modeling	
March 23, 2016 follows a Friday schedule			
Class 8: March 29, 2016	Multilevel models	Lab I to explore neighborhood and multilevel models	
Class 9: April 6, 2016	More on Multilevel Models	Lab II to explore neighborhood and multilevel models	PAPER 2 DUE: ANALYSIS OF DATA FROM A COHORT STUDY
Class 10: April 13, 2016	Student presentation of paper 2 Analysis of case control study data	Lab to explore case control study data with without matching	Student Presentation

	with and without matching		
Class 11: April 20, 2016	Missing Data & Multiple Imputation Guest Lecture by: Matthew Romo, DPharm, MPH	Lab to explore multiple imputation in SAS	
April 22-30, spring recess			
Class 12: May 4, 2016	Internal validity and sensitivity analysis	Lab to explore sensitivity analysis	
Class 13: May 11, 2016	Other topic of interest TBD by class		
Class 14: May 18, 2016	Student presentations of paper 3 Putting it all together	Discussion	Presentation on paper 3
Class 15: May 25, 2016	NO CLASS MEETING		PAPER 3 DUE: NEIGHBORHOOD ANALYSIS

READING ASSIGNMENTS

Class 2 (February 10, 2016): Causality & DAGS
Required readings:
(1) Rothman Text Ch. 2 (Causality) & 6(Causal Diagrams)
(2) Hernan Website Ch. 1 (A Definition of Cause and Effect), Ch. 3 (Observational Studies) & Ch. 6 (Graphical representation of causal effects)
(3) Cornfield J et al. "Smoking and lung cancer: recent evidence and a discussion of some questions" JNCI 1959 (reprint IJE 2009; 38: 1175- 1191)

Recommended readings:
(1) Cox DR. "Commentary smoking and lung cancer: reflections on a pioneering paper" IJE 2009; 38: 1192-1193.
(2) Greenhouse JB. "Commentary: Cornfield, epidemiology and causality" IJE 2009; 38: 1199-1201.
(3) Vandenbroucke JB. "Commentary: 'Smoking and lung cancer'—the embryogenesis of modern epidemiology" IJE 2009; 38: 1193-1196.
(4) Zwahlen M. "'Commentary: Cornfield on cigarette smoking and lung cancer and how to assess causality" IJE 2009; 38: 1197-1198.

Class 3 (February 17, 2016): Developing and Testing Hypotheses & sampling
Required readings:
(1) Rothman Text Ch. 4, pp.51-62 (Measures of Effect), Ch. 10 (Precision) & Ch. 13, pp. 213-219 (Fundamentals of Analysis)
(4) Sakshaug JW & West BT. Important considerations when analyzing health survey data collected using a complex sample design. American Journal of Public Health 2014, 104(1): 15-16.
(5) Martin K. Analyzing Data from Complex Samples Using PROC SURVEYFREQ in SAS® 9.2. Available at: http://www.wuss.org/proceedings10/HOC/Analyzing%20Data%20from%20Complex%20Samples%20Using%20PROC%20SURVEYFREQ%20in%20SAS%C2%AE%209.2.pdf.

Class 4 (February 24, 2016): Confounding & effect modification
Required readings:
(1) Rothman Text Ch. 7 (confounding), Ch. 9 (Validity), Ch. 15 (Introduction to Stratified Analysis)
& Ch. 5 (concepts of Interaction)
(2) Hernan Website Ch. 7 (confounding) , Ch. 4 (Effect Modification) & Ch. 5 (Interaction)
(3) Sun X, Briel M, Walter SD, Guyatt GH. Is a subgroup effect believable? Updating criteria to evaluate the credibility of subgroup analyses. BMJ 2010; 340: 850-855.

Class 5 (March 2, 2016): Cohort Analysis Methods
Required readings:
(1) Rothman Text Ch, 7 (Cohort Studies)
Recommended readings:
(1) Hernan Website Ch. 17 (Causal survival Analysis)
(2) Samet JA. Perspective: cohort studies Epidemiol Rev 1998; 20(1): 135-6.
(3) Doll, Richard 2004 “Cohort studies: history of the method I. prospective cohort studies” pp. 75-86 in A history of epidemiologic methods and concepts, edited by A Morabia.
(4) Doll, Richard 2004 “Cohort studies: history of the method II. Retrospective cohort studies” pp. 152-160 in A history of epidemiologic methods and concepts, edited by A Morabia.

Class 6 (March 9, 2016): More on DAGS
(1) Hernan et al. Causal knowledge as a prerequisite for confounding evaluation: an application to birth defects epidemiology AJE 2002; 155: 176-184.
(2) Fleischer NL, Diez Roux AV. Using directed acyclic graphs to guide analyses of neighborhood health effects: an introduction. JECH. 2008 Sep;62(9):842-6.
(3) Glymour, M. Maria. 2006. "Using causal diagrams to understand common problems in social epidemiology." in Methods in Social Epidemiology, edited by J. Michael Oakes and Jay S. Kaufman. San Francisco: Jossey-Bass / Wiley.

Class 7 (March 16, 2016): Model Development & DAGS

Required readings:
(1) Rothman Text Ch. 20 (Regression Models)
(2) Rothman Text Ch. 21 (Regression Modeling)
Recommended readings:
(1) Hernan Website Ch. 11 (Why Model?)
(1) Donders AR, van der Heijden GJ, Stijnen T, Moons KG. Review: a gentle introduction to imputation of missing values. J Clin Epidemiol 2006;59:1087-1091.

Class 8 (March 29, 2016): Multilevel Analysis
Required readings:
(1) Merlo J, Chaix B, Yang M, Lynch J, Rastam L. A brief conceptual tutorial of multilevel analysis in social epidemiology: linking the statistical concept of clustering to the idea of contextual phenomenon. J Epidemiol Community Health 2005;59:443–449..
(2) Diez-Roux A. The Study of Group-Level Factors in Epidemiology: Rethinking Variables, Study Designs, and Analytical Approaches. Epi Reviews 2004, 26: 104-11
(3) Theall KP et al. Impact of small group size on neighborhood influences in multilevel models. JECH 2010 May 27.
Recommended readings:
(1) Hubbard AE et al. To GEE or not to GEE: comparing population average and mixed models for estimating the associations between neighborhood risk factors and health. Epidemiology. 2010 Jul;21(4):467-74.
(2) Boone-Heinonen J et al. Where can they play? Outdoor spaces and physical activity among adolescents in U.S. urbanized areas. Prev Med. 2010 Jul 22

Class 9 (April 6, 2016): More on Multilevel Models
Required readings:
(1) Merlo J, Chaix B, Ohlsson H, Beckman A, Johnell K, Hjerpe P, Rastam L, Larsen K. A brief conceptual tutorial of multilevel analysis in social epidemiology: using measures of clustering in multilevel logistic regression to investigate contextual phenomena. J Epidemiol Community Health 2006;60:290–297.

Class 10 (April 13, 2016): Case-control analysis methods
Required readings:
(1) Rothman Text Ch. 8 (Case-Control Studies)
(2) Hernan Website Ch. 2 (RCT) & Ch. 3 (Observational Studies)
Recommended readings:
(1) Paneth N and Susser M 2004 “Origins and early development of the case-control study: part 2, The case-control study from Lane-Claypon to 1950” p. 360-365 in A history of epidemiologic methods and concepts, edited by A Morabia.

Class 11 (April 20, 2016): Multiple imputation with SAS
Required Readings
TBD

Class 12 (May , 2016): Internal validity & sensitivity analysis

Required readings:
(1) Hernan Website Ch. 8 (Selection Bias)
(2) Hernan Website Ch 8 (Selection Bias) & 9 (Measurement Bias)
(3) Cole SR et al. Illustrating bias due to conditioning on a collider. IJE 2010; 39:417-420
(4) Greenland S. Basic methods for sensitivity analysis of biases. Int J Epi 1996;2:1107-1116.
Recommended readings:
(1) Bodnar LM, Tang G, Ness RB, Harger G, Roberts JM. Periconceptual vitamin use reduces the risk of preeclampsia. Am J Epidemiol 2006;164:470-477.
(2) Hernán MA, Cole SR. Invited Commentary: Causal diagrams and measurement bias. Am J Epidemiol. 2009 Oct 15;170(8):959-962
(3) Shahar E. "Shahar Responds to ''Causal Diagrams and Measurement Bias'' Am J Epidemiol. 2009 Oct 15;170(8):963-964.

Class 13 (May 11, 2016):
Assigned Readings
TBD

NOTE: Additional readings may be added throughout the semester.

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PUBH 824: Applied Biostatistics I
3 Credits
Spring 2016

Time and location	Thursday, 6:05-7:50 pm, Silberman (2180 3rd Ave), Room C05/C06
Instructor	Hongbin Zhang, PhD CUNY School of Public Health and Health Policy 55 West 125th Street, Room 806 Phone 646-664-8375 hongbin.zhang@sph.cuny.edu (preferred contact)
Office hours	I by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	For public health professionals to be effective, they must be able to ensure that policies and interventions are most effective in promoting healthy individuals, families and societies. Biostatistics provides epidemiologists with the necessary tool kit to appropriately analyze public health data. The emphasis of this class is on acquiring a set of foundational tools in regression models to apply to public health research questions and data. Topics include simple and multiple linear regression, ordinal and polytomous regression and model building techniques including assessing for multi-collinearity, effect measure modification, non-linearity and model fit statistics
Course prerequisites	Graduate-level introductory biostatistics course
Course format	This course is taught with a combination of lectures and in-class computer exercises using SAS. All materials are available on the course website.
Required reading and resources	Ford AC, et al. 2005. *American Journal of Epidemiology* 162:454-460. Hall SL, Greendale GA, 1998. *Calcified Tissue International* 63:183-189. Simanek AM, Dowd JB, Aiello AE. 2009. *International Journal of Epidemiology* 38:775-787. Wisborg K, et al. 2001. *American Journal of Epidemiology* 154:322-327.
Suggested reading and resources	Fox J. *Applied Regression Analysis and Generalized Linear Models. Third Edition*. Sage Publications; 2015. ISBN-10: 1452205663, ISBN-13: 978-1452205663. (Second Edition is also all right.)

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Determine the influence of social, cultural, historical, behavioral and biological factors in population health.	• Discuss planning and evaluating epidemiologic studies, threats to validity and value of the inferences drawn from these studies	• Research Notes 1 & 2
2. Operationalize studies of the complex interactions between multiple determinants of population health in a variety of settings, exploiting the differences between settings as a source of insight.	• Apply methods to determine effect modification, including homogeneity and expected versus observed • Evaluate the predictive accuracy and reliability of the results; and examine if the results are consistent with the statistical assumptions of the methods and models	• Homework 1 & 2 • Research Notes 1 & 2
3. Design and implement research projects that: 1. Quantify health and the burden of disease in populations 2. Perform surveys and risk factor analyses 3. Apply causal inference to study design, study implementation and data analysis 4. Identify vulnerable populations and their attributes; apply rigorous methods to examine and monitor health disparities 5. Identify effective interventions to improve population health equitably	• Describe and explain the model equations, assumptions of linear regression and logistic regression • Understand the difference of estimation procedures of linear regression and logistic regression	• Mid-term and Final Examinations • Homework 1 & 2

6. Evaluate the effectiveness of interventions designed to improve population health Give appropriate attention to the potential for bias, as well as exposure and outcome measurement issues		
Demonstrate mastery of causal inference and apply these techniques to scientific questions relevant to at least two current public health issues or population groups that are relevant to the student's substantive content interests.	• Understand the difference between continuous outcome and binary outcome; • Able to decide the type of model to use for confounding model or for prediction model; • Compare different methods for identifying confounders	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Identify and apply appropriate biostatistical approaches to analyses that address epidemiological questions in public health research and practice.	• Interpret results of linear regression and logistic regression analyses; assess the extent to which the results support the initially proposed hypothesis; • Compare the interpretation of absolute and relative risk	• Mid-term and Final Examinations • Homework 1 & 2 • Research Notes 1 & 2
Present empiric findings persuasively to a wide array of audiences (oral and written)	• Write scientific reports of linear regression and logistic regression analyses, with properly formatted and labeled tables and figures; • Write scientific reports of linear regression and logistic regression analyses, with essential components	• Research Notes 1 & 2
Work with colleagues to translate epidemiologic findings into practicable interventions	• Discuss planning and evaluating epidemiologic studies, threats to validity and value of the	• Research Notes 1 & 2

	inferences drawn from these studies	
Teaching epidemiologic methods to students, more junior colleagues or others in public health	• Describe and explain the model equations, assumptions of linear regression and logistic regression • Understand the difference of estimation procedures of linear regression and logistic regression	• Research Notes 1 & 2

Course Assessments

Descriptions on details about the assignments and grading criteria will be shown on the course website

Mid-term Examination: Students will take an in-class examination, solving technical and computational problems that are mostly related to linear regression analysis.

Final Examination: Students will take an in-class examination, solving technical and computational problems that are mostly related to logistic regression analysis.

Homework 1: Students will solve a set of technical and computational problems that are mostly related to linear regression analysis and submit the answers.

Homework 2: Students will solve a set of technical and computational problems that are mostly related to logistic regression analysis and submit the answers.

Research Note 1: A subset of data from a health survey will be provided. Each student will develop a hypothesis that could be investigated with the data, analyze the data using linear regression, and write a research report.

Research Note 2: A subset of data from a health survey will be provided. Each student will develop a hypothesis that could be investigated with the data, analyze the data using logistic regression, and write a research report.

In-class Computer Exercises: During the last 30~40 minutes of most classes, students will do computer exercises using computer terminals in C08, and upload their output files onto the assigned location of Discussion Board of the course website or submit them to the instructor by email after the class. The output files may be edited to remove results with errors.

Class Participation: Students should actively participate in the classes by asking questions to the instructor and orally responding to questions from the instructor during the lecture and in-class exercise.

Grading

<u>Evaluation criteria</u>

Evaluation criteria for research notes are described in the assignment instructions, which will be posted on the course website. Homework and in-class examinations are assessed primarily with respect to the accuracy of answers and the appropriateness of the approach adopted to solve the problems. Class participation is assessed in terms of the quality and frequency of questions and replies; and the in-class computer exercises completeness.

The relative weight of each course component is as follows:

Assessment	Weight
Mid-term in-class examination	20%
Final in-class examination	20%
Research note 1	20%
Research note 2	20%
Homework 1	3%
Homework 2	3%
Homework 3	4%
In-class exercise and class participation	10%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Attendance is required. No student will get a full point for "in-class exercise and class participation" if s/he misses more than 3 classes or the number of in-class exercise outputs that are not submitted in time is 3 or more.

Late/incomplete submission of assignments

Late/incomplete submission of Research Notes is not accepted. Late submission of Homework is not accepted. In-class exercise outputs are accepted if they are submitted by the end of the class or within 4 days after the class.

Make-ups, rewrites, and extra credit

With permission of the instructor, students may be allowed to resubmit research notes, homework assignments, and in-class computer exercise outputs before the due date.

Expectations of students

- Be familiar with college academic policies and deadlines, including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use library resources and citation tools.
- Show respect to everyone in the course.
- Classes are offered in a computer laboratory. During the class, NEVER do any email work or website browsing unrelated to the class.
- Complete all assignments by their assigned due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check the course website and official university email for course correspondence.
- There is no group discussion in this course, but students are expected to participate actively in the classes, by asking scientific and technical questions to the instructor if there are any unclear issues, and by responding to questions from the instructor.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.
- Because in-class exercise outputs and homework assignments 1 and 2 are not returned with corrections or comments, students are expected to compare their outputs and answers with the model scripts/outputs and answer keys that will be posted on the course website.

Expectations for the instructor

- Provide course materials (including presentation files, data files, computer programs, assignment instructions, copies of or links to articles in the required reading list), regular announcements, reminders, suggestions on the course website.
- Answer questions asked by students during the class.
- Respond to students' email inquiries within 2 days.
- Provide students with individualized in-person instructions during their appointment visits.
- Communication about grades and progress in the course will be given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

- This schedule may change as the semester progresses. Refer to the current academic calendar for important dates.
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Session	Date	Topic	Readings/Resources	Assessment
1	2/4	Introduction to multiple linear regression 1: Basic models and partial regression coefficients (Part 1)	JF 5	ICE
2	2/11	Introduction to multiple linear regression 1: Basic models and partial regression coefficients (Part 2)	JF 5; HG	ICE
	2/18	Last day to drop without a grade of "W"		
3	2/25	Introduction to multiple linear regression 2: Categorical independent variables	JF 7.1-2	ICE
4	3/3	Introduction to multiple linear regression 3: Ordinary least squares and R^2	JF 5	ICE
5	3/10	Introduction to multiple linear regression 4: Statistical inference.	JF 6.1-2	ICE Homework 1 assigned
6	3/17	Issues in regression analyses 1: Examination of hypotheses on causal relationships I. Explanation of RN1. HW1 answers	JF 6.3 & 1.2	Homework 1 due Research Note 1 assigned
7	3/24	Issues in regression analyses 2: Nonlinearity (Mid-term in-class examination)	JF 12.3	Mid-term in-class examination
8	3/31	Introduction to logistic regression 1: Basic models	JF 14.1	ICE
9	4/7	Introduction to logistic regression 2: Adjusted odds ratio	JF 14.1; AF; KW	ICE Research Note 1 due
	4/11	Last day to withdraw with a grade of 'W'		
10	4/14	Issues in regression analyses 3: Interaction	JF 7.3	ICE
11	4/21	Introduction to logistic regression 3: Maximum likelihood estimation.	JF 14.1.4-5	
	4/28	Spring Recess (no class)		
12	5/5	Issues in regression analyses 4: Examination of hypotheses on causal relationships II.	SDA	ICE Homework 2 assigned

				Research Note 2,3 assigned
13	5/12	Introduction to logistic regression 4: Ordinal and polytomous logistic regression.	JF 14.2	ICE Homework 2, 3 due
14	5/19	(Final in-class examination)		Final in-class examination
15	5/26	Issues in regression analyses 5: Multi-collinearity, stepwise regression, partial and part correlation	JF 13	ICE
	5/28			Research Note 2 due

- Keys: AF = Ford et al. 2005; HG = Hall & Greendale 1998; ICE = In-class computer exercise; JF = recommended textbook by John Fox; KW = Wisborg et al. 2001; SDA = Simanek Dowd & Aiello 2008.

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PUBH 826: Applied Biostatistics III

3 Credits
Spring 2016

Time and location	Tuesdays 4.15-6.15 pm Room C196.02 (Graduate Center)
Instructor	Katarzyna Wyka, PhD: kwyka@hunter.cuny.edu (response time 24-48 hours)
Office hours	Mondays 4.30-6PM (room 537, Silberman Building) or by appointment
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	This course covers intermediate statistical methods that are increasingly used in public health research. Topics include extensions of generalized linear models to correlated data (Generalized Estimating Equations and Generalized Linear Mixed Models) and application of instrumental variables to causal inference. Missing data imputation methods are also discussed. Focus on practical applications, utilizing statistical software.
Course prerequisites	PUBH 825 or its equivalent
Course format	This is a lecture-lab course. Topics are presented by the instructor and labs are completed by students during class. All materials are posted on Blackboard. Students complete data analysis projects and present their analyses in class.
Required reading and resources	Data Analysis Using Regression and Multilevel/Hierarchical Models by Andrew Gelman and Jennifer Hill. Paperback: 648 pages Publisher: Cambridge University Press; 1 edition (December 18, 2006) ISBN-10: 052168689X ISBN-13: 978-0521686891 Price on Amazon.com: $55.20
Suggested reading and resources	Access to SAS and R statistical software. Additional readings are listed under Course Schedule on p. 5.

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be assessed as part of the following course assignments:
Determine the influence of social, cultural, historical, behavioral and biological factors in population health.	• Identify research questions posed in published reports • Critique the analytic approach and data presentation in published research • Reflect intelligently on the limitations inherent in both the data under study as well as the statistical methods used to analyze the data • Compare and contrast the similarities and difference of intermediate - statistical methods and their use in addressing various research questions	Reports 1, 2 and 3
Identify and apply appropriate biostatistical approaches to analyses that address epidemiological questions in public health research and practice.	• Show competency in techniques related to the analysis of correlated public health data • Explain the assumptions necessary for statistical inference in Generalized Estimating Equations (GEE), Generalized Linear Mixed Models and instrumental variable framework • Implement and interpret a meta-analysis • Apply statistical techniques related to missing data problem • Show competency in assessing model fit and model building • Master the use of statistical software for analysis of public health data • Interpret computer output from GEE, mixed models and instrumental variable analyses • Interpret computer output from missing data imputation problems	Reports 1, 2 and 3
Demonstrate mastery of causal inference and apply these techniques to scientific questions relevant to at least two current public health issues or population groups that are relevant to the student's substantive content interests.	• Implement instrumental variable analysis and propensity score matching analysis and explain their relevance to causal inference	Reports 1, 2 and 3
Present empiric findings persuasively to a wide array of audiences (oral and written)	• Produce data analysis reports of the highest quality as to their conciseness, readability and cohesion • Create appropriate tables and figures that adequately convey the key points of statistical analysis • Present your findings orally clearly and effectively • Incorporate feedback into an improved data analysis report after in class "peer review"	Reports 1, 2 and 3

Last updated 1.29.15

Course Assessments

Your understanding of the course material will be evaluated through a total of three (3) data analysis reports. Each report will consist of 3 problems. Doctoral level students must solve all 3 problems. Each student will be expected to present his/her results in class and actively participate in the constructive critique/review of the work of his/her peers. You will have the chance to revise and resubmit each report after the first round of critique/review. This will give you the chance to deepen your analysis and bolster your mastery of the statistical methods.

Grading

Evaluation criteria
All assignments will be evaluated based upon rubrics found on the course website.

The relative weight of each course component is as follows:

Assessment	Weight
Report 1	30%
Report 2	30%
Report 3	30%
Attendance and class participation	10%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Points	Percentage
A+	4.0	100-98
A	4.0	97-93
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B+	3.3	89-88
B	3.0	87-83
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C	2.0	77 - 73
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Last updated 1.29.15

Course Policies

Attendance and class participation

Regular weekly attendance is strongly advised. Your absence is detrimental not only to your performance but also to that of your colleagues, who benefit from your important feedback during in-class discussions.

Late/incomplete submission of assignments
- Late reports will not be accepted under any circumstance.
- A full letter grade will be deducted if a student fails to show up on the day his/her data analysis presentation is scheduled.

Make-ups, rewrites, and extra credit
There are no make-ups, rewrites, or extra credit allowed.

Expectations of students
- Check email and Blackboard announcements on weekly basis
- Access course materials on weekly basis
- Complete and submit reports on time
- Participate in class discussion board

Expectations for the instructor
- Provide regular announcements and reminders on the course website and via email
- Respond to student email within 24-48 hours Monday through Friday
- Grade and provide feedback on assignments within 1 week of the due date
- Communicate grades and progress through Blackboard (My Grades)

Accessibility
Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

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Last updated 1.29.15

Course Schedule

The preliminary schedule of lectures below is meant to serve as a guide. Depending on the class needs, interests, and progress during the semester, some topics may be given more or less class time than others. Accordingly, the scheduling of in-class presentations and the due dates of reports may vary.

Important dates

- LAST DAY TO DROP CLASS WITH THE GRADE OF "W": February 18th
- LAST DAY TO DROP CLASS WITH THE GRADE OF "W": April 11th

Refer to the academic calendar for other important dates.

Date	Lecture	Topic	Reading & Assignments
2/2	#1	**Models for correlated data** Extending GLM: Generalized Estimating Equations (GEE) • Models for Continuous outcomes • Models for Binary outcomes Generalized Linear Mixed Models (GLMM) • Variance components • Random intercept model	Gelman & Hill chapter 12 Diez-Roux AV. Multilevel analysis in public health research. Annual Review of Public Health 2000; 21:171-92. Hubbard AE, Ahern J, Fleischer NL, Van der Laan M, Lippman SA, et al. To GEE or Not to GEE. Comparing population average and mixed models for estimating the associations between neighborhood risk factors and health. Epidemiology 2010; 21:467-474. Online resources for GLMM
2/16	#2	**Models for correlated data** Generalized Linear Mixed Models (GLMM) • Random intercept and slope • Strategies for Model Building	Gelman & Hill chapter 13.1-13.2, 13.4-13.5 Singer J. Using SAS Proc Mixed to fit multilevel models, hierarchical models, and individual growth models. Journal of Educational and Behavioral Statistics 1998; 24:323-355. Gary-Webb TL, Baptiste-Roberts K, Pham L, Wesche-Thobaben J, Patricio J, et al. Neighborhood and weight-related health behaviors in the Look AHEAD (Action for Health in Diabetes) Study. BMC Public Health 2010; 10: 312.
2/23	#3	**Models for correlated data** Generalized linear mixed models (GLMM) • Multilevel logistic regression • Diagnostics for GLMM	Gelman & Hill chapter 14.1-14.2 Ene M, Leighton EA, Blue GL, Bell BA. Multilevel Models for Categorical Data Using SAS Proc GLIMMIX: SESUG 2014, Paper 134-2014.
3/1	#4	**Models for correlated data** Generalized linear mixed models (GLMM) • Models for longitudinal data • Mediation analysis	Gelman & Hill chapter 11.3 Landerman RL, Mustillo SA, Land KC. Modeling repeated measures of dichotomous data: testing whether the within-person trajectory of change varies across levels of between-person factors.

			Social Sciences Research 2011; 40(5), 1456-1464. Valeri L, VanderWeele TJ. Mediation analysis allowing for exposure-mediator interactions and causal interpretation: theoretical assumptions and implementation with SAS and SPSS macros. Psychological Methods 2014; 18(2): 137-150.
3/8	#5	**Meta-Analysis** • Fixed vs. random effects models • Reporting the results of meta-analysis • Criticism of meta-analysis	Vandenbroucke JP, von Elm E, Altman DG, Gotzsche PC, Mulrow CD, et al. Strengthening the reporting of observational studies in epidemiology (STROBE): Explanation and elaboration. Annals of Internal Medicine 2007; 147:163-194. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic Review Journal 2015; 4:1. Lies, Damned Lies, and Medical Science, November 2010 ATLANTIC MAGAZINE http://www.theatlantic.com/magazine/archive/2010/11/lies-damned-lies-and-medical-science/8269/
3/15	#6	**Report 1 discussion**	**Report 1 draft due**
3/22	#7	**Causal Inference-review** • Causal Inference in Experimental designs & Observational studies • Propensity score matching	Gelman & Hill chapter 9, 10.1-10.4 Little R, Rubin D. Causal effects in clinical and epidemiological studies via potential outcomes: concepts and analytical approaches. Annual Review of Public Health 2000; 21:121–45. Austin PC. An introduction to propensity score methods for reducing the effect of confounding in observational studies. Multivariate Behavioral Research 2011; 46:399-424. **Report 1 due**
3/29	#8	**Casual inference-Instrumental variables** • Definition of Instrumental Variables • Instrumental variables in regression framework	Gelman & Hill 10.5-10.6 Greenland S. An introduction to instrumental variables for epidemiologists. International Journal of Epidemiology 2000; 29: 722-729. Hirano K. Imbens GW, Rubin DB, Zhou XH. Assessing the effect of an influenza vaccine in an encouragement design. Biostatistics 2000; 69-88.

4/5	#9	**Casual inference-Instrumental variables (online)** • Pitfalls (e.g. problem of weak instruments) • Introduction to Mendelian randomization	Hernan MA, Robins JM. Instruments for causal inference - An epidemiologist's dream? Epidemiology 2006;17(4): 360-372. Davey Smith G, Ebrahim S. Mendelian randomization: can genetic epidemiology contribute to understanding environmental determinants of disease? International Journal of Epidemiology 2003; 32: 1-22.
4/12	#10	**Casual inference-Instrumental variables** • Clustered Encouragement designs • Regression Discontinuity designs	Gelman & Hill 10.4 Taylor L, Zhou X. Methods for clustered encouragement design studies with noncompliance and missing data. Biostatistics 2011; 12(2): 313-326. Pennell ML, Hade EM, Murray DM, Rhonda DA. Cutoff designs for community-based intervention studies. Statistics in Medicine 2011; Vol 30(15), 1865–1882.
4/19	#11	**Report 2 discussion**	**Report 2 draft due**
4/26	#12	**Missing data analysis** • Missing data mechanisms • Simple techniques (listwise deletion, available case, LVCF, mean imputation, dummy variable methods) • More advanced techniques (weighting, hotdecking)	Gelman & Hill 25.1-25.6 Donders AR, van der Heijden, Stijnen T, Moons KG. Review: A gentle introduction to imputation of missing values. Journal of Clinical Epidemiology 2006; 59: 1087-1091. **Report 2 due**
5/3	#13	**Missing data analysis** • Building blocks of multiple imputation (regression imputation, regression imputation with noise)	Su Y, Gelman A, Hill J, Yajima M. Multiple imputation with diagnostics (mi) in R: Opening windows into the Black Box. Journal of Statistical Software; 2011, 45 (2)
5/10	#14	**Missing data analysis** • Multiple imputation in practice • Diagnostics	
5/17	#15	**Report 3 discussion**	**Report 3 due**

PUBLIC HEALTH ECONOMICS
DOCTOR OF PUBLIC HEALTH PROGRAM
CUNY - GRADUATE CENTER

PUBH 842
Public Health Economics
3 credits

Catalogue Description	The broad literature on health economics to improve the understanding of issues related to public health. The emphasis of on acquiring a set of devices from the economic theory and a framework within which to organize empirical analysis to inform policy. Analysis of the overall health market, demand for health, health care and insurance; the supply of health care and insurance; the market structure of the health care sector; and performance of the health care sector.
Course Meets	Tuesdays from 6:30 to 8:30 pm Room TBD
Instructor	Juan J. DelaCruz, PhD Associate Professor Department of Economics and Business Lehman College - CUNY E-mail: JDelaCruz@gc.cuny.edu Phone: 718-960-8159 & 917-676-1721
Office	Room 3317 – Graduate Center
Office Hours	Tuesdays from 5:00 to 6:30 pm or by appointment
Pre-requisites	N/A

Overview

Public Health Economics is an advanced graduate-level course covering selected topics in the intersection of two major disciplines, economics and public health. A solid understanding of microeconomic theory and basic econometrics will be sufficient for understanding the main concepts and ideas in the lectures and readings; such basic theory will be addressed briefly in the lectures. In some cases a more advanced treatment of topics is appropriate, in which cases the relevant concepts or methodologies will be taught alongside the applied material. The **expectations** for written assignments and examinations are for exposition at the level of one prepared accordingly in microeconomics. Students who are unsure about their methodological

preparedness for the course are encouraged to discuss this with Prof. DelaCruz at an early date, via e-mail or Skype (ID: juanjc147).

Required Textbook

- Sloan, F. and Hsieh, CR, Health Economics, MIT Press, (mandatory), ISBN: 9780262016766 (hardcover), ISBN: 9780262301879 (E-Book). This book is available for online purchase at the MIT Press website (https://mitpress.mit.edu/books/health-economics)
- Varian, Hal R, Intermediate Microeconomics: A Modern Approach, 8th Edition, WW Norton (Publisher). Only for selected chapters (I can share my copy)
- Folland, Sherman; Goodman, Allen and Stano, Miron, "The Economics of Health and Health Care", 7th Edition, Pearson, ISBN: 0-13-277369-4 (suggested complement)
- Other readings, video-presentations and related materials will be posted on Blackboard

CUNY School of Public Health HPM Competencies and Course Learning Objectives to Attain Competencies

Health Policy and Management Track Program Competencies	Course Learning Objectives	Assessment Methods
Assess and analyze the impact of public policy interventions within the various domains of public health, the theoretical motivations for undertaking them, the influence of the political, bureaucratic, and social environmental in which policy decisions are made, the consequences of such decisions.	a) Contextualize the role of economics as an analytical tool to study issues related to population health and in the decision-making process of health markets	a) In-class discussion b) Written reflections (formal or informal) c) Wrappers using reflective questions
Understand and analyze the policy environment for healthcare organizations.	b) Understand the mechanisms of supply and demand of health care, emphasizing the key role of stakeholders such as patients, physicians, hospitals, nurses and pharmaceutical manufacturers in health markets	a) In-class discussion b) Problem sets on microeconomics and health economics c) Online learning modules in the course managing system (Blackboard)
For healthcare and public health organizations, discuss how each of the following affect organizational behavior and service delivery: organizational structure, motivation and incentives, individual and group behavior, group decision making,	c) Analyze the different market structures (monopoly, oligopoly, and monopolistic competition) and potential market failures (asymmetric information, adverse selection, public goods, etc.) influencing the provision of	a) In-class discussion b) Written reflections (formal or informal) c) Individual presentations d) Problem sets on microeconomics and

quality measurement and improvement, and organizational relations with their environments. Develop interventions to change at least 3 of the above to improve health care and public health service delivery and health outcomes.	health care across individuals	health economics
Understand and appropriately apply analytical strategies used in health policy research, such as costing analysis, cost effectiveness and cost benefit analysis.	c) Examine issues associated with economic evaluation methods in healthcare (cost-benefit, cost-effectiveness)	a) In-class discussion b) Baseline assessment on student's research interest c) Investigative project
Develop familiarity with and critically analyze federal, state, and municipal laws/regulations and their historical context as relevant to public health management and policy decisions.	d) Describe the links between government and determinants of demand for health, health care services and private health insurance	a) In-class discussion b) Investigative project c) Research portfolio
Formulate alternative options for resolving problems in health policy or management, evaluate their economic, practical, ethical, legal, administrative, and technical feasibility and recommend preferred options based on and supported by your analysis.	e) Provide evidence-based and background approaches on health economics that relates to student's area of research	a) In-class discussion b) Final paper relating the student's research line with economics c) Use of statistical methods or a good understanding of the methodology is strongly advised

Assignments and Assessment

The class is lecture style (instructor and possibly guest speakers) as well as participatory discussion, commentary. The course is also reading-intensive (mandatory, for discussion and complementary). Each week there will be a set of readings or assignments listed in the syllabus or to be posted on Blackboard. Many will be drawn from the bibliography listed below. Notice that not all assigned readings will be covered during the lectures but that students are responsible for covering such readings in their preparation for examinations, and final paper.

Given the fast-changing, dynamic nature of the health and healthcare systems, students are strongly encouraged to read regularly the health-related reporting in publications like peer-reviewed journals and media outlets such as *The Wall Street Journal, CNN, Bloomberg News, Foxnews* and others.

1. (25% of semester grade): 2 paper presentation with meaningful analysis taken from the additional readings list in each class. You are expected to read a paper and summarize the goals, main findings and methodological approach, including a brief description of statistical devises.
2. (25% of semester grade): A comprehensive **midterm exam** based on the lectures and readings stated in the first part of the syllabus. The time and place for the final exam will be announced.
3. (25% of semester grade): A comprehensive **final exam** based on the lectures and readings stated in the second part of the syllabus. The time and place for the final exam will be announced.
4. (25% of semester grade): **Final Paper.** The student must indicate, among other things, what topic is being addressed and why the selected paper is (or is not) an important contribution to the topic area. A clear inclusion of a methods section with statistical analysis and underlying theory is entirely appropriate and encouraged. The paper will be graded on the basis of its arguments and quality of exposition. If in doubt about the suitability of a paper, or if you would like some guidance on selecting a topic, please contact Prof. DelaCruz. **This paper is due not later than Tuesday May 17th, 2016, 8:30 PM EST**. Since it is possible to begin work on this paper at any time during the semester, there will be **no accommodations** for late papers **for any reason**. Papers handed in after the due date will have their grades **reduced by 10%** for each day the paper is late. The paper must be submitted both electronically (uploaded in Blackboard) and in a hardcopy.

Class citizenship & rules of conduct
Please turn your cell phones off prior to class. If you have an emergency that warrants your being available to persons outside the class, such as a family emergency, please let me know at the beginning of class. Then, turn your cell phone to silent mode and leave class if you need to take a call. If you bring a laptop to class with you, please use it ONLY to take notes or for related purposes.

Email correspondence
I ask that when you write to the instructor or teaching assistant, you include a full descriptive subject line for your emails, since we have an enormous volume of email correspondence each day. I will return your email as quickly as possible.

Academic Integrity
Cheating and plagiarism are serious offenses. Cheating is the attempted or unauthorized use of materials, information, notes, study aids, devices or communication during an academic exercise. Plagiarism is the act of presenting another person's ideas, research or writing (including material drawn from websites) as your own:

1. Copying another person's actual words without the use of quotation marks and footnotes (a functional limit is four or more words taken from the work of another)
2. Presenting another person's ideas or theories in your own words without acknowledging them.
3. Using information that is not considered common knowledge without acknowledging the source.
4. Failure to acknowledge collaborators on homework and laboratory assignments.

My policy is to give a failing grade to any assignment that has been plagiarized and your final grade will be reduced by the percentage the assignment was worth. There are several free online resources to address plagiarism and ways to avoid it. A simple Google search will be helpful to identify those sources.

Schedule

Date	Topic	Additional Readings:
2/02	1) Introductory remarks to Public Health Economics	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 1 (mandatory) Grossman, M (2000), The Human Capital Model, in the Handbook of Health Economics, Vol. 1, Elsevier Mankiw/Rommer/Weil (1992), A Contribution to the Empirics of Economic Growth, The Quarterly Journal of Economics, Vol. 107, No. 2 Barro, Robert (1996), Health, Human Capital and Economic Growth, Pan-American Health Organization (PAHO) Becker, GS, Philipson, TJ and Soares, RR, 2005, "The Quantity and Quality of Life and the Evolution of World Inequality", American Economic Review, 95 (1), pp. 277-291 Cutler, D, Deaton, A and Lleras-Muney, A, (2006), "The Determinants of Mortality", Journal of Economic Perspectives, 20 (3), pp. 97-120
2/16	2) The Demand for Health Care I	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 2-4 (mandatory) Buchmueller, TC. 2006. "Consumer Demand for Health Insurance." NBER Reporter Research Summary, Summer 2006: Cambridge, MA: NBER. Cockx, B and Brasseur, CB, 2003, "The Demand for Physician Services: Evidence from a Natural Experiment", Journal of Health Economics, 22 (6), pp. 881-913 Goldman, DP, et al, 2004, "Pharmacy Benefits and the Use of Drugs by the Chronically Ill" Journal of the American medical Association, 291 (19) pp. 2344-2350
2/23	3) The Demand for Health Care II	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 2-4 (mandatory)

		Finkelstein, A and McGarry, K, 2006, "Multiple Dimension of Private Information: Evidence from the Long Term Care Insurance Market", American Economic Review, 96 (4), pp. 938-958 Aviva Aron-Dine, Liran Einav, Amy Finkelstein, and Mark Cullen, "Moral Hazard in Health Insurance: Do Dynamic Incentives Matter?", Review of Economics and Statistics, 97(4): 725-741 Acton, JP (1975), "Nonmonetary Factors in the Demand for Medical Services", Journal of Political Economy 83: 595-614
3/01	4) The Supply of Health Care I * Physicians * Hospitals	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 5-6 (mandatory) Scholz, S Graf Von Schulemburg, JM and Greiner, W (2015), Regional Differences of Outpatient Physician Supply as a Theoretical Economic and Empirical Generalized Linear Model, Human Resources Health, Nov 17; 13(1):85 Gorey, KM et al (2015), "Colon cancer care and survival: income and insurance are more predictive in the USA, community primary care physician supply more so in Canada", Oct 29; 14(1):109 Stabile, M et al (2013), "Health care cost containment strategies used in four other high-income countries hold lessons for the United States", Health Affairs, 32(4):643-652
3/08	5) The Supply of Health Care II * Quality of care *Nurses and LT care	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 7-8 (mandatory) Cawley, J, Grabowski, DC and Hirth, R, 2006, "Factor Substitution in Nursing Homes", Journal of Health Economics, 25 (2), pp 234-247 Chou, SY, 2002, "Asymmetric Information, Ownership and Quality of Care: An Empirical Analysis of Nursing Homes", Journal of Health Economics, 21 (2), pp. 293-311
3/15	6) The Supply of Health Care III * Pharmaceutical * Private Insurance	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 9-10 (mandatory) Danzon, PM and Furukawa, MF, 2003, "Prices and Availability of Pharmaceuticals: Evidence from Nine Countries", Health

		Affairs Web Exclusive, W3:521-536 Philipson, TJ and Sun, E, 2008, "Is the Food and Drug Administration Safe and Effective?", Journal of Economic Perspectives, 22 (1):85-102 Ridley, DB, Grabowski, HG and Moe, J, 2006, "Developing Drugs for Developing Countries", Health Affairs, 25 (2):313-324 Berndt, E. and J.P. Newhouse. 2010. "Pricing and Reimbursement in U.S. Pharmaceutical Markets." NBER W.P. 16297. 4
3/22	First Comprehensive Test	Chapters 2 - 10
3/29	8) Market Structures in Health Care I * Private Financing * Monopoly * Monopoly Behavior	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 11 (mandatory) Varian, Hal R., Intermediate Microeconomics: A Modern Approach, 8th Edition, WW Norton (Chapters 25 and 26)
4/05	9) Market Structures in Health Care II * Government Financing * Oligopoly * Externalities	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 12 (mandatory) Varian, Hal R., Intermediate Microeconomics: A Modern Approach, 8th Edition, WW Norton (Chapters 28 and 35)
4/12	10) Market Structures in Health Care III * Public Supply and Financing * Public Goods * Asymmetric	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 13 (mandatory) Varian, Hal R., Intermediate Microeconomics: A Modern Approach, 8th Edition, WW Norton (Chapters 37 and 38)

	Information	
4/19	11) Cost and Cost-Effectiveness Analysis	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 14 (mandatory) Goldie, SJ et al, 2006, "Cost-Effectiveness of HIV Treatment in Resource-Poor Settings: The Case of Cote D'Ivoire", New England Journal of Medicine, 355 (11), pp. 1141-1153 Goldie, SJ, et al, 2007, "Cost-Effectiveness of HPV 16, Vaccination in Brazil", Vaccine, 25 (33), pp. 6257-6270 Khan, J, Marseille, E and Auvert, B, 2006, "Cost-Effectiveness of Male Circumcision for HIV Prevention in South African Setting" PLoS Medicine, 3 (12), pp. 2349-2358
5/03	12) Measuring Benefits and Cost-Benefits	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 15 (mandatory) Hirth, RA et al, 2000, "Willingness to Pay for a Quality Adjusted Life Year: In Search of a Standard", Medical Decision Making, 20 (3), pp. 332-342 Jeuland, M et al, 2009, "A Cost-Benefit Analysis of Cholera Vaccination Programs in Beira, Mozambique" World Bank Economic Review, 24 (1), pp. 89-124 Viscusi, WK and Aldy, JE, 2003, "The Value of a Statistical Life: A Critical Review of Market Estimates through the World", Journal of Risk and Uncertainty, 27 (1), pp. 5-76
5/10	13) Health and Economic Growth	Sloan, FA & Hsieh, CR, Health Economics, MIT Press, 2012, chapter 16 (mandatory) Bhattacharya, J and Lakdawalla, D, 2006, "Does Medicare Benefit the Poor? Journal of Public Economics, 90 (1-2), pp. 277-292 Chou, SY, Lui, JT and Hammitt, JK, 2003, National Health Insurance and Precautionary Savings: Evidence from Taiwan", Journal of Public Economics, 87 (9-10), pp. 1873-1894 Hoel, M, 2007, "What Should (Public) Health Insurance Cover?", Journal of Health Economics, 26 (2), pp. 251-262

		McClellan, M and Skinner, J. 2006, "The Incidence of Medicare", Journal of Public Economics, 90 (1-2), pp. 257-276
5/17	14) Final Comprehensive Test	Chapters 11-16
5/24	15) Final paper and individual presentations	

DPH HPM SPECIALIZATION

CUNY SCHOOL OF PUBLIC HEALTH

Graduate Center
PUBH 851 - Health and Social Policy Research for Social Justice
3 credits
Spring 2016

Catalogue description	This seminar-format course will help participants to shape a research idea, find appropriate data sources, perform statistical analyses, and draft a manuscript for submission to a scholarly journal. The focus will be on quantitative research methods. It will also touch on how to gain public attention for the findings after publication, and advocate and organize for appropriate policy changes.
Course meets	Location, Monday 6:30-8:30
Instructor	Professors Steffie Woolhandler, MD, MPH and David Himmelstein M.D.
Email	swoolhan@hunter.cuny.edu and dhimmels@hunter.cuny.edu
Phone	212-289-0630 (prefer email)
Office	Room number & location
Office hours	Woolhandler: Monday 5:30-6:25 pm at GC 3317 by appointment Himmelstein: Monday 5:30-6:25 pm at GC 3317 by appointment
Required books	None
Recommended books	None
Reserve material	None
Other required materials	None
Pre-requisites	N/A

Assessment
Your understanding of the course material will be evaluated through class participation and in-class presentations of your own (or your team's) work.

Course policies [such as]
Grading

		(Dates, if applicable)
%	Assignments	
%	Exams, quizzes	
%	Term project	
80%	Class participation	
%	Final exam	
20%	Other – In-class presentation of your work	

%
%
100%

Attendance and class participation: Students are expected to attend class regularly, participate actively, supportively and critically in discussions, and to be prepared to present the results of their literature reviews and analyses.

Lateness and absences: More than one absence per semester requires specific permission from the instructors. We expect all students to be present throughout the class session.

Late submission of assignments: Discuss with Instructors

Class citizenship & rules of conduct: Active and supportive participation in discussions is expected

Cellphones – Off please

Institutional policies (see: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf)

Accessibility; In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call: (212) 772- 4857 or (212) 650-3230. http://www.hunter.cuny.edu/studentservices/access.

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. Those eligible include students with mobility, visual and hearing impairments. It also includes students with learning disabilities, psychiatric disorders or any medical condition that limits one or more of life's basic functions.

Academic integrity:
Academic dishonesty is prohibited in The City University of New York. Penalties for academic dishonesty include academic sanctions, such as failing or otherwise reduced grades, and/or disciplinary sanctions, including suspension or expulsion. Please see the Student Handbook at the website indicated above for detailed definitions and procedures.

Help with research and writing – Techniques for research and writing will be discussed throughout the seminar,

Last day to drop the course with the grade of "W": Wednesday, September 17

Grade of incomplete: THERE IS NO ABSOLUTE RIGHT TO A GRADE OF INCOMPLETE. Only students averaging B or above in a course are eligible to request an incomplete course grade. Graduate students have one academic year in which to submit the missing work otherwise the IN grade is permanent on the college transcript. A specific, written agreement between the instructor and the student that details the requirements for making up the incomplete is also required. *This is a schoolwide policy.*

Grade appeals:
A student believing himself or herself aggrieved by a grade given for nonacademic reasons should first informally discuss the matter with the instructor.

If the matter is not informally resolved, the student shall, within 30 days of receiving written notification of the failure to reach a resolution, request in writing that a determination be made by the Executive Committee of the program. The student may submit any evidence or argument in writing to the committee and may, if he or she chooses, be heard in person. The committee shall consider the matter de novo and make such investigation as it deems necessary. It shall advise the student within a reasonable time of its determination.

A student may appeal the Executive Committee's determination to the Provost's Office within 30 days of receiving written notification of the determination. The Provost's Office shall review the record and make a determination thereon, which shall be final.

Schedule - Tentative

Session	Date	Topic	Readings and Assignments
1	February 2	Introduction to seminar participants and their research interests	
2	February 16	Student presentations	To be assigned based on student research interests and topic, for this and all subsequent sessions
3	Feb4uary 23	Student presentations	
4	March 1	Student presentations	
5	March 8	Student presentations	
6	March 15	Student presentations	
7	March 22	Student presentations	
8	March 29	Student presentations	
9	April 5	Student presentations	
10	April 12	Student presentations	

11	April 19	Student presentations	
12 13	May 3 May 10	Student presentations Student presentations	
14	May 17	Student presentation and planning for student follow-up	Scientific abstract or one page précis of planned project due
15	May 24	Wrap up session	

Health Policy and Management Specialization Competencies	Course Learning Objectives	Sessions
This course will help you achieve increased competency in health policy and management. By the time you graduate, you should be able to:	After successfully completing this course, you are expected to be able to:	Competencies and learning objectives will be addressed as part of the following course sessions:
1. Describe the role of social, political, biological, economic, historical, behavioral and environmental factors in health and disease in urban settings and identify opportunities for interventions to improve population health at individual, community, city and policy levels	To critique and design studies investigating these factors	All
2. Explain the mechanisms and pathways by which urban conditions affect health and the roles of various urban systems in promoting health and preventing disease	To critique and design studies investingating these mechanisms and pathways	All
3. Explain the value and limitations of multi-level, ecological models in the study of urban health and apply such models to the investigation of specific health problems	Examples of multilevel models will be reviewed and critiqued	One or two sessions, depending on student presentations and interests
4. Apply concepts, theories and methods from two or more disciplines to the study of urban health	Understand analysis of large databases . Understand how insights from qualitative research and/or public health practice can be explored quantitatively	All
5. Design etiological intervention or policy research studies that contribute to new knowledge about urban health	Critique and design policy research studies	All
6. Select methods and theories from diverse disciplinary perspectives to apply to the study of urban health and demonstrate a capacity to combine methods and disciplines in order to achieve fuller understanding of urban health issues	Understand and critique biomedical and policy studies, and understand their intersections	All
7. Describe principal historical developments, theories, current intellectual conflicts and research questions within one specialization area (CSH, EPI, EOH or HPM)	Understand historical roots of current health and social policieis	Various sessions, depending on student presentations and interests.
8. Demonstrate familiarity with scientific and professional literature and main scientific questions for at least two current public health issues or populations groups	Familiarize the student with the scientific and professional literature in areas appropriate to the students professional goals and research interests	All session
9. Demonstrate proficiency in each of the following areas and advanced skills in at least two of the following areas: (1) written	Write a research abstract	Last two sessions

Specialization/ Track Competencies	**Course Learning Objectives**	**Most relevant sessions and assignments[1]**
This course will help you to achieve the following track specific competencies, which are expected of Health Policy and Management track DPH graduates	After successfully completing this course, you are expected to be able to:	
1. Contribute to new knowledge about the mechanisms that influence the delivery of health services and public health programs and the development of health policy in urban settings	Critique and design studies to explore these mechanisms	All sesions
2. Develop and manage initiatives to strengthen the functioning of health systems, health care organizations and public health agencies and programs	Critique and design studies to evaluate the effectiveness of health systems and programs	All sessions
3. Develop, advocate for and implement health care and public health policies	Understand the concepts and practice of research based advocacy	All sessions
4. Analyze the impact of health and non-health policies on population health	Critique and design studies to analyze the effects of policies on population health	All sessions
5. Teach students and professionals about the social determinants of health, health interventions health policy, health management and health disparities in urban settings.	Critique and design studies to assess social determinant of health	All sessions

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PUBH 851 -- Public Health Ethics
3 Credits
Spring 2016

Time and location	Thursdays, 6:30 – 8:30
Instructor	Betty Wolder Levin, PhD Professor, Community Health and Social Science CUNY GSPHHP Professor, Health and Nutrition Sciences, Brooklyn College Professor, Public Health, Graduate Center BWLevin@Brooklyn.cuny.edu e-mail is the best way to reach me Please put PUBH 811 at the beginning of the subject line
Office hours	Office Hours: Thursdays, 4:30 – 6:00 DPH Program Office: (212) 817-7986
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance..
Course description	Identification and analysis of ethical problems in public health using principles, concepts, theories and frameworks from bioethics, social justice and human rights. Examination of ways to apply such analyses to the resolution of dilemmas in research, policy and practice. Critical discussion of challenges involved in respecting the rights of individual and the values of culturally diverse communities while applying ethical standards and protecting and improving the health of populations. Meets methodology elective requirement for DPH students.
Course prerequisites	Matriculated student in a doctoral program at the Graduate Center or permission of the Instructor.
Course format	Seminar Course

Required reading and resources	All required readings will be posted on Blackboard
Suggested reading and resources	Some optional readings and other learning resources will also be posted on Blackboard

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Understand the ethical dilemmas posed by many public health issues and apply the highest ethical standards to their own public health research and practice	• Analyze ethical issues posed by dilemmas and multiple public health disciplines • Discuss ethical issues encounter in their own public health work and their resolution	• Class discussions • Discussion posts • Reflection papers
2. Describe the role of social, political, biological, economic, historical, behavioral and environmental factors in health and disease in urban settings and identify opportunities for interventions to improve population health at individual, community, city and policy levels	• Identify factors affecting the presentation of ethical issues from multiple perspectives • Propose interventions to resolve dilemmas at multiple levels	• Class discussion and/or • Reflection papers and/or • Term paper
3. Apply concepts, theories and methods from two or more disciplines to the study of urban health	• Apply concepts and frameworks from bioethics to the resolution of public dilemmas • Apply concepts and frameworks from human rights to the resolution of public health dilemmas	• Class discussion and/or • Reflection papers and/or • Term paper

Course Assessments

All students in the class will be expected to participate actively in class discussions and contribute at least 5 posts to the discussion boards. Each student will write 2 reflection papers of at least 3 pages discussing course readings, which may be supplemented with other material. At least one reflection paper should address issues in your area of public health work. Each student will also write a 12 – 20 page seminar paper presenting an in-depth analysis of an ethical issue in public health. More information on the assessments and evaluation criteria will be posted on Blackboard.

Grading

Evaluation criteria

Will be addressed in assessment descriptions on Blackboard.

The relative weight of each course component is as follows:

Assessment	Weight
Class Participation	25
Discussion posts	5
Reflection Papers	20
Term Paper	50
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

All students are expected to attend regularly and participate actively in the class. If you will not be attending a class, please e-mail the instructor at least an hour before class.

Late/incomplete submission of assignments

Points may be deducted from grades if assignments are not submitted on time.

Make-ups, rewrites, and extra credit

Students will have an opportunity to re-write reflections papers.
All students will submit a term paper topic, a proposal, a first draft and a final draft of their seminar paper.

Expectations of students

All students are expected to engage with the readings and ideas discussed in the class. Of course, all the usual expectations of public health students apply: Respect other students. We will discuss controversial ideas – please feel free to critique ideas but do not insult others. Please keep material discussed in class confidential unless the speaker agrees to discussion in other setting. No cell phones (except in emergencies); computer work only for class related work during class sessions, etc.

Expectations for the instructor

Provide relevant readings and assignments, conduct classes to promote discussion, and provide individual attention to the work of each student during class, during office hours and by appointment.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student

Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

The schedule is subject to change throughout the semester. The "Last Updated" Date in the header of the syllabus is meant to reference the current version of the syllabus.

See the current academic calendar for important dates (for example: holidays, course drop, course withdrawal). http://www.cuny.edu/academics/calendars/spring-2016.html

#	date	Topic	Assigned Readings	Assessments due
1	2/4	Introduction to course		
2	2/11	Introduction to Public Health Ethics	See list below	
3	2/18	"	"	
4	2/25	Bioethics	"	
5	3/3	Social Justice	"	
6	3/10	Human Rights	"	
7	3/17	Student Paper Proposals -- discussion	Read other student papers	Paper Description
8	3/24	TBD	TBD	
9	3/31	TBD (one of these will be public health research ethics)	TBD	1st Reflection paper
10	4/7	TBD	TBD	
11	4/14	Discussion of Student Prposals	Read proposals	Paper Proposal
12	4/21	Guest: Lynn Roberts – Practicing Social Justice	"	2nd Reflection
	4/28	SPRING RECESS	"	
13 - 15	5/5 5/12 5/19	Final presentations -- student papers	Read other student papers	Draft of Paper Final Term Paper

See list of assigned and optional readings on the following pages. All readings, or links for the readings, are posted on Blackboard.

INTRODUCTION TO THE STUDY OF PUBLIC HEALTH ETHICS

Thomas JC. Public health ethics. Chap. 7 in Scutchfield FW. Keck CW. *Principles of Public Health Practice*: Clifton Park, NY: Delmar Cengage Learning; 2009.

Bernheim RG, Childress, JF, Bonnie RJ, Melnick AL. *Essentials of Public Health Ethics*. Burlington, MA:Jones & Bartlett; 2015.

Chap. 1 Bernheim RG, Childress JF. Introduction: A Framework for Public Health Ethics

Chap. 2 Childress JF Moral Considerations: Bases and Limits for Public Health Interventions

Optional addition reading to introduce the study of public health ethics

Faden R, Shebaya S. "Public Health Ethics", *The Stanford Encyclopedia of Philosophy* (Spring 2015 Edition), Edward N. Zalta (ed.), http://plato.stanford.edu/archives/spr2015/entries/publichealth-ethics

INTRODUCTION TO BIOETHICS AND PUBLIC HEALTH

Callahan D. Bioethics. *In Encyclopedia of Bioethics*, 3rd. ed. Post SG (Ed). New York:Macmillan Reference; 2014: 278-286.

Ethics and Public Health: Model Curriculum. Jennings B, Kahn J, Mastroianni A, Parker LS. Published in electronic format on the Association of Schools of Public Health, 2003. *http://www.aspph.org/wp-content/uploads/2014/02/EthicsCurriculum.pdf*

Lee LM. Public health ethics theory: review and path to convergence. *J Law Med Ethics*. 2012;85-98. Also reprinted in Vol. 34(1), 2012, *Public Health Reviews,* http:// http://www.publichealthreviews.eu/

(Other articles that might be of interest in the same issue of *Public Health Reviews* 34(1) include articles on the STD research Guatemalan prisons, harm reduction, health promotion, and rationing medical care in US and Europe.

Jennings B. Foundations in Public Health Ethics. *In International Encyclopedia of Public Health*, (Vol. 2, Ed.) Heggenhougen K and Quah S. Oxford, United Kingdom: Academic Press; 2008: 660-669.

Optional additional readings on public health ethics

Kass, NE. An ethics framework for public health. *American Journal of Public Health.* 2001;91: 1776-1782.

Public Health Leadership Society. *Principles of the Ethical Practice of Public Health, 2002*. Retrieved March 15, 2009 from:http://www.apha.org/NR/rdonlyres/1CED3CEA-287E-4185-9CBD-BD405FC60856/0/ethicsbrochure.pdf

Kenny OP, Sherwin SB, Baylis FE. Re-visioning Public Health Ethics: A Relational Perspective. *Can J Public Health* 2010;101(1):9-11.

Baum NM, Gollust SE, Goold SD, Jacobson PD Ethical Issues in Public Health Practice in Michigan. *American Journal of Public Health* 2009; 99:369–374.

Levin BW, Fleischman AR. Public health and bioethics – Benefits of collaboration. *American Journal of Public Health.* 2002; 92:165-167.

Daniel C, Jennings B. Ethics and public health: Forging a strong relationship. *American Journal of Public Health* 2002; *92(2)*;169-176.

SOCIAL JUSTICE

Krieger N, Birn AE. A vision of social justice as the foundation of public health: Commemorating 150 years of the spirit of 1848. *American Journal of Public Health*. 1998;88(11):1603-6.

Kreiger N. Public health, embodied history and social justice: Looking forward. *International Journal of Health Services 2015;45(4);587-600.*

Faden R, Shebaya S. Public Health Ethics.*The Stanford Encyclopedia of Philosophy (Summer 2010 Edition)*, Zalta EN (ed.). http://plato.stanford.edu/archives/sum2010/entries/publichealth-ethics/ Accessed Feb. 1, 2016.

Horn L. Powers and Faden's theory of social justice applied to the problem of foetal alcohol syndrome in South Africa. *Public Health Ethics;* 2013;6(1):3-10.

Optional social justice readings

Gostin LO, Powers M. What does social justice require for the public's health. Public Health ethics and policy imperatives: social justice demands more than fair distribution of resources in extreme public health emergencies. *Health Affairs*. 2006;25(4): 1053-1060.

Powers, M. and Faden, R. *Social justice: the moral foundations of public health and health policy*. New York: Oxford; 2006.
Chap. 1: The job of justice
Chap. 2 Justice and well-being
Chap 4 Social justice and public health

Powers M, Faden R. Inequalities in health, inequalities in health care: Four generations of discussion about justice and cost-effectiveness analysis. *Kennedy Institute of Ethics Journal 2000;10(*2):109-127.

Rhodes R. Resource Allocation: Justice and Resource Allocation in Public Health. *International Encyclopedia of Public Health*, *2008*:*544-551*

Healton C, Nelson K. Reversal of misfortune: Viewing tobacco as a social justice issue. *American Journal of Public Health* 2004: 94(2):186-9.

Braverman P, Gruskin, S. Defining equity in health. *J Epidemiol Community Health 2003;57:* 254-258.

Pellow DN. Environmental inequality formation: Toward a theory of environmental injustice. *The American Behavioral Scientist 2000;43:*81-601.

Gil DG. Reflections on health and social justice. *Contemporary Justice Review* pp.2006; 9:39 - 46.

READINGS ON HUMAN RIGHTS

Gruskin S, Mills EJ, Tarantola D. History, principles, and practice of health and human rights. *The Lancet*, 2007; 370(9585): 449-455.

Nickel, J. Human Rights, *The Stanford Encyclopedia of Philosophy* (Feb., 2003; substantive revision Nov. 2014). EN Zalta (ed.) http://plato.stanford.edu/entries/rights-human/

Macnaughton G. Human rights impact assessment: A method for healthy policy making. *Health and Human Rights* 2015;17(1):63-75.

Shannon KL, Kimm BF, McKenzie SE, Lawrence, RS. Food system policy, public health, and human rights in the United States. *Annu. Rev. Public Health* 2015;36:151-173.

Van Esterik P. 1999. Right to food: right to feed; right to be fed. The intersection of women's rights and the right to food. *Agriculture and Human Values 16: 225–2 32. Feminist perspectives on rights*

Optional health and human rights readings 2016

Gruskin, S. Plafker K. Smith-Estelle, A. 2001. Understanding and Responding to Youth Substance Use: The Contribution of a Health and Human Rights Framework. *American Journal of Public Health*;91:1954–1963.

Meier BM, Brugh KN, Halima Y. 2012. Conceptualizing a Human Right to Prevention in Global HIV/AIDS Policy. *Public Health Ethics; 5*(3):263–282

3-14-16

Here are a set of excellent articles from the first issues of the journal, *Health and Human Rights*, when Paul Farmer became editor (2008, vol. 10, issue. 1) by Farmer, Yamin, Hunt and Backman, De Nergri Filho, Meguid, and Lanny and Smith 2008.

Venkatapuram, S., Bell, R., and Marmot, M., (2010). The right to sutures: Social epidemiology, human rights, and social justice. *Health and Human Rights 12(2*).

Chapman, A.R. (2010). The social determinants of health, health equity, and human rights. *Health and Human Rights* 12(2), pp

CUNY SCHOOL OF PUBLIC HEALTH

Graduate Center
PUBH870 – Maternal, Child, Reproductive and Sexual Health in Context
3 credits
Spring 2016

Catalogue description	A critical overview of public health issues, approaches and concerns in the area of Maternal, Child, Reproductive and Sexual Health. Topics will include the medicalization of maternity care and infancy/childhood; the consequences of 'risk' as a dominant ideology for Maternal, Child, Reproductive and Sexual Health care; issues in reproductive justice, with particular attention to race and class, and the historic and contemporary influence of eugenics in public health; the history of midwifery and global trends in midwifery care; and the role of public health interventions in infant care; sexual health and gender identity.
Course meets	Wednesday, 6:30 – 8:30
Pre-Reqs	N/A
Instructor	Barbara Katz Rothman, Ph.D.
Email	BKatzRothman@gc.cuny.edu
Phone	212 817 8796
Office	GC rm 6421
Office hours	Before or after class, or by appt
Required books	Required readings listed in course schedule below
Recommended books	Recommended readings listed in course schedule below
Reserve material	distributed to class members

Other required materials

Assessment
Your understanding of the course material will be evaluated through a paper, due at the end of the semester, on one clearly defined topic in maternal and child health, in consultation with the class and professor. In this paper, you will compare and contrast the presentation of that topic in the Public Health literature with its presentation in popular media, including as the student so chooses, print and on-line sources. Students will consult in groups as panels, but each will do his/her own individual paper and presentation.

Grading

%	
%	
75 %	Term project
25 %	Class participation
%	
%	
%	
%	
100%	

Graduate Center Grade Policy:
A (plus or minus) - Excellent
B (plus or minus) - Good
C (plus or minus) - Fair (lowest passing mark)
F - Failure
W - Withdrew without academic penalty. This is a student-initiated grade, which may be requested from the 4th through the 10th week of the semester. Under no circumstances can a student withdraw and receive a "W" grade after the 10th week of the semester without the written permission of the course instructor and the Executive Officer, and the approval of the Vice President for Student Affairs. This grade carries tuition liability.

Course policies:

Attendance and class participation
Students are expected to attend *every* class session and complete the readings *prior to* each of the class sessions so as to be able to participate fully during the class. The instructors should be notified by email or voicemail if an absence is unavoidable; excessive lateness may be considered equivalent to absence from class. It is the student's responsibility to obtain missed class notes and related information from a colleague. Assignments must be received by the due dates regardless of class attendance.

Lateness and absences

Late submission of assignments
Assignments are due on the date indicated in this syllabus. A *full grade* will be deducted for each week an assignment is late. In case of emergency, please contact the instructor. Incomplete final grades for this course will NOT be granted unless the request is justified by a legitimate and documented emergency.

Class citizenship & rules of conduct
Cellphones and other electronic devices
Use of any electronic devices in class must be limited to accessing the course materials under discussion in that session and taking notes. Under no circumstances should these devices be used for communication with others *within or outside of the classroom*. Students are expected to be

fully engaged with and participating in the class; thus, use of any devices that distract the student(s), instructor(s), and/or guest(s) will be considered intrusive and in violation of expected standards of conduct in the classroom. As such, the student may be asked to discontinue use of the device.

Email correspondence
The instructors will try to respond to emails within a 24-hour period during the standard Monday through Friday work week. Students should not wait until a Friday to send an email if a response is needed before the following Monday. The instructors may respond over the weekend but it is not guaranteed. Responses that take more than a day during the work week may be due to special circumstances, such as the instructor is attending an out-of-town conference, the student's query is of a complex nature that requires consultation with others/obtaining additional information, etc.

Institutional policies:

Accessibility
Among other responsibilities, the CUNY Graduate Center Vice President for Student Affairs has overall responsibility for Student Disability Services and is the 504/ADA Coordinator.

Contact information:
Matthew G. Schoengood, Vice President for Student Affairs, Rm: 7301, Telephone: 212-817-7400
Email: studentaffairs@gc.cuny.edu

Academic integrity
The Graduate Center outlines a clear definition of Academic Honesty and the DPH program expects students to know and follow the CUNY Academic Integrity Policy. Both can be found in the GC Student Handbook as well as a link to the GC Avoiding and Detecting Plagiarism guide. http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf

Help with research and writing
Librarians at the CUNY GC Mina Rees Library are available to help students with using research databases and citation software in person or remotely by phone, chat or email. Contact information can be found on the library's research website at: http://library.gc.cuny.edu/research-help/

The GC Wellness Center provides academic consultation services to help keep students on track with their academic work by working on the obstacles to progress and developing strategies to overcome them. More information can be found on the GC Wellness Center's website at: http://www.gc.cuny.edu/Prospective-Current-Students/Student-Life/Health-Wellness/Counseling-Services/Academic-Health

Last day to drop the course with the grade of "W": April 16, 2016

http://www.gc.cuny.edu/Public-Programming/Calendar/Academic-Calendar-2014-15?page=2

Grade of Incomplete (INC) and Graduate Center Policies

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergency. Only students averaging a C or above in the course are eligible to request an incomplete course grade.

According to Graduate Center policy updated 7/11/2011, to resolve incomplete grades, students must fulfill their obligations within one calendar year after the INC grade is assigned. After one year, an incomplete grade (''INC'') will become a permanent incomplete. Extensions will be granted only in exceptional circumstances upon written application and with the permission of the faculty member, the Executive Officer, and the Vice President for Student Affairs. Permanent incompletes will accrue no credit. Students with more than two incomplete courses will be brought to the attention of their Executive Officer to determine whether or not they are making satisfactory progress. Students will not normally be regarded as making satisfactory progress toward their degrees if they have more than two "INC"s on their records. Students should be aware that continued registration and most financial aid awards are conditional upon satisfactory progress. Students should also note that credits for which they have an "INC" as of the end of the third week of classes of a given semester are not counted toward advancement to the next level for that semester.

Grade appeals

The doctoral faculty as a whole and, more specifically, the faculty of a doctoral program are responsible for determining the requirements and standards of performance for courses and for qualifying examinations. A course instructor retains considerable discretion in these matters. The instructor is under obligation, however, to ensure that the course syllabus is consonant with the goals of the curriculum of the degree program. The expected level of performance in a given course shall reflect levels of difficulty relevant to the educational objective of the program. In addition, the instructor has an obligation to students to make clear the basis of evaluation (e.g., reading assignments, papers, contributions to seminar discussions, experimental work) at the start of each course so that students are not surprised by unexpected or untimely demands. Grades on examinations or for work in a course are the responsibility of the instructor. Specific information pertaining to the procedures for an official grade appeal through the GC can be found in the GC student handbook at: http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf

Schedule (suggested format)

Session	Date	Topic	Readings and Assignments
1	2/3	Introductions Maternal and Child health in context part 1, From Medicalization to Risk	"Medicine as an Institution of Social Control," The Sociological Review, Volume20 # 4, 1972, pp 487-504 http://onlinelibrary.wiley.com/doi/10.1111/j.1467-954X.1972.tb00220.x/pdf excerpts from: Petersen and Lupton, THE NEW PUBLIC HEALTH, 1996, 2000 reprint, excerpts from Elizabeth M. Armstrong, CONCEIVING RISK, BEARING RESPONSIBILTY, 2003 Philip Alcabes, "What Ails Public Health?" CHRONICLE OF HIGHER EDUCATION, November 9, 2007 **Intellectual autobiography due next week**
2	2/10	Maternal and Child Health in context part II: Eugenics Movements, historical and contemporary	excerpt from Wendy Kline, BUILDING A BETTER RACE: GENDER, SEXUALITY AND EUGENICS FRM THE TURN OF THE CENTURY TO THE BABY BOOM, U Calif press, 2001 excerpts from BKR, THE TENTATIVE PREGNANCY; and from THE BOOK OF LIFE excerpts from Margaret Sanger's writings Allan Rosenfield, 1985 "Maternal mortality—a neglected tragedy. Where is the M in MCH?" Lancet. (8446):83-5. "Historic Foundation of Maternal and Child Health" from Koch, editor, 2005.
3	2/17	American maternity care: historical perspectives	excerpts from Jaqueline Wolf, DELIVER ME FROM PAIN excerpts from BKR, IN LABOR; LABORING ON Film, inhttp://www.snagfilms.com/films/title/all_my_babies_a_midwifes_own_story[snagfilms.com] https://www.youtube.com/watch?v=28kp021OuiY[youtube.com]
4	3/2	International issues in childbirth: From the EU ruling on home birth to under-resourced settings *Readings:*	selected proceedings, HUMAN RIGHTS IN CHILDBIRTH, conference, June 2012, The Hague Unicef statement of goals on reducing maternal mortality: http://www.unicef.org/mdg/maternal.html Mavalankal and Rosenfield, Maternal Mortality in Resource-Poor Settings: Policy Barriers to Care, Am J Public Health. 2005 February; 95(2): 200–203. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449152/ and a film about midwives learning to do cesarean sections: http://www.pbs.org/wnet/wideangle/episodes/birth-of-a-surgeon/introduction/747/ Second hour, guest, Professor Lynn Roberts, Reproductive Justice in the United States, readings to be distributed.
5	3/9	Issues in	Readings include: Excerpts from Carol Joffe, Dispatches from the

		Abortion, contraception and sexuality.	Abortion Wars; Additional readings to be distributed
6	3/16	Guest: National Advocates for Pregnant Women	Guest, NAPW Farah Diaz-Tello Readings to be distributed
8	3/30	Prenatal and Newborn Screening	Excerpts from BKR, *The Book of Life* Excerpts from BKR, *The Tentative Pregnancy* Excerpts from Rachel Grob, *Testing Baby* Excerpts from Timmermans and Buchbinder, *Saving Babies? The Consequences of newborn Genetic Screening,* Guest, Prof Gareth Thomas, Cardiff University, Wales, additional readings to be distributed.
9	4/6	Topic open.	Topic open, to be determined with class
10	4/13	Topic open	Topic open, to be determined with class
11	4/20	**Issues in Breast Feeding and Infant Care**,	Readings include: Excerpts of Jacqueline H. Wolf, *Don't Kill Your Baby: Public Health and the Decline of Breastfeeding in the 19th and 20th Centuries* (Ohio State University Press, 2001 Excerpts, Barbara Katz Rothman, Laboring On Lakshmi Menon and Sarah Amin, BREASTFEEDING: A REPRODUCTIVE HEALTH AND RIGHTS ISSUE, World Allliance for Breastfeeding Action, 2005 Guests: Professors Martine Hackett and Tracy Chu, on infant sleep research; readings to be distributed
12	5/4	**Issues of Disability: Mothers at Risk**	Cheryl G Najarian, Deaf Mothers, Maternal Thinking and Intersections of Gender and Ability, paper presented Eastern Sociological Society, 2006 Aunos, M., Goupil, G., & Feldman, M. (2003). Mothers with intellectual disabilities who do or do not have custody of their children. *Journal on Developmental Disabilities, 10*(2), 65-79. http://www.oadd.org/publications/journal/issues/vol10no2/download/aunos.pdf Center for Reproductive Rights. (2002, January). *Briefing report: Reproductive rights and women with disabilities: A human rights framework.* http://www.crlp.org/pdf/pub_bp_disabilities.pdf Corbett, Joan O'Toole**, Sex, Disability And Motherhood: Access To Sexuality For Disabled Mothers. Disability Studies quarterly. 2002.** http://dsq-sds.org/article/view/374/495 Guest, Gay Wilgus, on mothers of disabled children
13	5/6/	Topic	To be decided with class

	15	Open	
14	5/11	Wrap-up, unfinished business, final discussions	Wrap-up, unfinished business, final discussions
15	5/18	Wrap-up, unfinished business, final discussions	Wrap-up, unfinished business, final discussions

Community, Society and Health Specialization Competencies	Assessment Methods
This course will help you achieve increased competency in community, society and health. By the time you graduate, you should be able to:	Competencies and learning objectives will be evaluated as part of the following assessment methods:
Describe the historical development of public health work in maternal, child, reproductive and sexual health	Term project and class participation
Analyze the role of race and racism in maternal, child, reproductive and sexual health, and understand the difference between a reproductive choice and a reproductive justice approach.	Term project and class participation
Identify the major economic, political, environmental and social forces that influence maternal and infant morbidity and mortality, and sexual health.	Term project and class participation
Identify and understand life course theory and use its concepts to explain differences in health and illness as it relates to maternal, child, reproductive and sexual health.	Term project and class participation
Describe the elements of the life course theory that apply to disparities in health outcomes.	Term project and class participation
Identify major economic, political, and environmental forces that shape the health of U.S. populations.	Term project and class participation

CUNY GRADUATE SCHOOL OF PUBLIC HEALTH AND HEALTH POLICY

COURSE SYLLABUS

PUBH 89100_23327 (GC)
Advanced Research Seminar II
3 Credits
Last Updated: February 8, 2016
Spring 2016

Time and location	Graduate Center, Room 5382, Mondays, 4:15-6:15 pm
Instructor	Nicholas Freudenberg, Dr.PH Community Health and Social Sciences Distinguished Professor of Public Health Nick.freudenberg@sph.cuny.edu Silberman and 125th Street 212-396-7738 Sandra E. Echeverria, PhD, MPH Associate Professor Community Health and Social Sciences Sandra.Echeverria@hunter.cuny.edu (best way to reach me) Silberman Room 529 (212) 396-7740
Office hours	By apppointmnet
Course website	https://bbhosted.cuny.edu
Support resources	For technical assistance, contact the Helpdesk. Academic support services and writing skills assistance are available.
Course description	Guides advanced students in the completion of their dissertation proposal and, if needed, Institutional Review Board (IRB) application for dissertation research. Faculty assist students to refine the research design, to fully develop appropriate research methods and analytic strategies and to provide protection for human subjects in their dissertation research.
Course prerequisites	All coursework; Successful defense of the Second Exam
Course format	Seminar/ lecture
Required reading and resources	Kuhn, Thomas. *The Structure of Scientific Revolutions.* U of Chicago Press. 2012 (4th edition); Materials posted via Blackboard
Suggested reading and resources	, 2 Dissertations in the student's subject or methods area

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*After successfully completing this course, you are expected to be able to:*	*Competencies and learning objectives will be assessed as part of the following course assignments:*
1. Assess the mechanisms and pathways by which factors influence individual and population health.	• Describe specific research questions to be answered in the proposal;	• Participation in class discussions based on assignments
2. Design and conduct etiological, intervention, policy, implementation science and other empirical studies that contribute to new knowledge about population health	• Define Specific Aims	• Oral presentations
3. Synthesize and apply methods, theories and data from multiple disciplines to understand and solve population health issues	• Engage faculty in a dissertation committee	• Written assignments
Generate, translate, communicate, and disseminate population health evidence to diverse audiences	• Identify data sources and explain methods proposed to answer these questions;	• Final draft dissertation proposal
3. Implement professional and organizational ethical guidelines in population health research and practice.	• Assess the strengths and weaknesses of these methods	• Oral presentations
Secure resources to conduct population health research and practice	• Describe obstacles likely to be encountered in a dissertation project and propose strategies to overcome these obstacles;	• Final draft dissertation proposal
	• Prepare a written draft dissertation proposal and present orally.	• Final draft dissertation proposal

Course Assessments

Participation in class discussion based on assignments (This includes written assignments throughout the semester)	30%
Complete draft dissertation proposal	70%.

Grading

Evaluation criteria

The relative weight of each course component is as follows:

Assessment	Weight
Class Participation	15%
Attendance at GC Seminars	15%
Completed Dissertation Proposal (including drafts of sections)	70%
	100%

The grading system for the course follows guidance in the Graduate Bulletin.

Letter Grade	Quality Point Value	Percentage
A+	4.00	100-98
A	4.00	97-93
A-	3.70	92-90
B+	3.30	89-88
B	3.00	87-83
B-	2.70	82-80
C+	2.30	79-78
C	2.00	77-73
C-	1.70	72-70
F	0.00	<70

Withdrawal

If an emergency arises, the student must immediately notify the instructor and agree upon a course of action, especially if the student is unable to complete the course. Students are permitted to officially withdraw from courses without academic penalty generally up until the 10th week of class. The specific policies and dates for course withdrawal are available online.

Grade of incomplete

Incomplete final grades will not be granted unless the request is justified by legitimate and documented emergencies. The granting of an incomplete grade is at the discretion of the instructor. Refer to the Student Handbook for further details.

Grade appeals

When a student considers a final course grade unsatisfactory, the student should first confer with the instructor. If the student is still not satisfied, the student should promptly

contact the Executive Officer of the DPH program in writing giving the factual reasons and basis for the complaint. Details about the academic appeals procedures can be found in the Student Handbook.

Course Policies

Attendance and class participation

Attendance and class participation are required. Expect to actively contribute to the discussion and complete and submit all assignments by posted due dates. Missed assignments or lack of discussion participation not only affect the individual student, but they also affect the class as a whole due to the high degree of interaction within the course.

Late/incomplete submission of assignments

Acceptance of late/incomplete assignments due to unavoidable delays in research progress must be pre-approved by the instructor.

Make-ups, rewrites, and extra credit

The nature of this seminar requires numerous rewrites as the student progresses toward a defendable proposal, with full committee engagement.

Additional Graduate Center Policy on INC Grades

To resolve incomplete grades, students must fulfill their obligations within one calendar year after completion of the course. After one year, an incomplete ("INC") will automatically be transformed into an "INP'' (permanent incomplete); extensions will be granted only in exceptional circumstances upon written application and with the permission of the faculty member, the Executive Officer, and the Vice President for Student Affairs. Permanent incompletes will accrue no credit. Incomplete grades cannot be changed to letter grades after a student has been advanced to candidacy and has been moved to Level III.

Students with more than two incomplete courses will be brought to the attention of their Executive Officer to determine whether or not they are making satisfactory progress. Students will not normally be regarded as making satisfactory progress toward their degrees if they have more than two INCs on their records. (Please refer to "Standards for Retention," below, and to page 63 of this handbook.) Students should be aware that continued registration and most financial aid awards are conditional upon satisfactory progress. Students should also note that credits for which they have an INC as of the end of the third week of classes of a given semester are not counted toward advancement to the next level for that semester.

Expectations of students

- Be familiar with Graduate Center and DPH program requirements including but not limited to policies regarding academic standing, academic integrity, grading, and academic calendar.
- Know how to use GC library resources, including dissertation searches, and citation managers
- Show respect to everyone in the course.
- Be fully prepared to actively participate in discussion.
- Complete all assignments by their assigned due date.
- No credit for assignments suspected of plagiarism or cheating.
- Be held accountable for all material assigned/covered in the course.
- Regularly check Blackboard and official university email for course correspondence.
- Questions dealing with the course (course content, assignments) may be generally relevant to others in the class and can be posted in the discussion board.
- Contact the professor directly with personal questions and concerns related to the course.
- When in doubt, ask questions and clarify course assignments and expectations.
- Develop and maintain contact with dissertation committee sponsor – and individual committee members as advised by sponsor.

Expectations for the instructor

- Provide regular announcements, reminders, and suggestions on the course website
- Monitor, ask follow-up questions, and answer questions presented during discussion
- Respond to student email within 48 hours Monday through Friday.
- Grading and feedback on assignments within 1 week of the due date.
- Individual sessions with the instructor to overcome perceived barriers to dissertation proposal progress
- Communication about course progress given through the course website.

Accessibility

Support services and accommodations are available to provide students with disabilities greater accessibility to the academic environment. The Vice President for Student Affairs is the 504/ADA Coordinator (Room 7301; 817-7400). For more information (with confidentiality) contact Sharon Lerner or Elise Perram (212-817-7400 or disabilityservices@gc.cuny.edu).

Academic integrity

CUNY regards acts of academic dishonesty (e.g. plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty according to established procedures. Refer to the CUNY Policy on Academic Integrity, the Graduate Center Guide, and other sources for definitions and examples of academic dishonesty.

Course Schedule

Session	Date	Topic	Readings and Assignments
1	Feb 1	Introductions and Course Overview	None
2	Feb 8	Overview of NIH grant components and Specific Aims Students brief presentation of their topic (10 minutes)	Lecture: Echeverria/ Freudenberg In Class: Review and critique students' specific aims page **Readings**: 1-page Specific Aims of each class member
	Feb 15	**NO CLASS- President's Day**	
3	Feb 22	**DPH Grand Rounds**	S. Bertozzi, MD, PhD. Using Bigger Data Better to Improve Population Health
4	Feb 29	Scientific Inquiry and the Development of Conceptual Models and Study Questions	Lecture: Echeverria In Class: Critique Summary of strengths and limitations of similar dissertations - organization, clarity of aims, contribution to existing literature, linking conceptual framework to analytic approach **Readings: Kuhn; 2 dissertation proposals with similar topic (Pro Quest)**
5	Mar 7	Life Course Concepts and Models	Guest Lecture: Teresa Janevic, PhD, MPH In Class: Critical discussion of topic **Readings: See Blackboard**
6	Mar 14	Conceptual and analytic approaches to change over time	Lecture: Echeverria In Class: Critical discussion of topic **Readings: See Blackboard**
7	Mar 21	Use of administrative datasets: Strengths and limitations	Guest Lecture: TBD In Class: Critical discussion of topic **Readings: See Blackboard**

8	Mar 28	Revised Specific Aims Discuss Methods Issues of Student Proposals	Lecture: Students present for 15 minutes In Class: Critical review of student work **DUE: Revised Specific Aims**
9	Apr 4	**DPH Grand Rounds**	Ronald Labonté, PhD, FCAHS, HonFFPH. Topic TBD.
10	Apr 11	Integrating quantitative and qualitative approaches in public health research	Lecture: Echeverria/ Freudenberg In Class: Critical discussion of Methods for Dissertation **Readings: See Blackboard**
11	Apr 18	Dissertation Proposal	Lecture: Students Present All Components of Dissertation Proposal (15 min) ***DUE: Full Draft of Dissertation Proposal***
	Apr 25	**SPRING BREAK- NO CLASS**	
12	May 2	Meet with faculty 1-on-1	Discuss comments/ gaps for final draft
13	May 9	**DPH GRAND ROUNDS**	Speaker and Topic TBD
14	May 16	Student Presentations	Final presentation of Dissertation proposal and timeline for defense (30 minutes each)
15	May 23	Student Presentations/ Course Wrap Up (Cont'd- last day of course)	Final presentation of Dissertation proposal and timeline for defense (30 minutes each)

PASS

Name:

Degree/Program: MPH with concentration in Epidemiology & Biostatistics

Fieldwork Organization: The Dave Nee Foundation

Address: P.O. Box 231487, New York, NY 10023

Purpose: To conduct research and data analysis relevant to the organization's needs.

Preceptor: Rachael Barrett, MBA (with Katherine Bender, PhD as data analysis supervisor)

Dates: February–December 2015

Reflection Summary:

My completed coursework at the CUNY School of Public Health provided a good foundation upon which my fieldwork experience was built. As with most jobs, this fieldwork placement required interpersonal and organizational skills on one hand and technical skills on the other. With regard to the former, the fieldwork called for a great deal of organizational ability, good communication skills, and knowledge of how to work well independently while contributing to a collective work product. Technical skills that I drew upon in completing this placement included working with computers and databases, and ability to conduct statistical analysis.

My responsibilities as an intern at the Dave Nee Foundation included researching information on similar nonprofits throughout the nation; entering, analyzing, and reporting on data pertaining to the organization's Uncommon Counsel program; and conducting a preliminary analysis of data from the Survey of Law Student Wellbeing. Nonprofit research involved use of the Internet to identify organizations working in the field of suicide prevention, documenting information about these organizations in a database, and contacting organizations electronically

and/or by phone to obtain missing information. For Uncommon Counsel, a mental health educational program aimed at law students and members of the legal community, I entered data from feedback forms completed by attendees into SPSS, ran statistics using the data, and helped prepare reports explaining our findings to school administrators, an audience not always familiar with statistical analysis. I closely examined and ran preliminary statistics using data from the Survey of Law Student Wellbeing (SLSW), stored in SPSS format as well. With the consent of Dr. Bender and the study principal investigators, I plan to submit an abstract to the 2016 New York City Epidemiology Forum and write my master's essay using these data.

I received adequate supervision as part of my fieldwork. Both Ms. Barrett and Dr. Bender were responsive to any questions I had, and most of our communication took place via email and phone. Of the two, Dr. Bender provided me with more feedback, encouraging me occasionally to make suggestions as to a better way a particular task should be handled. This made me feel that my opinion was valued. Because all paid and unpaid employees of the organization work remotely, there was less communication and supervision then there would have been in an organization with a physical office. I did not view it as problematic, however, because I am good at independent work.

I encountered several obstacles in the course of my fieldwork experience. The biggest obstacle was a lack of time to devote to fieldwork. Because of that, I had to extend the deadline for completing my fieldwork hours several times. In addition, I had hoped to do work on the Healthy Minds study dataset but had to focus on SLSWB instead because one of the Healthy Minds study staff decided to go back to law school and thus had an interest in analyzing and publishing the Healthy Minds data first. Another challenge, which I encountered while working on the Uncommon Counsel component of my fieldwork, was an occasional reluctance of

employees of other nonprofits to give out information that I was looking for. I did my best to address the problem by initiating our communication electronically and then following up via phone, several times if necessary.

Despite these drawbacks, my fieldwork experience was a positive one: it helped further my career and allowed me to gain new skills, knowledge, and experiences. In terms of my career, this fieldwork was the first time I got to work for a mental health nonprofit. It benefitted me academically, allowing me potentially to present and also to use SLSWB data for my master's essay. Given these positives, I made the decision to continue to volunteer with the Foundation after my formal fieldwork period is over. Working for an organization with only two paid employees was a new experience, allowing me to feel I was in my own right a representative of the Foundation while I communicated with the nonprofits I was researching. The fieldwork sharpened both my interpersonal and research skills and let me appreciate the importance of blending both when one works for such a small organization.

The fieldwork placement offered several general lessons and helped identify a few opportunities for improving this experience for other public health students in our school. It helped me see the benefits of considering non-traditional employment opportunities and of hard work and persistence, which were necessary to do well in this placement. To improve the fieldwork experience, I would recommend simplifying directions for students completing fieldwork deliverables by excluding any unnecessary or repetitive information. It is also worth considering allowing students to pursue fieldwork placements that are not completely defined by their specialization, as their previous core and elective courses already train them well in their chosen track of study. I would recommend other students interested in an experience similar to mine to have their fieldwork placement with the Dave Nee Foundation, considering that it is an

organization with a worthy mission and a receptiveness to new ideas and talent.

Reasons for Low Uptake of Pre-exposure Prophylaxis in New York City

PUBH 806; Spring 2015

Abstract

Background: Pre-exposure Prophylaxis (PrEP) has the potential to reduce one's risk of acquiring HIV, and PrEP scale-up is being encouraged locally. Yet, awareness and uptake of the prescription remain low in New York City (NYC).

Methods: To assess reasons for low awareness and uptake of PrEP, three focus groups were conducted with gay men residing in NYC and aged 21-32 years. Transcripts were reviewed to identify themes and coded accordingly.

Results: Seven (7) men participated in focus group discussions. All participants expressed positive attitudes toward the use of PrEP for HIV prevention. I identified five constructs related to reasons for low awareness and uptake: PrEP unaware, shame, low HIV-risk perception, low accessibility of PrEP, and PrEP use concerns. The most common themes were related to shame and stigma surrounding the use of PrEP. Participants expressed that colleges and general practitioners offices would be good venues for marketing PrEP. These five constructs were used to create a framework for increasing the use of PrEP.

Discussion: These data indicate that PrEP implementation programs should consider addressing PrEP-related shame and that student health clinics and college newsletters may be an efficient way to market PrEP to young adults. General practitioners should discuss PrEP with patients at annual visits, especially with patients seeking STD screening. For widespread scale-up of PrEP to be successful, the concerns of potential PrEP users need to be addressed, and the proposed framework could be useful as health departments scale up PrEP programs.

Background

More persons are diagnosed with HIV in New York City (NYC) than in any other United States city (1). In 2013, there were 3,007 NYC residents diagnosed with HIV (1). The majority of new HIV diagnoses were among men who have sex with men (MSM) (57%) and young persons (60% diagnosed <49) (1). Novel HIV prevention methods are needed to control the spread of HIV.

In July of 2012, the Food and Drug Administration approved the first drug for the prevention of HIV infection. When taken once a day, pre-exposure prophylaxis (PrEP) can reduce the risk of HIV infection by 92% (2). Biomedical interventions, such as PrEP, expand the package of services available for the prevention of HIV, and widespread scale up is being encouraged at the federal and local levels (3-4). In the spring of 2014, the New York City (NYC) Health Department conducted surveys at two public sexually transmitted disease clinics with 389 patients at risk for HIV acquisition (5). Nearly 60% of respondents were unaware of PrEP, and none had used PrEP (5). Encouragingly, after learning about PrEP 70% of respondents indicated they were somewhat or very likely to take PrEP (5).

NYC has one of the largest HIV epidemics in the country, and PrEP has the potential to reduce one's risk of acquiring HIV (1-2). Yet, awareness and uptake of the prescription remain low in NYC (5). PrEP is currently indicated for men who have sex with (MSM) at substantial risk for HIV infection based on risky sexual and drug use behaviors (6). The aim of this research was to understand why awareness and uptake of PrEP remain low among young gay men in NYC.

Methods

Data Collection

Three focus groups were conducted to explore the topic of PrEP awareness and uptake in NYC. The focus groups occurred in small group pairs or triads. Focus groups are particularly

useful for attitudinal research, as explaining or accounting for attitudes is easier for people when they hear different perspectives (7). In this case, I was interested in attitudes related to the use of PrEP. Additionally, group dynamics are useful when there is a social context within which a phenomenon is experienced (7), and PrEP is recommended for groups of people based on sexual and injection drug use behaviors.

As a result of the relationship between PrEP use and sexual and drug use behaviors, the topic of PrEP is somewhat sensitive. However, if people have similar experience of the issue, sensitive topics can be explored in-group settings (7). Additionally, it is helpful for there to be some commonality between participants' sociodemographic or other characteristics most relevant to the research topic, which is why the groups were comprised of persons with similar sexual orientation and of age. Small groups pairs were used because they allow for participants to draw comparisons with and hear from others, but they are a more private forum and are particularly useful when participants might feel the subject matter is personal or intimidating (e.g., exploring views of complex public issue such as PrEP).

Commented [DR1]: very good presentation of the methodological considerations in this paragraph

Standard focus group procedures were employed for the collection of data. Before beginning the discussion, the purpose of the project was described to the participants, and select demographic characteristics were recorded via a brief, anonymous questionnaire. The group discussion was moderated, audio-recorded and lasted approximately one hour.

Commented [DR2]: domains/categories in/description of content of FG Topic Guide ?

Recruitment

Purposive sampling methods were used to recruit young gay men residing in New York City. To be eligible for inclusion in the study, a participant needed to identify as gay and male and be 18-35 years of age. I chose to limit recruitment to young gay men because gay men are a priority population for prevention with PrEP (5) and because gay men, in addition to young persons, are disproportionately diagnosed with HIV in NYC. I went with a homogenous sample

approach, as this gives a detailed picture of a process (PrEP awareness and PrEP use) for individuals who belong to the same subculture (7). I recruited participants from my social network and via friends within my social network.

Analytic Plan

Notes taken during the discussion were used to assist with transcription. Transcripts were reviewed to identify important themes and then coded accordingly; themes were further grouped into larger constructs (7). Generally, the group-to-group validation technique guided the reporting out of the focus group results (8). Three factors influenced how much emphasis a given topic received in this report: how many groups mentioned the topic/theme, how many people within each group mentioned the topic, and how much enthusiasm/energy the topic generated among the participants (8). Given the small scale of this project, I also reported out a couple themes that were only mentioned by one group. I did so because I thought the themes deserved to be in the final report, as they brought a unique point of view to the findings. Analyses were conducted in Dedoose.

Commented [DR3]: Recall that 'different' or 'minority view' results are oftentimes as impt in qual research as 'majority views' if they appear to provide a deeper/more complete understanding of the concepts. (This should be referenced.) Also, with your small n, it's possible that these 'lesser' views might actually reach saturation/greater importance if you had a moe appropriate sample size.

Results

Seven persons participated in three focus group discussions. The participants were aged 21-32 years at the time of the focus group. Three of the participants were still in college. Two participants were British, and the remaining five were Americans. Four persons were aware of the existence of PrEP, and none had used PrEP. All participants (N = 7) expressed positive attitudes toward using PrEP for the prevention of HIV. This comment from a 32-year-old, male participant seemed to capture the general feeling: "There's no reason not to allow it [PrEP]… I think since there's something out there [to prevent HIV infection], then it should be encouraged."

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Reasons for low awareness and uptake of PrEP

I identified five constructs related to reasons for low awareness and uptake of PrEP. Table 1 lists the constructs and the themes that were included in each construct and illustrative quotes that were coded in each theme. The first construct was PrEP unaware, which was defined as having minimal knowledge of PrEP at the individual and/or at the community level. This construct was made up of four themes. The first theme was being unaware that PrEP existed on the market. The remaining three themes included in this construct were not necessarily endorsements of being unaware of PrEP; however, they were included because they contributed to a lack of awareness of PrEP. For example, participants talked about how their general practitioners do not discuss PrEP with them at medical appointments.

The second construct was shame and stigma as they relate to HIV and PrEP. This construct was comprised of three themes. The first theme was stigma related to HIV, and the remaining two themes were based on shame related to PrEP. All of the participants expressed concerns of increased risk-taking behavior while taking PrEP. This was explained by one participant as analogous to the Australian experience of "introducing rabbits into Australia, where they are trying to get rid of some pest, and then you've got a problem with rabbits… You have a new problem, maybe sexually transmitted diseases, which aren't seen as bad because - oh it's an infection that you get rid of *with another pill."*

Nearly all the participants expressed that taking a pill to prevent HIV infection says something about you as a person. For example, "They [people considering to take PrEP] might be embarrassed to take it. They would be embarrassed for people to know that they are at-risk."

The third construct was participants expressing they perceived themselves at low-risk for HIV infection, as they were already taking steps to prevent HIV (e.g., condoms or monogamy) or they didn't believe they would get HIV. The fourth and fifth constructs were related to the actual prescription of PrEP: the belief that getting a PrEP prescription would be difficult and

Commented [DR5]: numerals not used for the preceding three constructs

concerns about aspects of using PrEP. The belief that getting a PrEP prescription was difficult was comprised of three themes: 1) financial issues limit access to PrEP; 2) health care providers limit access to PrEP or 3) insurance limits access to medical care. Persons concerned about aspects of PrEP use mentioned either drug safety or adherence concerns.

Table 1. Reasons for low awareness and uptake of PrEP

Construct	Definition	Sub-Themes Contributing to the Construct	Illustrative Example
PrEP Unaware	Minimal knowledge of PrEP at the individual and/or community level	1) Unaware of PrEP	"I've never heard of PrEP"
		2) General practitioners do not discuss PrEP with patients	"The doctors should just talk to you about it. They should just give you information."
		3) Sex education should include information on PrEP*	"As part of sex-ed, [PrEP] should be discussed when you talk about HIV"
		4) PrEP is not marketed in the right way	"Brochures should be available at the general practicioner"
Shame	Concerns about shame and stigma as it relates to HIV infection and to getting a PrEP prescription.	1) HIV as a stigmatized disease	"It's obviously a really horrible thing [HIV]. I wouldn't wish it on anyone."
		2) Concerns of increased risk-taking behaviors while taking PrEP	"Some people see this as 'oh I can be less careful in using condoms' "
		3) Taking a pill to prevent HIV infection says something about you as a person	"If I was sleeping with one person, and I put myself on it. That says something to your partner. You're worried about the relationship"
Low HIV Risk Perception	Belief that he won't get HIV or isn't at risk for infection	1) Already taking precautions to prevent HIV	"I've been in a committed relationship for the past two years"
		2) Doesn't perceive himself to be at-risk for infection	"I don't see myself as being in a situation where I'm likely to be exposed to HIV"
Low Accessibility of PrEP	Belief that getting a PrEP prescription will be difficult	1) Financial issues limit access to PrEP	"As a student, how long can you afford to be buying this monthly?"
		2) Access to PrEP is limited because of issues related to their health care providers	"I imagine my doctor knows about this pill. But I'm not so sure."
		3) Access to medical care may be limited because of insurance**	"And I just got kicked off my parent's health insurance so for me [the major barrier is] insurance."
PrEP Use Concerns	Concerned about aspects of using PrEP	1) Concerned about drug safety of PrEP	"I am worried about putting that [PREP] into my body. It's new"
		2) Concerned about ability to take a pill everyday	"Or if you miss a pill. Adhering is something I would worry about."

*Theme was only mentioned by British participants

**Theme was only mentioned by American students

Differences between British and American participants

Only British participants discussed sex education as a way to increase awareness of PrEP. The two British participants assumed that once the next generation went through sex education that the general population would know about the existence of PrEP. “This is just a problem until the next gen has been taught [about PrEP] in sex ed.” Even after the American participants were probed about ways to increase awareness of PrEP, none mentioned sex education. However, the participants still in college mentioned that student health clinics would be an ideal venue to receive information about PrEP for HIV prevention, and that students regularly receive information from the clinic providers about other risk-behaviors (e.g., drug and alcohol use) that increase their risk for sexually transmitted diseases.

The second difference based on nationality was related to insurance. Only Americans, specifically the college students, expressed that access to medical care may be limited because of insurance. When the British participants were asked if this was related to having the National Health Service, one replied, “Oh. I don’t know. I wouldn’t have thought of it like that. I guess it could be [related to having the NHS]. I do find medical care here [NYC] a bit confusing so I often try see the doc when I’m in London.”

Conceptual model for increasing the use of PrEP

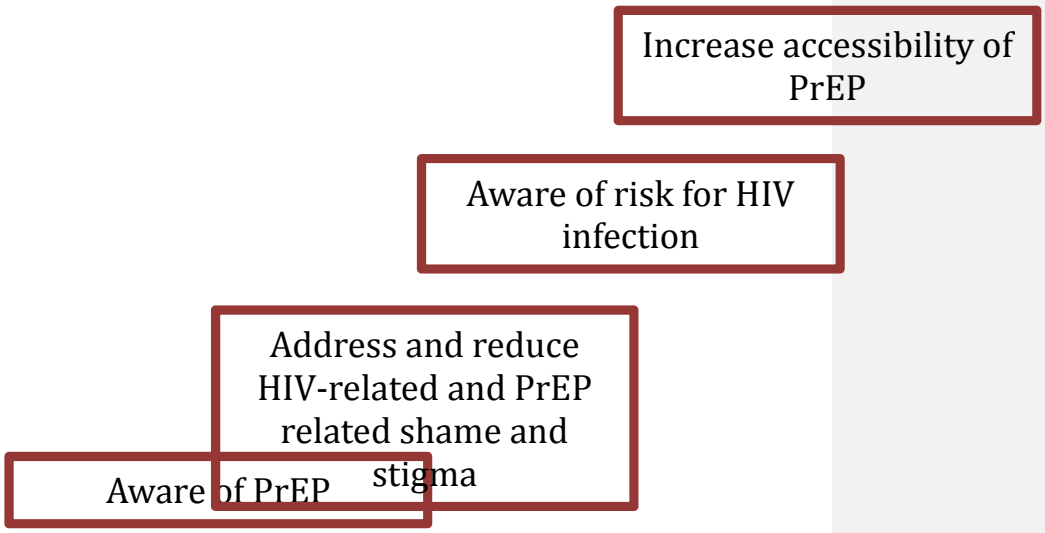
Based on the five constructs, I created a model for increasing the use of PrEP (Figure 1). The Steps to PrEP Use model addresses the barriers mentioned by participants in a sequential series of (?) steps. The idea for sequential steps that limit a person’s access to PrEP came about from a participant’s comment.

> “Weirdly, I think the first barrier is getting people to talk about it [HIV]. First of all you have to work off the stigmatism [sic] around the disease. People think ‘oh, that’s not me, that’s not my lifestyle.’ And you put yourself in a box. And you think, that person

over there, he's at-risk. So, second, you have to get that awareness out there. There is something you can do [to prevent HIV], but don't think that it's fool proof. Don't think that, 'oh it wouldn't happen to me'. Getting people to understand that this thing [HIV] is more widespread than they think. And then telling them how you prevent it from spreading."

Figure 1. Steps to PrEP Use model

Commented [DR6]: nice to get to the point of a possible 'intervention model' but seems like it involved a bit of a 'leap' that needs to be bridged with your data/findings. An important intermediate step would be to 'map' your themes/constructs to the different elements of this model (ie, how the model explicitly addresses the themes in your findings. This intermediate step would be facilitated by your having first developed a graphic framework of your findings.



The order of the steps does not exactly match the participant's suggestion; however, I created the order based on what I heard throughout the focus group discussions. Thus, the first step requires being aware of PrEP; second is reducing HIV-related and PrEP-related stigma and shame; third is making sure people have an accurate understanding of their risk for HIV

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infection; fourth is increasing accessibility to PrEP and last is to reduce concerns related to the use of PrEP.

Discussion

All the participants had positive attitudes toward the use of PrEP for HIV prevention. I identified five constructs related to reasons for low awareness and uptake of PrEP among gay men who reside in NYC: PrEP unaware, shame, low HIV-risk perception, low accessibility of PrEP, and PrEP use concerns (Table 1). These constructs were used to create a framework through which awareness and uptake of PrEP could be increased (Figure 1). The first step is to make people more aware of PrEP, as access to PrEP necessarily requires that a person has heard about PrEP. One policy recommendation is to have general practitioners discuss PrEP with patients at annual visits, especially if the patients are being screened for sexually transmitted diseases (STD). This may increase the awareness of PrEP among persons seeking medical care.

The most common themes that people expressed were related to shame and PrEP. To the best of my knowledge, this is the first study to identify PrEP-related shame as a barrier to using PrEP for HIV prevention (9). Thus, the second step is to reduce HIV-related and PrEP-related shame and stigma. Some participants expressed that they didn't think they would be at-risk for HIV infection. While this may be true, I believe it is important for people to have an accurate perception of their risk for infection, which is the basis for the third step. The last two steps are related to using PrEP: accessibility of a PrEP prescription and concerns about using PrEP. PrEP marketing should include information on drug safety and adherence. For widespread scale-up of PrEP to be successful, the concerns of potential PrEP users need to be addressed, and this framework could be useful as the NYC Department of Health and Mental Hygiene scales up biomedical HIV prevention methods throughout the city.

Only British participants discussed sex education as a way to increase a person's awareness of PrEP. Sex education in American schools is a contentious topic. Thus, while I would recommend that PrEP for HIV prevention be taught to students in schools that have comprehensive sex education programs, I'm not sure that sex education is a feasible way to increase the awareness of PrEP at the population level. The college students pointed out that student health would be an ideal venue for them to receive information about PrEP for HIV prevention, and I agree with this assertion. College students represent a cohort of individuals who are attending the same health clinics and are often living in the same neighborhoods and buildings, which may make marketing of PrEP easier. Providing information about PrEP for HIV prevention to college students via student emails and newsletters or at student health clinics may be a feasible way to increase the awareness of PrEP for HIV prevention among young persons.

Many insurance plans, including Medicaid, cover PrEP (10). However, insurance type or the lack of insurance will remain an important barrier to getting a prescription for PrEP. The PrEP drug is estimated to cost $8,000 to $14,000 for one year, which doesn't include laboratory tests or the four medical check-ups that would be required for a one-year prescription (10). British participants did not mention insurance as a concern, which may have been related to being used to having the NHS as a payer of medical services. The American participants were concerned about how health insurance, or the lack of insurance, would impact their ability to get a prescription. PrEP programs should consider addressing this barrier in protocols and developing policies to assist with drug costs.

Commented [DR8]: this language already suggests it's a *possibility*, not a certainty. Including "may not" is not necessary and actually undermines an *informed* , *plausible* explanation for the difference.

I have spent time talking with colleagues, friends, and family about the usefulness of and increasing access to PrEP. Thus, I approached this research question with a handful of preconceived ideas about existing barriers. For instance, I have heard and one small study has

shown that people often do not perceive themselves to be at-risk for HIV acquisition, despite being engaged in high-risk behavior (9). While conducting this study, I did not specifically ask about perception of risk for HIV. That being said, after I listened to my first focus group discussion I thought that some of my probing questions were a little leading, and I tried to correct this and be a more unbiased moderator in the last two focus groups.

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Conclusions

I identified five constructs related to reasons for low awareness and uptake of PrEP among gay men who reside in NYC. These constructs were used to create a framework to increase awareness and use of PrEP (Figure 1). The most common themes that emerged were related to shame and stigma surrounding the use of PrEP. To the best of my knowledge, this is the first study to show that PrEP-related shame may be a barrier to PrEP uptake (9). These data indicate that PrEP implementation programs should consider addressing PrEP-related shame and that student health clinics and college newsletters may be an efficient way to market PrEP to young adults. General practitioners should discuss PrEP with patients at annual visits, especially with patients seeking STD screening. For widespread scale-up of PrEP to be successful, the concerns of potential PrEP users need to be addressed, and the proposed Steps to PrEP Use framework could be useful as health departments scale up biomedical HIV prevention programs.

nice work; as noted above, would be considered more "complete" with further development of a (graphic) framework of your findings (eg, showing the inter-relationships/connections) that could then be 'mapped' to your proposed intervention.

Paper grade: 23/25

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Final Report
PUBH 806

Evaluating the Impact of a Mindfulness-based Study to Reduce the Risk of Childhood Obesity in Underserved Urban Middle School Youth in NYC.

Abstract

This study evaluates a mindfulness-based intervention aimed at promoting positive dietary and physical activity behaviors among under-served, middle-school youth in NYC. Through in-depth interviews with participants and key-informants the researchers found that participants at the end of the program had a high level of knowledge of mindfulness and mindful eating and that such concepts started to affect behavior change. This intervention can become an effective afterschool program that tackles not only childhood obesity, but also improves interpersonal relationships, management of stressful situations, and academic performance.

Overall Project

Introduction

Urban youth residing in low-income neighborhoods are at higher risk of obesity and have elevated environmental stressors compared to more economically advantaged peers,[1] which can result in long-term emotional, physical, and academic problems.[2] The high rates of crime and violence in these neighborhoods often prevent youth from engaging in physical activity outdoors and reduce mobility.[3] Hence, these youth tend to adopt more sedentary behaviors, further increasing their risk of being overweight and obese.[4]

Mindfulness interventions have been shown to be effective in reducing obesity and related disease risks through improved dietary behaviors in adults.[5] So far, most mindfulness-based interventions have targeted older individuals while only a few of these interventions were conducted in the youth population, mainly aiming at reducing mental stressors, such as anxiety and depression and improving self-esteem.[6] One different study has also shown promising results

in the impact of an Ashtanga yoga intervention to reduce weight among Hispanic youth at risk for type 2 diabetes.[7] The findings of these studies combined highlight the potential significance of mindfulness-based interventions as a tool to fight childhood obesity. However, further research is needed to better understand the impact of mindfulness techniques on dietary habits and physical activity behaviors among under-served young people, which is the reason why this study was developed. A program that educates on mindful eating, yoga, and stress reductions techniques could provide a unique opportunity to tackle the childhood obesity problem through a different angle, potentially increasing participants' overall well-being.

Intervention Format & Objectives

This quasi-experimental study included six weekly sessions of 75 minutes co-taught by a mindfulness-yoga instructor and a Public Health educator. The intervention's curriculum was articulated in the following components: (i) physical activity: when the youth were taught yoga-inspired moves and postures (ii) mindful eating and nutrition: which consisted of discussion and activities pertaining to all five domains of mindful eating (disinhibition, awareness, external cues, emotional response, and distraction)[8], and (iii) stress reduction: that consisted of breathing techniques and guided mindfulness practice to reduce stress and calm the mind.

The purpose of this qualitative research was to explore the impact of this intervention on psycho-social variables related to dietary and physical activity behaviors associated with childhood obesity and measures of mental well-being in low-income, urban middle-school youth. The specific objectives were to evaluate if a mindfulness-based intervention leads to: (i) changes in dietary and physical activity behaviors associated with childhood obesity, (ii) improved measures of mindful eating, (iii) decreased levels of perceived stress and improved levels of resilience.

Background and Significance

Increases in overweight and obesity have become a major public health problem and the rates are particularly alarming among children and youth. In the US, over the last three decades the rate of childhood obesity has tripled[9] and in New York City alone, nearly 40% of public school children in grades K-8 are overweight or obese.[10]

Biologically, overweight and obesity are a result of an energy imbalance where food intake exceeds energy expenditure. However, there are myriad social, economical, cultural, and political factors that lead to obesity and end up disproportionately affecting low-income youth and children.[11] Indeed, although babies and very young children are capable of self-adjusting their intake to match their outflow, as we grow up we lose this ability[12] so that food intake becomes influenced by external factors, such as: increase in number of fast food meals, low availability of nutritious food, increase in sugar beverage consumption, increase in portion size, etc.[13] Moreover, low-income individuals also have fewer opportunities to expend energy as poor neighborhoods have fewer parks and recreational centers[14] and violence and fear of crime discourage walking and biking.[15] Finally, people with low SES also tend to have less family meals, watch more TV, and feel the stress associated with poverty, which alone can lead to over-eating[16]

Methodology

Study population

A total of 24 urban youth residing in the low-income NYC neighborhood of Inwood were recruited. The study used a homogeneous sampling strategy in order to capture the experience of underserved, low-income, middle-school youth in NYC. Both genders and all ethnicities were recruited among participants of the Inwood Community Services Afterschool Program, and the

total number of participants includes both case and control groups.

Recruitment Strategies: The Principal Investigator of the study had established a deep relationship with Inwood Community Services (ICS), which is a not-for-profit community-based organization that provides, among other services, comprehensive after school programs for children in this community. The ICS site director for youth programs provided potential candidates for the program that were assigned either to the intervention or control groups. All recruited participants gave written informed consent and parental permission. The participants were provided with small incentives: 20$ Amazon gift card for all participants plus a yoga mat for case participants.

Measures and Instruments

The primary outcome variables of this study were psycho-social variables associated with dietary and physical activity obesity-related behaviors, while its secondary measures included mindful eating, perceived stress, and resilience.

The qualitative portion of the study collected data through in-depth interviews with intervention participants and four key informants. This specific method of data collection was chosen because of its powerful ability to make the participants' point of view intelligible to the researcher[17]. Although we acknowledge critiques of this method, which state that the interaction that takes place between researcher and participant during an interview might somehow shape the responses and the direction of the conversation, we firmly believe that it is still an extremely potent tool to understand participants' ideas, opinions, and understanding of events. This structured "conversation" allows the researcher to ask about specific issues that concern the research topic and, at the same time, gather insight and gain knowledge of themes, preoccupations, and suggestions that go beyond what s/he originally anticipated. Finally,

Commented [DR1]: should provide ref(s)

Commented [DR2]: that's the *intention* of the methods

Commented [DR3]: what you "firmly believe" will not pass muster with a peer reviewer – need to provide ref(s) as well as state that *all* methods of data collection have the potential to "direct/lead" respondents

interviews also allow the researcher to take into account tone, expressions, and body language as additional silent information.[18]

Commented [DR4]: which is, by the way, "observation" (which you tried to distinguish this research from, above)

The chosen key informants were the site coordinator and manager at Inwood Community Services, and the co-instructors of the program. Interviews took place one day after the end of the intervention; three were conducted in person and one by telephone.

Through the interview with the instructors we aimed to assess: (i) the feasibility of the program, (ii) ease of implementation, (iii) their perspective on the children's acceptability of the program, and (iv) perceived impact. The goal of the interviews with the site coordinator and manager was to consider: (i) if the participants mentioned the program and, if yes, in what ways, (ii) if they believed that the program could have a meaningful impact on this population, and (iii) the feasibility of the program as an after-school activity.

The goal of the interview with the children was to assess: (i) perceived impact, (ii) knowledge, (iii) behavior change and (iv) intended behavior change.

Process evaluation measures included: reach (number of youth attending each session), implementation (number of sessions conducted), and fidelity (extent to which the intervention was delivered as intended).

Data Collection and Analysis

Quantitative data was measured at pre- and post-test using a self-report questionnaire that included the Mindful Eating Questionnaire[19] and the 10-item version of the Perceived Stress Scale[20]. Process evaluation measures were monitored throughout the intervention's duration with a weekly questionnaire and field notes taken by the project coordinator and research assistant.

Qualitative data were collected through semi-structured in-depth interviews, which occurred at the intervention site after the end of the program.

The interview guide for the participants included 8 open-ended questions and for instructors and site coordinators it included 5 and 6 questions, respectively (see Appendices A, B and C for interview guides). All interviews were digitally recorded and later transcribed. Transcripts were uploaded and analyzed using Dedoose software.

The data were interpreted through a thematic analysis approach, following the general steps of data management as outlined by Ritchie et al.[21] Within the initial phase – *familiarization* – the researcher immerged herself in the data by reading all transcripts several days after the interview, with an extremely open mind, and without taking any notes. During the second read of the transcripts the researcher started identifying the portions of the text that were relevant to the research questions and creating large and encompassing codes. With the support of Dedoose software, the researcher entered the second phase of the analysis by *constructing an initial thematic framework.* This framework was created through the refinement of the first codes into different and more specific ones and the creation of different child-codes. In the *indexing and sorting* stage of the analysis, main themes were created and codes were merged within their umbrella. While *reviewing data extracts* the researcher reexamined all of the selected excerpts and, if necessary, reassigned them to more appropriate themes. Finally, in an effort to create an intelligible *data summary and display,* the researcher created a Codebook that showed the themes, codes, child-codes, their description, and related quotes in a set of matrices (see Appendix D)

Results

Three main themes emerged from the analysis of the transcribed interviews: benefits, obstacles and intervention assessment.

Benefits: Throughout the interviews participants mentioned several kinds of benefits that

were either related to concepts taught during the program or to the use of new skills that were gained through the intervention. In regards to notions that were learned in class, participants specifically articulated their perception of the benefits of mindfulness and of mindful eating. The concept of mindfulness seemed to resonate the most with the children in its "kindness" dimension. With expressions such as: *"[mindfulness]… would help us because it would help us not to hurt ourselves or anybody else"*, the children highlighted how mindfulness could help them be more kind and positive towards themselves and others. This finding was further corroborated by the fact that most children identified the "kindness exercise" of the program (in which they had to send kind and positive messages to themselves, relatives, and friends) as their favorite and most powerful one. Regarding mindful eating, recurrent benefits shared by most participants were the ability to eat healthier and/or less. As a female 7th grader explains, *"when you're mindfully eating you pay attention if it's junk food or if it's good for your body,"* and as her classmate added *"it helps you eat right at the point that your body is comfortable."* The ability to apply mindful eating in their daily lives was also mentioned by most participants as a benefit of the program. The children specifically described different situations in which they applied mindful eating showing comfortable familiarity with this concept and a clear idea of its benefits. Several participants identified practicing mindful eating with eating at a slower pace, and consequently, savoring their meals: *"before it was kind of a [eating] race between me and my siblings, now I don't really care if I'm second, or third, or last - I would eat the food and actually enjoy it"*. The other specific benefits of the intervention that were identified by the participants were: improved interpersonal skills, managing stressful situations, and school performance improvement. The participants' use of mindfulness techniques in their relations with others seemed to be one of the greatest benefits the children received from the program, and

it was also noted by two key informants, who further explained the importance of social relationships at the children's specific age. Participants also provided several examples of how breathing and thinking before reacting is now helping them in stressful situations. Some of them mentioned *"not getting into too much trouble"* after the program and *"taking the situation one step at the time instead of just hitting it head on"*, and these statements were supported by the after school program director, who saw a clear improvement in the children's ability to deal with stressful and uncomfortable situations in after-school. Finally, although the focus of the study was on behavior change in the areas of nutrition and physical activity, the participants' answers showed that the intervention content could be very useful in the academic context. Participants shared their experiences in applying mindfulness techniques in class or while doing their homework and emphasized how it's helping them improve their school performance. As one young 7th grader explained: *"after I did my test I mindfully looked over all my questions and the steps and I actually got a pretty good grade on that one"*.

Obstacles: The instructors foresaw obstacles in the actual application of the mindfulness concepts – mainly because children are not very introspective at this age and because the intervention wasn't long enough to actually make them develop a habit – but only two participants identified obstacles in the children's daily lives that would hinder mindful practice. Both of them mentioned that family represents the biggest barrier to the practical application of the concepts that were taught during the program. A young girl supports her point by sharing that *"[when]… we all start eating and I try to take my sweet time and then my mom is always telling me to hurry up"*.

Intervention Assessment: This final theme included specific problems and feasibility issues that the key-informants found during the program implementation and suggestions for

Commented [DR5]: This one, long paragraph reads like a list and doesn't seem to organize (or at least present) the categories (in yellow) in a way that incorporates the researcher's (your) analysis and *prioritization* of the findings. Hard to know what the main findings are/message is. It's, I think, partly a problem of presentation/organization (in separate, thematic paragraphs) and partly that your analysis has to go deeper and discern relative importance among (and, ideally, relationships between/across) the themes.

Commented [DR6]: Was nothing else discussed re obstacles??

improvement of the intervention by all respondents. The instructors identified communication with the site and duration of the class as the main problems they encountered, but were very adamant in saying that *"once the kids were here and we were all here I think we had very effective classes. Everything went smoothly, we didn't have any issues with anyone so I think being in the class was the easiest part".* Both instructors and children wished the sessions were longer, and when asked about suggestions for improvement, many said *"I would make it longer"* and *"I would build up the concepts more in depth".* Key informants and instructors also unanimously recommended to start this intervention with younger kids, even at kindergarten age since, as the after-school director explains: *"A lot of times we don't think that little kids are stressed out but they really are and we don't know what they are going through at home so I think that the younger, the earlier you can teach them the better".*

Discussion & Conclusion

The experiences and opinions that were shared by the participants seem to describe an overall successful intervention. There were concerns that this positive feedback was due to social desirability bias since the children might not have felt comfortable sharing negative opinions about the program with the interviewer, as she was present at all intervention sessions and was identified as one of the program organizers. In order to address this concern, the interviewer highlighted several times the importance of the children's honesty in their responses and how their comments could improve the classes and thus benefit other children.

Commented [DR7]: this might be better placed in the Strengths and Limitations section

The interview data allowed the researchers to assess the feasibility, shortcomings, and benefits of the intervention. As noted by the respondents, specifically by the instructors, the structure of the program needs to be slightly modified as to include more time dedicated to discussion activities within the mindful eating component.

One of the most interesting findings is the potential ability of this program to improve academic performance. Although this is not the main focus of the intervention, this benefit was overwhelmingly shared so many children – and one key informant – that it needs to be taken into account when designing future interventions of this kind. Academic performance seemed to have improved not only because of the use of breathing techniques during tests, but also because children were provided with tools to manage stressful situations, which can directly or indirectly affect school grades. Besides from a few participants specifically mentioning being able to have better relationships with teachers, many of them shared that the general sense of relaxation and tranquility they felt after the program was more conducive for homework and studying. A future intervention that specifically targets academic performance through mindfulness practice might increase funding opportunities as the program would be more "marketable" as an afterschool activity, and would become a more comprehensive and well-rounded program that not only tackles different dimensions of physical and mental well being, but academic performance as well.

Finally, a few respondents mentioned that their families represent their biggest obstacles to applying mindfulness concepts at home. Although this opinion was not expressed by the majority of the participants, it is still important to take it into account as it is aligned with most of the literature in this field, which identifies parental inclusion as a key factor in the treatment of childhood obesity.[22] Future interventions, besides from including longer sessions, a more detailed mindful eating component, and specific techniques for academic improvement, could ideally include three groups – control, "standard" intervention, and intervention with family inclusion – to more specifically examine the role that parents/families might play in helping or hindering children's use of mindfulness concepts in their daily lives.

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Final Report
PUBH 806

The initial findings of this study suggest that an after-school program based on mindfulness concepts can potentially tackle the issue of childhood obesity from a different perspective and provide the children with a comprehensive intervention on their mental and physical health.

Olivia, you did a very good job with the research but I think you ran out of steam with the next level (deeper) of analysis and the write up. This report doesn't do justice to the analyses you presented in earlier assignments but it does require more analytic effort to get to more *interpretive* analysis that explores/uncovers potential relationships/asscociations/processes. Development of graphic representations of the themes/codes helps with this level of analysis. Also, very important, benefits, obstacles, and program assessment are **not** "themes" from your findings – you started out with these 'neutral categories' in your data collection due to the study focus (you decided on them *a priori*) . **Themes** are what you find *about these categories*, or something else that you didn't necessarily set out to find.

Paper grade: 22/25

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APPENDIX A

Semi-Structured Interview Guide - Participants

I. Introduction

First of all I would like to thank you again for participating in our study. I would like to ask you some questions about our program, what you felt during and after the sessions and what you like and didn't like about them. Feel free to say whatever you want and take as long as you want to answer a question. Don't feel bad if you have negative things to say about this project, because your feedback will really help us make it better for other children. Everything you say here will be private. If you don't want to talk about something or feel uncomfortable answering any questions, you don't have to. Just let me know you would like to skip that part.
I will have this recorder on so we can go back and listen to our conversation if we need to. It is much easier than trying to write everything down as we go along. Is that ok with you?
Do you have any questions before we start?

II. Interview Questions

Now I would like to start asking you a few questions, is that okay?

1. How do you think that mindfulness can help you in your daily life?
2. What are some situations in which it might be helpful to use mindfulness?
    a. For example, now how would you handle a situation like getting into an argument with a friend?
    b. Or trying to focus before a test?
3. What do you think are the benefits of mindful eating?
4. After participating in the program some kids changed the way they eat and some didn't. How was it for you?
    a. Any other eating habits that you changed?
5. How has participating in the program affected the way you think things through before making decisions?
    a. How so?
    b. Can you give me an example? Another one?
6. What did you like the most about the program?
    a. *If participant answered a part related to the "yoga" component ask what he liked about the "mindful eating" and vice-versa*
    b. Anything else?
7. What didn't you like about the program?
    a. *If participant answered a part related to the "yoga" component ask what he didn't like about the "mindful eating" and vice-versa*
    b. Anything else?
8. How would you improve the program?
    a. Any other suggestions?

III. Closing

That's all the time we have. Thanks for taking the time to talk to me. Before we finish, is there anything else you'd like to tell or ask me?

APPENDIX B

Semi-Structured Interview Guide – Instructors

I. Introduction

I would like to thank you again for helping us with our study. Your work was crucial to our project and I feel that the children really liked you and your teaching style. I would like to ask you some questions about the program; your opinions on the impact of this intervention and its feasibility. Feel free to say whatever you want and take as long as you want to answer a question. Don't feel bad if you have negative things to say because your feedback will help us improve the intervention. Everything you say here will be private. If you don't want to talk about something or feel uncomfortable answering any questions, you don't have to. Just let me know you would like to skip that part.

I will have this recorder on so we can go back and listen to our conversation if we need to. It is much easier than trying to write everything down as we go along. Is that ok with you? Do you have any questions before we start?

II. Interview Questions

Now I would like to start asking you a few questions, is that okay?

1. How would you evaluate the feasibility of this program?
2. How would you assess the ease of implementation of the program?
    a. What was the hardest part to implement?
    b. And the easiest?
3. How do you think the students accepted the program?
4. How has the program affected changes in the kids' behavior?
    a. Can you share some examples?
5. What do you think is the age range of participants that could benefit from this program?

III. Closing

That's all the time we have. Thanks for taking the time to talk to me. Before we finish, is there anything else you'd like to tell or ask me?

APPENDIX B

Semi-Structured Interview Guide – Site Coordinator & Manager

I. Introduction

I would like to thank you again for helping us with our study; your support was crucial to our project. I would like to ask you some questions about the program, your opinions on the impact of this intervention and its feasibility. Feel free to say whatever you want and take as long as you want to answer a question. Don't feel bad if you have negative things to say because your feedback will help us improve the intervention. Everything you say here will be private. If you don't want to talk about something or feel uncomfortable answering any questions, you don't have to. Just let me know you would like to skip that part.

I will have this recorder on so we can go back and listen to our conversation if we need to. It is much easier than trying to write everything down as we go along. Is that ok with you? Do you have any questions before we start?

II. Interview Questions

Now I would like to start asking you a few questions, is that okay?

1. I know that some children have mentioned the program outside of class and some haven't. What have you heard from them about this intervention?
    a. *(if they heard mention of the program)* In what ways?
    b. When would they mention it?
2. What about other people mentioning his program? (parents, other children…)
    a. In what ways?
3. In your opinion, how can this program have a meaningful impact?
    a. Can you be more specific?
4. In your opinion, how have the children benefited from participating in this program?
    a. In what ways?
    b. Any examples?
5. How feasible is this intervention as an after-school activity?
6. What do you think is the age range of participants that could benefit from this program?

III. Closing

That's all the time we have. Thanks for taking the time to talk to me. Before we finish, is there anything else you'd like to tell or ask me?

APPENDIX D - CodeBook

Theme	Code	Child Code	Description	Quotes
Benefits	Benefits of the Program	Applied Mindful Eating	Participants' application of the concepts of mindful eating in their daily lives	*"before it was kind of a race between me and my siblings, now I don't really care if I'm second, or third, or last - I would eat the food and actually enjoy it"*
		Improved Interpersonal Skills	Participants use of mindfulness techniques in their relations with others	*"I think that's where they are thinking about applying [mindfulness] the most: in how they respond versus react to other people"*
		Managing Stressful Situations	Participants' ability to use mindfulness techniques in stressful and/or uncomfortable situations	*"when I'm mad at somebody I first think at the consequences before doing anything irrational" / "now I take the situation one step at the time instead of just hitting it head on"*
		School Performance Improvement	Participants ability to use mindfulness techniques for academic purposes	*"after I did my test I mindfully looked over all my questions and the steps and I actually got a pretty good grade on that one" / "I don't care that I don't do homework here because I go home and I have the calmness that I need to sit down and do it"*
	Benefits of Mindful Eating	N/A	Participants articulate on their perception of the benefits of mindful eating	*"when you're mindfully eating you pay attention if it's junk food or if it's good for your body" / "it helps you eat right at the point that your body is comfortable"*

	Benefits of Mindfulness	N/A	Participants articulate on their perception of the benefits of mindfulness	*"it would help us because it would help us not to hurt ourselves or anybody else; it would give us a piece of mind" / "it help us make the right choices"*
Obstacles	Difficulties in Applying Concepts	N/A	Identified obstacles in the daily lives of the respondents' that would hinder mindful practice	*"the introspective mindful practice personal part is a little more difficult for this age group because they are so social at this age" / "we all start eating and I try to take my sweet time and then my mom is always telling me to hurry up"*
Intervention Assessment	Program Implementation	Feasibility	How easy or difficult was the actual implementation of the program (key-informants only)	*"Once the kids were here and we were all here I think we had very effective classes. Everything went smoothly, we didn't have any issues with anyone so I think being in the class was the easiest part"*
		Problems	What obstacles did instructors encounter in the implementation of the intervention (key-informants only)	*"I think that the mindful eating [component] could have been built out a little bit more in depth for them to be thinking about it in a deeper way" / "I think timing was probably the most difficult and also having the kids actually show up"*
	Future Intervention	Suggestions for Improvement	Participants and key informants provided recommendations to improve the program	"*I would make it longer" / "I would build up the concepts more in depth" / "I would definitely include the parents"*
		Target Population	Key informants identified what age range could benefit form this kind of public	*"A lot of times we don't think that little kids are stressed out but they really are and we don't know what they are going through at home so I think that the younger, the earlier you can teach them the better"*

	Mention of the program	N/A	Mention of the program by participants outside of class, by parents, other school teachers, etc.	*"they mentioned it a lot, actually going home and telling their moms to get their yoga mats"*

Second Exam
Draft October 13, 2015

- Introduction
- Understanding Fertility Intentions
  - Theory Behind Fertility Intentions
    - Theory of Reasoned Action
    - Theory of Planned Behavior
    - Theory of Planned Behavior Applied to Fertility Intentions
      - Attitudes
      - Subjective Norms
      - Perceived Control
- Fertility Intentions and Links to Behavior
- Fertility Intentions, Age and Health
  - Fertility Knowledge and Age
  - Literature Review of Fertility Intentions and Age
- Quantitative Data for Examining Fertility Intentions
- Qualitative Data for Examining Fertility Intentions
- Analyzing Data on Fertility Intentions
  - Quantitative Methods
    - Approach
    - Multivariate Regression (Linear)
    - Logistic Regression
    - Multivariate Regression of Fertility Intentions Data in Practice
- Qualitative Methods
  - Approach
  - Qualitative Analysis
  - Qualitative Methods and Fertility Intentions Data in Practice
- Gaps in the Literature and Future Research
- References
- Tables and Figures

Introduction

How individuals think about and plan for having children is of interest to researchers from diverse disciplines. For example, intentions about the timing of children and desired number of children may have important implications for population projections (Demography), for population health (Public Health), labor force participation (Economics), and use of social welfare (Public Policy). In Public Health, these intentions, particularly around the timing of children, have important health implications both for individuals and for the population as a whole. As women delay their first birth they may experience difficulty achieving pregnancy and carrying to term, they may have more complicated pregnancies due to "advanced maternal age" which may require more intensive and expensive medical interventions, and they may turn to assistance from infertility treatments in getting pregnant such as in-vitro fertilization, which may have health effects for both the mother and child. This paper will examine the interplay between fertility intentions and age, with a particular eye towards women of "advanced maternal age" and whether and how fertility intentions change as women age and reproductive technologies become more common and sophisticated. This paper will also examine fertility intentions at both the population and individual levels.

Understanding Fertility Intentions

Fertility intentions[1] are future plans regarding having or adopting children. These are frequently operationalized as the desire to have children and intended number of children (family size) and are commonly examined in social science research. They are less frequently operationalized to look at timing of pregnancy, such as ideal age to have a child ( ). Fertility intentions may be hypothetical and are distinctly different from pregnancy intentions, which focus on outcomes of pregnancies after the pregnancy has occurred (Santelli et al 2009).

Theory Behind Fertility Intentions

Theory of Reasoned Action

Research on the meaning and implications of fertility intentions draws on the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975; See Figure 1) and the

[1]Although here I use the term intentions when referring to whether and how many children a respondent wants, Hagewan and Morgan note that respondents in nationally representative surveys do not typically differentiate between intended and expected when asked about their fertility intentions (Hagewan and Morgan, 2005).

Theory of Planned Behavior (see Figure 2). In both of these models, individual intentions are central to performing a behavior. In the Theory of Reasoned Action (Figure 1) intentions are a precursor to performing a behavior and are influenced by attitudes about that behavior and subjective norms surrounding the behavior. In this model behaviors also "feedback" into attitudes and norms, creating a cycle in which these intentions and behaviors exist. According to Ajzen & Fishbein (1975) intentions involve four elements: the behavior, the target at which the behavior is directed, the situation in which the behavior is to be performed, and the time at which the behavior is to be performed. In early work on the Theory of Reasoned Action (Ajzen and Fishbein, 1977 and noted in Rindfuss et al 1988) they note that attitudes and behaviors are strongly related when the following criteria are met: the relative action is unambiguous, and the target, context, and time of the action are specified (Ajzen and Fishbein, 1977 and noted in Rindfuss et al 1988).

Theory of Planned Behavior

The Theory of Reasoned Action was later refined in the development of the Theory of Planned Behavior (Figure 2). In discussion of the Theory of Planned Behavior, Ajzen notes that intentions are "indicators of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior" (Ajzen 1991). Intentions are positively related to the likelihood of performing that behavior, and stronger intentions are associated with increased likelihood (Ajzen 1991). However, as Ajzen & Fishbein (1975;1980) and Ajzen (1991) note, intentions lead to behavior only when the behavior is able to be controlled by the individual and the required opportunities and resources are available for the individual to success (A&F (2 citations); Ajzen 1991). In other words, actual behavior is a function of intentions and what Fishbein & Ajzen call "perceived behavioral control," or how much internal control an individual feels she/he has over the behavior (1975; 1980). In the Theory of Planned Behavior subjective norms also exert an influence on behavior. Ajzen (1991) defines subjective norm as "perceived social pressure to perform or not to perform the behavior" and suggests that a favorable attitude toward the behavior, favorable norms with respect to the behavior and a high level of perceived behavioral control lead to a greater likelihood that the individual will perform the behavior.

Theory of Planned Behavior Applied to Fertility Intentions

Many of the components in the Theory of Planned Behavior map nicely with factors examined in fertility intentions research. For example, subjective norms around child bearing, particularly the

timing of first child and family size, are an important consideration in thinking about fertility intentions, and behavior and norms around child bearing are frequently studied in tandem with intentions. Ajzen and Klobas (2013) have applied the Theory of Planned Behavior to fertility intentions (Figure 3) to aide in our understanding of how intentions lead to fertility outcomes. In this model, attitudes towards having children, subjective norms around having children,and perceived control operate synergistically to create individual intentions. These intentions only then lead to the intended behavior if there is actual control over the behavior. This theory also makes note of a significant number of background factors that contribute to attitudes, norms, and perceived control and exert influence on intentions (Ajzen and Klobas, 2013). As Mencarini and colleagues note this is a multi-factor paradigm where "fertility outcomes...are seen as depending directly on fertility intentions, which in turn depend directly on attitudes (related to the perceived benefits and/or costs of reproduction), subjective norms (related to the social approval of behavior from relevant others), and perceived behavioral control. Possible constraints can further intervene from the time the fertility intention was formed and the subsequent behavior (such as a disruption of the couple's relationship or changes in individuals' health conditions or job status) (Mencarini et al, 2015).

Attitudes

Research into fertility intentions has noted the influence of these theories in how we think about and study fertility intentions. Attitudes about having a child are based on behavior beliefs about the outcome of having a child. In fertility intentions research, this includes questions about the perceived benefits and detriments for having a child. As Azjen and Klobas (2013) note, these can include items like measuring agreement with statements such as "I believe having a child is a necessary part of being an adult" or "I believe a child would restrict my freedom to do the things I enjoy". As noted in discussion of the current state of research on fertility intentions, there is relatively less focus on attitudinal items as compared to behaviors (?).

Commented [DR1]: not really sure what this sentence is saying

Commented [DR2]: awkward/unclear term; may need to just "write it out" more so it's clear

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Subjective Norms

Norms concerning fertility intentions, according to Ajzen and Klobas (2013) pertain to injunctive norms and descriptive norms. Injunctive norms come from being told or inferring what others (such as partners, parents, friends) want us to do. Descriptive norms are more easily measured and these include items like the number of siblings in the respondent's family. These norms can be subtly different from beliefs; Ajzen and Klobas give the example that the behavioral belief that "my partner would be pleased if I had a child" is different from the normative belief that "my partner wants me to have a child". In the latter, pressure is exerted from outside the individual

and may influence his/her intention around having children. There is a fair amount of research on fertility intentions that has addressed the effects of norms and ideals on intentions. Researchers acknowledge that fertility intentions may be highly influenced by fertility ideals, which reflect the normative context around which fertility decisions are made (Hagewan and Morgan, 2005) and that these social norms produce a strong push/pull on individuals as they make these choices (Morgan and Rackin, 2010).

Perceived Control

Perceived control in terms of fertility intentions focuses on the "resources and obstacles that can facilitate or interfere with having a child" (Azjen and Klobas, 2013). In fertility intentions research, this focuses on factors that contribute to the decision to have a child, such as the availability of childcare and housing, which are items found in the Generations and Gender Survey across Europe. These factors are also explored in qualitative work on childbearing such as work by Edin and Kefalas (2005) and Hewlett (2003).

Fertility Intentions and Links to Behavior

In addition to using the Theory of Planned Behavior to understand how intentions relate to behaviors, researchers have empirically examined the connection thanks to longitudinal studies of individuals throughout their reproductive years. Westoff and Ryder examined what they call the 'predictive validity of reproductive intentions'. Using data on more than 2,300 white married women in the U.S. from the National Fertility Study conducted in 1970 and 1975, they found that reproductive intentions tend to overestimate the number of future births (40.5 percent had intended more in 1970 and by 1975 only 34.0 percent had an additional birth). They also found that intentions were more likely revised downward than revised upward, a finding later confirmed by Morgan in 1982. An important note here is that Westoff and Ryder view intentions as a tool useful for population projections, not necessarily as an interesting phenomenon themselves. They conclude that "reproductive intentions are tailored to conditions at time of interview and, thus, share the same possibilities of misinterpretation as other period indices. In brief, we are skeptical of the usefulness of reproductive intentions, at least for short-range population projection purposes." (Westoff and Ryder, 1977)

Following Westoff and Ryder's work, Rindfuss and colleagues (1988) examined ways in which fertility intentions are related to behavior. In this work they looked at the stability of childless

intentions and unanticipated delay in having children. Using data from the National Longitudinal Study of the High School Class of 1972, the authors were able to follow respondents from 1973 to 1979 to examine the stability of childless intentions and found that they were very unstable at the individual level. They postulate that this is partly because the question about ever having a child is not time bound, but forces young adults to think decades into the future and they are unlikely to be able to say with any real certainty. Using the same data, they also examined the consistency between intentions and behavior, particularly focusing on unanticipated delay, or the group of respondents who intended to have a child in 1976 but did not yet have one by 1979. They found that this delay was related to lower parental SES (females) and lower employment levels (males) but no real pattern emerged. They propose that the delay is not consequential for a group this young (age 22-25 at the time of the last round of data) and it is still socially acceptable to delay parenthood (Rindfuss et al 1988).

Schoen and colleagues used data from the National Survey of Families and Households to examine the relationship between fertility intentions and behavior, using a sample of over 2,800 non-Hispanic whites interviewed in 1987-1988 and again from 1992 to 1994. This sample included non-sterilized adults ages 16-39. The authors found that individual intentions regarding future fertility and their certainty are an important predictor of future fertility behavior (Schoen R, Astone NM, et al 1999). They examined the relationship between intentions, behavior and time and found that the effect of intentions on behavior are 'remarkably persistent' though they are less consistent over time. Schoen and colleagues compare their findings to Rindfuss and colleagues noting that they found that certainty of intentions was more important than timing expectations. Schoen and colleagues found that expectations about the timing of fertility were significantly associated with behavior only in the short term. Among other variables and their relationship to fertility behavior, marital status was the most important. Importantly, the authors also discuss where fertility intentions operate in relation to other variables, noting that intentions "do not mediate the effects of other variables" but that they are important in their own right. The authors conclude that "fertility is a purposive behavior that is based on intentions, integrated into the life course, and modified when (?) unexpected developments occur". (Schoen R, Astone NM, et al 1999)

Others have found that fertility intentions such as intended family size are a proximate determinant of actual fertility behavior (Hagewan and Morgan) but that behavior is influenced by a number of other factors. Using data from the 1979 National Longitudinal Survey of Youth,

Morgan and Rackin (2010) examined the correspondence between intended family size as reported in earlier surveys and observed fertility among men and women in the 1957-1964 birth cohort. The authors found that discrepancies between fertility intentions and actual fertility were common. In particular, having a child before age 24 (women) and 29 (men) led to individuals overachieving their intended parity while having children later more often led to underachieving, even when controlling for potential confounders (Morgan and Rackin, 2010). This is an important finding in relation to trends in first birth in the U.S. If women delay their first births they may underachieve their desired parity due to 'aging out' of their reproductive years (Monnier, Leridon citations)

Monnier, using data from the National Institute for Demographic Studies (France) examined intentions and behavior for 2,000 women over the period 1974-1979 (1974, 1976, 1979). He found that consistency between intention (as measured in 1974) and behavior (as measured in 1979) was about 80% for women with one child who intended to have a second and 76% for women who had two or more children and did not want to have an additional child. He found that for women with one child who reported that they did not want to have a second, consistency was lower at 62% and notes that perhaps women felt pressured to keep with social norms of having a two-child family. Another finding from this work is that the consistency between intention and behavior was much stronger for women whose intentions remained the same in 1974 and 1976, suggesting that the strength and/or certainty plays a role (similar to the findings of Schoen et al.) , and the longer an intention has been held the more "robust", according to Monnier. Related to age and intentions, Monnier notes

> "...it should be noted that time has opposite effects on intentions and behaviour of women who wished to have a child. With the passing of the years, their intentions tend to change, but, at the same time, the degree of consistency between intention and behaviour becomes stronger. This contradiction is a reflection of the underlying selection procedure: women who, in 1976 or 1979, had still not produced the child they desired in 1974 undoubtedly experienced greater difficulty in conceiving or, more generally, were subject to conditions which were less favourable to a birth. Revising their original intentions down-wards can, therefore, be interpreted as an acknowledgement of their difficulty or even inability to conceive (Monnier, 1989)

The "mere-measurement effect" refers to the fact that when intentions are measured they can be influenced, or that when you ask an individual about his or her intentions just asking about the intentions makes acting upon those intentions more likely. Thaler and Sunstein (2008) call this a 'nudge' and note that social scientists have found this to be true in many contexts. (Thaler and Sunstein, 2008)

Commented [DR4]: also referred to as a "study effect" (eg, Hawthorne effect in organizational settings), described as one of many threats to validity by Cook and Campbell. More of a *methodologic* issue; maybe weaved into appropriate section further down?

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Fertility Intentions, Age and Health

In Ajzen and Klobas' model, they note two important components in thinking about fertility intentions as they relate to advanced maternal age and the use of assisted reproductive technologies: perceived control over having a child and beliefs about enabling or interfering factors. The increase in the availability and sophistication of fertility treatments coupled with shifting norms in parts of U.S. society about parental age and delaying first birth have led to an interesting moment to re-examine fertility intentions and what these intentions mean for the health of a population. Fertility intentions and their relation to age have important implications for public health. The mean age at first birth among women has steadily risen in the U.S., from 21.4 years in 1970 to 25 years in 2006 and in some states the mean age is now above 27. (Mathews and Hamilton, 2009) This trend is important since older women attempting to conceive may have difficulty due to advanced age (defined as >34 years). Although the use of fertility treatments such as IVF and ICSI have increased (SART annual report, 2013) by more than 60,000 cycles from 2003 to 2013, corresponding research on the long-term health effects of such technologies has not kept pace. The use of fertility treatments and assisted reproductive technologies to conceive may influence the health of the mother and/or child in ways that are not yet fully understood. (Halpert J. no date)

Infertility is estimated to affect 7.4% of married women 15-44 in the U.S. (Almeling RA. 2007) or, according to the American Society for Reproductive Medicine, about 10% of women of reproductive age overall. (Centers for Disease Control and Prevention, 2008) Women having difficulty conceiving may turn to infertility treatments in order to have a child. Infertility treatments include three levels:

Level I: ovarian stimulation including the use of medications such as clomiphene

Level II: use of gonadotrophins to stimulate the ovaries; may include intrauterine insemination (IUI)

Level III: assisted reproductive technologies, including in-vitro fertilization (IVF).

Women starting infertility treatments may progress through the levels before reaching pregnancy, which can take 2-3 years (Gleicher, 2000). If women under 35 wait to begin treatment until one year of having unprotected sex without conceiving, as recommended by the National Institutes of Health (https://www.nichd.nih.gov/health/topics/infertility/conditioninfo/Pages/consult.aspx), or women older than 35 wait six months before seeking treatment, then women will be progressing through

their less fecund years[2] while moving through the fertility levels. This likely makes conceiving more challenging due to age-related decline in fecundity. Leridon, using historical data from France to simulate natural fertility, estimates that if a woman postpones birth from age 30 to 35, she reduces her chance of conceiving by 9% and the use of ART can compensate for 4% of that lost fertility. For a woman who postpones from 35 to 40, she reduces her chance of conceiving from by 25% and ART compensates for only 7%. (Leridon, 2004). In other words, the use of ART can compensate for some of the fertility lost to delaying age at first birth, but some women will still not be able to achieve a conception (Leridon, 2004). Women over 30 are the majority users of ART in the US, accounting for almost 89% of all assisted reproductive technology procedures performed in the US in 2002 (Bitler 2011).

Fertility Knowledge and Age

Despite the increased age at first birth and growing use of fertility treatments, there is limited research on what women know about fertility and age-related fertility decline. One study, examining knowledge of fertility decline among women in Canada who had already had a live birth found that women had knowledge of the conception difficulties associated with advanced maternal age but had limited knowledge of the health risks associated with childbearing at later stages.(Tough et al 2006) A study of university students in Sweden found that both men and women had 'overly optimistic' perceptions of a woman's ability to become pregnant at later ages, with almost half of women in the sample intending to have children after 35 without an understanding of the decline in fertility that begins in the mid-30s. (Lampic et al 2006) Another study examining fertility knowledge among childless women 20-50 years across Canada found that despite women having high knowledge of fertility decline and factors that affect fertility, more than 70% believed that for women over 30 overall health and fitness level was more important than age in its effect on fertility (Daniluk, 2011). Another study in the UK confirmed the finding that women erroneously believe that healthy habits are very important in achieving pregnancy (Bunting, 2008). There appears to be very limited recent (post 1970) research examining fertility knowledge among women in the U.S. generally. A 2009 nationally representative study of 1800 young adults 18-29 focused on fertility knowledge as it relates to unplanned pregnancy. Specific fertility questions focused on contraceptive use and failure rates. One noteworthy finding from this study was that 19% of females and 14% of males responded that it was "quite likely" or "extremely likely" that they are infertile, which is

[2] Beginning around 32 and increasing rapidly around 37, as per the American College of Obstetricians and Gynecologists, 2008

Commented [DR6]: don't know if you get to this later but might 'evidence' of older mothers in society fuel this belief in the absence of specific knowledge of whether ART was used/needed by those individuals?

Commented [DR7]: I have a **scathing** critique of that study – can fill you in when we chat

Commented [8]: There was a problematic (in my opinion) national study in 2009 (conducted by the NCPTUP and Guttmacher) of young adults that included 'knowledge' Qs. See: https://thenationalcampaign.org/resource/fog-zone I'm happy to discuss it, as it also points to problems with quant vs. qual approaches, as well as ingrained assumptions among researchers and lack of considering historical context

statistically unlikely (NCPTP 2009 and Almeling). Follow-up questions to discern why female respondents believed they are infertile included whether a doctor had told them (25% yes), a relative is/was infertile (24% yes), or they have unprotected sex and have not gotten pregnant (35%) yes (NCPTP 2009). Other studies examining fertility knowledge in the U.S. appear to be narrowly focused on a specific demographic, such as cancer patients. If we assume that knowledge in the U.S. is similar or less than that of respondents from the UK and Canada, then this lack of knowledge is startling especially given the large shifts in age at birth in the U.S. with births to women above 30 growing steadily (Figure 4, Martin et al 2015) and shifts among some subgroups, such as among Asian and Pacific Islanders where the age at first birth is now well over 28. (Hamilton, 2009).

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Commented [DR10]: this has been found in other studies, particularly among AA women (not sure about Latinas) – let's discuss

Literature Review of Fertility Intentions and Age

There is limited research to date on the influence of age on fertility intentions. Previous research has examined how fertility intentions differ by age, gender, and parity in the UK. This study, using data from the British Household Survey (a panel study), found that women tended to reduce their intended family size as they aged (Berrington, 2004). This study also found that childless women grew more uncertain about their intentions with age. An important finding was that among the oldest group of women, 44 percent did not have the child they originally intended. Berrington notes that "for many of these women the increase in sub- and in-fecundity with age means that time will be running out" (Berrington, 2004). In a sub-sample of childless women, Berrington found that age is strongly related to the probability of intention to start a family, as is education level, but partner status is not significantly associated with intention. Berrington suggests that women who postpone childbearing into their 30s but intend to have children have high levels of education and high earnings. Further sub-sample analyses, specifying three different models, were carried out with older childless women (in 1992) who went on to have a child in the following six years. The first model included demographic and socioeconomic characteristics, the second model included those characteristics included in model one and added women's intention (Yes, no, don't know). The third model included those characteristics in model one and added joint fertility intentions to test the effect of a partner with similarly positive intentions. In all three models age was a key factor in predicting that the woman would have a birth. In model 1 a one year increase in age was associated with 0.73 lower odds of having a child in the next six years ($p<.01$) In model 2, fertility intentions had a strong, positive independent effect on actual fertility (odds ratio = 7.22). In model 3, women with a partner who also intended to have a child were 36% more likely to achieve a birth (Berrington,

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2004). Berrington notes in her conclusion that further research is needed to examine the "perpetual postponers" (those who postponed childbearing into their 30s but intend to start a family) and whether those who do not achieve a birth are restricted by biological, social and/or financial constraints (Berrington, 2004).

In the US, Morgan (1981) examined fertility intentions in relation to the "later stage of childbearing" but defined that late stage not by age, but by whether woman intended to have fewer than two additional children (i.e., they were nearing the end of their desired parity). The focus of this research was not focused on how age relates to intentions per se, but on the uncertainty surrounding intentions and it made the case for treating intentions as more refined than a yes/no dichotomous variable. However, this study did show that certainty around intentions does vary by age and parity and this certainty decreases as women get older (Morgan, 1981). Morgan posits that uncertainty is a transitional stage between childbearing and post-childbearing stages and that once women reach 'minimal acceptable' family size, the interval between children grows too large, or they develop non-familial interests that "compete with the desire for more children" they revise their intentions downward (Morgan, 1981). This study is one example of where either qualitative research or additional survey questions that probed on some of these issues could shed some light and provide a more nuanced understanding of the factors that affect fertility intentions. Although it focused on pregnancy intentions and age, not fertility intentions, a study by Keeton and Hayward (2007) used data from the Pregnancy Risk Assessment Monitoring System (PRAMS) to look at the relationship between poor birth outcomes (including low birth weight and NICU admissions) and pregnancy intention. The authors, to their surprise, found that intention was associated with poor outcomes at a young age. They suggest that this finding could be the result of retrospective intentions being revised once an infant is born, or social desirability bias of reporting a child in the NICU as unintended (Keeton and Hayward, 2007). The Generations & Gender Programme (GGP) Survey conducted in countries across Europe is an example of a large scale (multi)national survey that also collects additional, more detailed information about fertility decisions. (http://www.ggp-i.org/) The GGP is a longitudinal survey of adults 18-79 living across Europe that aims "improve our understanding of the various factors - including public policy and programme interventions - which affect the relationships between parents and children (generations) and between partners (gender)". The GGP includes quantitative survey questions on what components go into making the decision to have a(nother) child including whether and to what magnitude the decision depends on other factors (GGP website). These factors include:

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Commented [DR13]: why surprising? I think you need to say a little more about this, including whether age was treated categorically (eg, age group 15-19 yo) OR continuously (eg, *relatively* younger mothers had worse outcomes on the order of….)

financial situation; work; housing conditions; health; having a suitable partner; partner's/spouse's work; partner's/spouse's health; availability of childcare; opportunity for parental/care leave (GGP website). This type of data is often absent from large cross-sectional surveys, but found in qualitative research such as in-depth interviews, where the opportunity to probe responses may lead to information on *how* a respondent arrives as a decision to have a child, for example, not just the outcome of that decision. The Social Position and Family Formation (SPAFF) data set (D'Amore 2013; Nell, 2013) is an example of the kind of rich qualitative data that can be developed to aid in understanding the nuance in fertility intentions, including how young adults make decisions about when to have children and what factors contribute to the timing of these decisions. The SPAFF dataset also provides much needed diversity in this information, since the quantitative literature focuses predominantly on white (often married) women (such as the sample used in Morgan, 1982, Morgan 1981, Rindfuss and Westoff, and Schoen et al 1999).

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Quantitative Data for Examining Fertility Intentions

Fertility intentions are often examined at the population level using data from cross-sectional surveys including the Demographic and Health Surveys (developing countries) and National Survey of Family Growth (US). These surveys yield responses to questions such as how many children an individual intends to have and whether an individual wants to have a(nother) child (Table 1).

The literature on fertility intentions includes much research on desire to have a child and intended number of children among women in the U.S. using data from the NSFG. Articles that examine fertility intentions in the U.S. tend to fall into a few specific categories: measurement and theory, trends in intentions over time or across subpopulations, and in-depth examination of factors thought to be related to these decisions, such as religiosity and education.

Regarding measurement and theory, in addition to those items addressed in the previous sections on the link between fertility intention and behavior, S. Philip Morgan has written extensively on fertility intentions among women in the U.S. Starting in the early 1980s, he examined intentions in the later stages of childbearing using data from the National Fertility Survey in 1965 and 1970[3], finding that the uncertainty of intentions is related to both parity and

[3] The National Fertility Survey was fielded in 1965, 1970 and 1975. The surveys were quite different: The NFS 1965 included currently married women born after 1910 and living with their husbands; the NFS

age and that women with more children are more likely to consider revising intentions downward once they have reached the 'minimally acceptable' family size (Morgan, 1981). Later Morgan examined ideal family size and its relation to age, suggesting that delayed fertility that is due to period-specific factors and influences may lead to fertility foregone and that uncertainty about fertility intentions is often a transitional stage between delaying pregnancy and fertility foregone (Morgan 1982). He also found that intentions are subject to revision and that intentions may be "revised downward" once the two-child ideal has been reached. In this paper, he also made the claim for including infertile/infecund women in analyses of fertility intentions (Morgan 1982).

Fertility intentions are often studied in relation to trends. Chen and Morgan (1991) examined trends in the timing of first births and the relationship with intentions among women in the U.S. over the period 1970-1987 using vital registration data. They found that there was a clear shift towards parenting at older ages, including a substantial increase in first births to older women. They also found childlessness was for the majority of women not the result of a conscious decision, but the result of postponement of childbearing, which eventually became fertility foregone (Chen and Morgan, 1991). It is important to note that this study was conducted at a time when the availability of assisted reproductive technologies was very new and treatments for infertility were limited. It wasn't until 1992 that the Centers for Disease Control and Prevention (CDC) began surveilling clinics providing these technologies so the data on actual usage in the late 1980s is not available. (http://www.cdc.gov/art/reports/index.html).

One study examining fertility intentions and religiosity and is of particular interest for my research due to its use of the NSFG and intention to have a child as the outcome of interest. This article used data from the 2002 NSFG and examined intention to have a child as the dependent variable. The main independent variable of interest was religiosity. A main finding is that women who report that religion is 'very important' have higher intended and realized fertility than those who report that religion is 'somewhat important' or 'not important' (Hayford and Morgan, 2008). Other research has examined the effect of education, social policies, and economic opportunities on fertility intentions. Heiland and colleagues, using data from West Germany (1998, 1994/5) and the EU 15 countries (2001) found that increases in education were

1970 included ever-married women born after 1925; the NFS 1975 reinterviewed women interviewed in the NFS 1970 who were 1) white, 2) continuously married in first marriage, 3) married less than 25 yrs, 4) married before age 25, and 5) husband married only once. The NFS 1975 also included a sample of new interviewees who were married after 1970. (Office of Population Research, Princeton: http://opr.princeton.edu/archive/nfs/)

associated with wanting three or more children (Heiland et al 2005). Liefbroer and Corjin (1999) to the contrary found that among Flemish and Dutch young adults born between 1961 and 1965, educational attainment had a strong negative effect on women's entry into parenthood but not on men's. Neyer and colleagues (2011) found that cultural norms surrounding fertility had a greater effect on fertility intentions compared to regional economic circumstances. This study used the Generations and Gender Survey, a longitudinal Survey of 18-79 year olds in 19 countries across Europe (cite http://www.ggp-i.org/) to explore how the economic, social and cultural environment influences fertility intentions (Neyer, Vignoli, Lappegard, 2011).

In the quantitative literature examining fertility intentions there is a noticeable lack of diversity among respondents. Due to the structure of the NSFG and the analytical techniques used to analyze the data, the majority of studies focus on (often married or coupled) white women. A study by East (1998) is a notable exception. In this study, using a racially and ethnically diverse sample of 574 young adolescent females (mean age 12.9) in the U.S., East found that birth expectations varied among subgroups. Hispanics were more likely to desire having children younger and Southeast Asians were more likely to desire having children later. She also found that for all groups optimistic school and job aspirations were tied to later desired age at first birth (East, 1998).

Qualitative Data for Examining Fertility Intentions

Although data from nationally representative surveys are extremely useful for making inferences about a population, the nature of surveys masks some nuance, which may be very important in truly understanding how, when, and why these decisions are made. As Edin and Kefalas note (2005) "social science currently tells us much more about what doesn't explain the trend than what does" (Edin and Kefalas, 2005). They note that social science depends too heavily on survey methodology which tells us very little about perspective and life experiences of the populations in question (Edin and Kefalas, 2005). Qualitative methods may be extremely helpful for both getting at this nuance and also for allowing researchers to better understand how individual-level decisions are made. In public health, this nuance is very important in designing programs and policies that are aimed at changing individual-level behavior such as programs that may aim to educate individuals about fertility and age and encourage a shift away from delayed childbearing, such as programs found in some Nordic countries (Hoem, 2005). For example, as mentioned in the intentions and NICU admissions study by Keeton and Hayward (2007), the authors reported a surprising finding that intention was associated with poor

outcomes at a young age. This is a good example of where qualitative data could be used to further explore and explain a phenomenon.

Studies looking at individual fertility intentions alone are rarely found in the qualitative literature, but more commonly included in studies examining how fertility intentions are influenced by other factors such as HIV status (Laher et al 2009, Harrington, et al 2012) or focusing on the qualitative aspects of pregnancy intentions (Kendall et al, 2005). Sassler et al (2009) conducted a qualitative study of fertility intentions of cohabiting couples to better understand how decisions around fertility are made. Questions focused on how a (hypothetical) pregnancy at that moment might be resolved and examined perceptions of the couple's future and how their contraceptive use related to those plans (Sassler, 2009). Augustine, Nelson and Edin (2009), in one of the few fertility intentions studies focusing on men, examined intentions among low-income, noncustodial fathers in and around Philadelphia. This research examined retrospective intentions around the birth of their child(ren). They found that a continuum of intentionality is more reflective of the experience of this group rather than a dichotomous view of intentionality (Augustine et al 2009). One study examining women's experiences with waning fertility as they approached menopause, used a phenomenological approach, with the aim of understanding the subjective experience of waning fertility. In this study, the authors found that when individuals were asked to look back on their fertility, some who were childless reported that they had never intended to have children and others reported that they had just never had the 'right' circumstances. In addition to retrospective views of their fertility, the authors asked about their prospective views: women reported uncertainty about their intention to have a(nother) child, including uncertainty in general and a re-examination of previous decisions to not have a(nother) child as the door to have children began to close (Jarrett & Lethbridge, 1994). As one woman (age 42) noted, the decision to have a child was competing with the decision to go to school: "within the last 4.5 years, I've really wanted to have a kid, but working it around school and new interests...and so the tentative plan is to interview for school this January or February. If I don't get in- get pregnant. If I do get in- get pregnant the second year" (Jarrett & Lethbridge, 1994). An interesting finding from this study that is important to my research is how the delay in first birth affects how women think about approaching menopause. The authors found that women who had children in their late 30s and early 40s "were not able to conceptualize a time when their life would be their own again" compared to women who had children earlier. The women who had children earlier viewed 'the emancipation of their children' as a marker for midlife and the freedom that would come with it (Jarrett & Lethbridge, 1994).

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Commented [DR16]: need to further unpack – your linking the biological process/phase of "menopause" to women's thinking about "freedom" when empty-nesters, is not totally clear

Other important qualitative literature on family formation has focused on women and the decision to have children, but from the vantage point of already having children. This work, by Edin and Kefalas (2005) was developed partly in response to the popular culture's focus on how highly educated, wealthy women thought about the timing of pregnancies after the book *Creating a Life: Professional Women and the Quest for Children* was published in 2002. That book, which was part interviews and part self-help, focused on women "taking back their lives" and achieving their goals of motherhood while still maintaining high level and high paying professional lives. *Creating a Life* also focused on telling the "real stats behind IVF" so that women could make informed decisions. The qualitative data presented in this book focused on nine "high-achieving women from the breakthrough generation" (Hewlett, 2002). Shortly after the media storm calling for attention to how wealthy professional women think about and seek motherhood, Edin and Kefalas began a multi-year anthropology-inspired study of over 160 low-income women living in areas of Philadelphia and Camden. In this work, the authors explore common misperceptions about low-income women and motherhood, such as the claim that low-income mothers get pregnant based on lapses in judgment or that childbearing out of wedlock is the sign of poor planning on the part of these women. Of importance to my topics, they note that many of these women do not understand how women could delay childbirth until their 30s by choice expressing a preference for or ideal of childbearing at younger ages. In terms of fertility intentions, many of these women do not report explicitly trying to become pregnant, but aren't attempting to prevent pregnancy either. Having a child when you are young and unmarried can be advantageous and for a relationship and strategic for a woman's career since she can 'get it over with' before turning her attention to school and a professional life. In these communities, having a child marks adulthood and comes with a level of responsibility and respect that may not come from being in school and working (Edin and Kefalas, 2005).

Commented [DR17]: FYI, researcher's response to the 'analysis' in this book was published in a paper called "Creating a Lie" (I think within/about a year later)

Commented [DR18]: ?

In previous research undertaken as a doctoral student, Diana Romero and I used data from the SPAFF study to examine ideal age at first birth and how individuals conceptualize the factors that contribute to a particular age being ideal. Using data from 200 in-depth interviews with males and females of diverse socioeconomic and ethnic background aged 18-34 in New York City and Northern New Jersey, we found that early 30s were most often cited as ideal (32% of the sample). Among those who gave a particular ideal in response to the questions "what is the ideal age to have a child" the mean was 29.3 years.( ). We found that factors associated with

ideal age fell into four categories: structural/social position related, interpersonal, age pressure, and aspirational.

Analyzing Data on Fertility Intentions

Quantitative Methods

Approach

Quantitative data on fertility intentions often focuses on responses to two questions that address 1) wanting a child; and 2) desired number of children. These data tend to come from cross-sectional surveys. Analyses of these data typically use multivariate regression in order to control for a number of factors that are theoretically believed to be related to fertility intentions such as race/ethnicity, education, income, poverty level, employment situation, place of residence, and religiosity. Independent variables are often included in these regression models based on their influence in the model during univariate analyses (such as in Hall et al x2). However, Wu's important paper on using generalized linear models in family studies (2005) makes a compelling argument for only including independent variables based on theory (Wu, 2005). In his example we should begin adding variables to a model if their inclusion is supported by prior research. Variables should not automatically be removed from the model if they are insignificant based on bivariate analyses, but the theory and reasoning behind their inclusion should be considered. As an example, he notes that in research aimed at testing the idea that the effects of living alone change with marital status, he notes that an interaction term of marital status and living alone should remain in the model even if it does not improve model fit since this interaction is a key component of the research aim (Wu, 2005). Berry & Feldman (1985) make a similar argument in their discussion of specification error, asserting that "the best to whether a variable is irrelevant is theory" (Berry & Feldman, 1985).

Commented [DR19]: was interested in taking a look at this ref but not in biblio (yet)

Multivariate Regression (Linear)

Multivariate regression is a method for explaining a dependent variable (y) as a function of a continuous independent variable (x) , controlling for factors that may simultaneously affect the dependent variable. Multivariate regression allows for the inclusion of other (measurable) variables of interest to be included in the regression model, whereas in simple regression they would have been part of the error term. Multivariate regression does not limit the number of independent variables that may the researcher feels may be associated with the dependent

Commented [DR20]: what are you referring to here? what is 'simple regression"?

variable. Essentially, it allows researchers who work with non-experimental data to mimic the kind of research that is done in laboratory settings by holding factors constant (Wooldridge, 2006). The multivariate regression model is as follows:

a. $$y= \beta0+ \beta1x1+\beta2x2+ \beta3x3...+\beta kxk+ \mu$$

Where β0 is the intercept, β1 is the parameter estimate associated with *x*1 and *μ* is the error term.

A simple multivariate regression model for fertility intentions may look like this:

b. $$\text{Intend}=\beta0+ \beta1\text{age}+ \beta2\ \text{parity}+\mu$$

Where intentions are a function of age and parity, plus an error term. In this model, β1 estimates the effect of age on intention to have a child, holding parity constant and β2 estimates the effect of parity on intentions, holding age constant. In social science research ordinary least squares (OLS) regression is frequently used for its focus on reducing the sum of squares of the residuals. OLS chooses the estimate that provides the smallest sum of squares of the residuals. This means that it chooses the estimate that is the "best fit" for the model by selecting the one where the residuals (difference between observed and predicted values) are the smallest (Wooldridge, 2006).

It is important to be selective in determining which independent variables to include in the analysis so as to specify the most parsimonious model possible. Although it is tempting to consider myriad factors related to the research question and, thus, add many variables to a model, inclusion of irrelevant variables can bias the *variances* of the OLS estimates (though not the OLS estimates themselves) (Wooldridge, 2006). An equally important issue is neglecting to include an important variable in the model, which can bias the variables included in the model in either direction (Wooldridge, 2006). Both of these situations refer to model specification error (Berry & Feldman, 1985).[4] Moreover, thoughtful a priori consideration of independent variables is important when specifying the analytic model given that the output from analyses of different models does not inform as to missing variables (ie, potentially relevant factors). It is somewhat

Commented [DR21]: saying essentially the same thing as originally written (,e, with the 'and')

[4] A third component of specification error (measurement errors in variables) will not be discussed here.

easier to statistically identify when an unrelated variable was erroneously included by examining the R^2 (ie, estimate of overall model-fit) and by running the model again without that variable. But as Wu (2005) and Berry & Feldman (1985) stress, variables with theoretical significance should be retained even if their inclusion reduces model fit. Box 1 includes four criteria used to guide decisions around whether to drop a variable from a model.

Commented [DR22]: should probably describe briefly in the narrative

In multivariate regression of data from cross-sectional surveys (with random sampling) there are a number of assumptions that must be considered, which are known as the Gauss-Markov assumptions as shown in Box 2 (Wooldridge, 2006). These are useful to consider in the development of model building and are essential for testing the validity of a model at the analysis stage. If any of these assumptions are not met, one may have increased risk for Type I (rejecting a null hypothesis when the null is true) and Type II (failure to reject a null hypothesis) errors.

Commented [DR23]: ditto re Box 1

Logistic Regression

Thus far I have been discussing regression models for continuous data which are often analyzed using models such as that shown in equation A. Linear models are based on assumptions that may not be relevant for fertility intentions data, including that the dependent variable is continuous and normally distributed and the relationship between the dependent and independent variables is linear (Wu 2005). The assumptions are not met in examining fertility intentions (as in equation B above) where intentions are a categorical variable, measured frequently as Yes, No, and Don't Know. The nature of the responses to this question and the types of questions in Table 1 lend themselves to different regression methods that, although they conceptually share many qualities with linear models, allow for these types of dependent variables. These include logistic regression (for binary response categories such as yes/no responses) and Poisson and negative binomial regression (for count responses).

Logistic regression is used to relate a binary outcome (y) to a predictor (x) using a linear equation. Predictors can be continuous, binary, or categorical (UCLA ats) This linear equation relates the ln(odds) of y to x (UCLA ats). The simple logistic regression model equation is as follows:

c. $$\text{logit}(p)=\log(p1\text{-}p) = \beta 0+ \beta 1x1$$

In this equation, p is the proportion (probability) of y=1, β_0 is the intercept, and β_1 is the difference in ln(odds) between the two groups (UCLA ats). Slopes calculated from logistic regression can be exponentiated to produce odds ratios (UCLA ats). In fertility intentions, a simple logistic regression model might look like this:

d. $$\text{Intend} = \beta 0 + \beta 1 \text{age}$$

or

e. $$\ln(\text{odds of intending a child}) = \beta 0 + \beta 1 \text{age}$$

Where *intend* (ln(p/1-p)) is the probability of intending a child for a given age.

Since the Gauss-Markov assumptions shown in Box 2 cannot be used for logistic regression, there are other statistics that can be used for evaluating the fit of the model including the model Chi-Sq and the pseudo-R2 to see if the overall specified model is statistically significant.

Results from logistic regression are often expressed as odds ratios, where the coefficients are exponentiated to produce odds ratios. The interpretation of ordinary (binary) logistic regression is as follows (Gould ats ucla ref):

$$\frac{\text{odds (if the corresponding variable is incremented by 1)}}{\text{odds (if variable not incremented)}}$$

For example (using the model shown in d above), if the exponentiated coefficient for age is 0.5, then the odds of intending a(nother) child halve for each yearly increases in age (assuming age is measured continuously) (Gould ats-ucla ref). This can be interpreted as for each additional year in age, an individual has 0.5 less odds of intending a(another) child.

Multivariate Regression of Fertility Intentions Data in Practice

Although statistically it may be most appropriate to use logistic regression or other regression models in fertility intentions research with dichotomous outcomes, in the literature some researchers also use OLS and provide methodological explanations for this choice. For example, in Bitler et al (2011), for a study of the effects of insurance mandates on the use of infertility treatments using pooled data from the NSFG, the authors used OLS for ease of interpretation despite having a binary dependent variable. They also include results from logistic regression (including marginal effects) of the same model, demonstrating that the results from OLS are robust. Similarly, Hayford and Morgan (2008) in their study of the influence of

Commented [DR24]: I think this needs fixing

Commented [DR25]: ditto

Commented [DR26]: in relation to what? statistical significance is usually applied to measures of difference between 2 variables. Need to word differently if you're talking about a model.

Commented [DR27]: redundant

religiosity on fertility intentions, use OLS and note that “Poisson or negative binomial models might technically be more appropriate for this analysis….(however) our results were robust to the specification of the model, and chose to use linear regression for the convenience of the interpretation of the coefficients” (Hayford and Morgan 2008). As compared to logistic regression, results from OLS are more easily interpreted. Logistic regression transforms the y variable into a log odds, so interpreting results from logistic regression requires an understanding of odds and what makes odds different from probability. For example, in Bitler and Schmidt’s paper they analyze data using both OLS and logistic regression but focused on the OLS results in the write up. In noting a coefficient of 0.041 from OLS examining the insurance mandate, age at least 30, and at least some college, they write “This suggests that for highly educated older women, living in a mandate state is associated with a 4.1 percentage point increase in the probability of ever having had sought medical help to get pregnant”. Results from the same model using logistic regression (presented in table format in the paper) would interpreted as “for highly educated older women, living in a mandate state is associated with a 1.948 odds of having had sought medical help to get pregnant” which is less easily understood, especially if the results are at aimed at non-researchers such as policy makers and the media. Logistic regression also makes it more difficult to detect potential errors that may make the model a less good fit, such as heteroscedasticity, whichrefers to uneven variance in the errors terms.

In the fertility literature, there are options regarding how to treat intentions when they are the dependent variable, which has an impact on the type of logistic regression that is best suited for the analysis. In Morgan’s work from the early 1980s, he makes the case for treating ‘don’t know’ and other uncertain responses as uniquely different from missing data, as valid and meaningful responses about an individual’s fertility intentions (Morgan, 1982, Morgan, 1982). In his earlier work (1981) he found that capturing this uncertainty was especially important for women nearing the end of their childbearing (in terms of parity). For example, using data from the NSFG in 1976, he found that for women with two children, there were an equal number of women who “don’t know” their intentions for another child as compared to those who said yes, they intended to have a(nother) child (Morgan, 1981). In including uncertainty as a crucial part of the intentions variable, the methods must be adjusted according. For example, in his papers on intention and uncertainty at later stages of childbearing (1981) and parity-specific fertility intentions (1982), the variable ‘do you and your husband intend to have a(nother) child?’ is treated not as a binary variable, but one with multiple categories requiring the use of multinomial

logistic regression in the case when they are not ranked, for example, when Morgan (1981) created three categories: Yes; No; Don't know. In 1982, he further refined this to a 'ranked' or ordered categorical structure including four categories for the dependent variable: Yes, 2+ more; Yes, 1 more; Don't Know; No (Morgan, 1982). In both of these treatments of the response to the question of intending a(nother) child, the responses are treated at a greater level of specificity than yes/no. This is supported by qualitative data, such as that from Augustine et al (2009), which found that among low-income, noncustodial fathers, reflections of intention to have a child operated on more of a continuum of wanting versus not wanting, rather than a dichotomous view of intentionality.

Qualitative Methods

Approach

As discussed, there are limited qualitative data examining fertility intentions but the data that do exist focus on a deeper understanding of the context in which decisions are made. These type of data often come from in-depth interviews, where a researcher has a one-on-one interview with a participant that explores a limited number of topics and often includes "probing" or "drilling down" on topics of particular relevance to the research question (Boyce and Neal, 2006). This type of data collection allows for the researchers to explore a topic in-depth and to allow the participant to fully respond to questions beyond predetermined answer categories such as in a survey. One advantage to using qualitative methods such as in-depth interviews as compared to surveys is that in addition to acquiring answers to questions the researchers identified in advance, the data may also provide insight and answers to questions the researcher did not think to ask (Beer, 1997). This type of data collection is often used in pilot or formative research to identify potential questions and topics for quantitative data collection at a later date, but is also used to collect the type of data such as collected in SPAFF that is not easily captured in surveys because it is either too complex or too delicate (Ritchie and Lewis, 2003).

Despite the advantages to using qualitative methods such as in-depth interviews, there are some drawbacks that limit their use. Compared to cross-sectional surveys, in-depth interviews include far fewer individuals, which reduces the generalizability of the findings to larger populations, which is useful for understanding population-level intentions for purposes such as population projections. This is a common critique of qualitative data collection among researchers evaluating it through a quantitative lens. In looking at fertility intentions research, an area dominated by demographers and sociologists, quantitative methods are seen as superior

to qualitative methods since the goal is often generalizing to large populations (Small, 2009). However, this is not the goal of qualitative researchers who instead of seeing individual cases as representative of a larger group (as individuals in a cross sectional survey would be representative of some larger group based on sampling weight) we view cases as a single case (Small, 2009). In qualitative work we are not seeking representativeness or a sample large enough so that potential biases can be 'controlled away' as Small (2009) puts it. Instead we are intentionally seeking not a 'sample' in the traditional (quantitative) sense, but a selection of individuals from which we can learn about a specific research question or phenomenon (Small 2009).

Commented [DR28]: very important and should probably further explain/describe the goal as identifying **factors/variables** relevant to the phenomenon (presented nicely by Auerbach and Silverstein)

This re-orientation away from the quantitative/statistical lens requires some adjustment on the part of the researcher. The methods utilize to collect and analyze the data are also quite different. In-depth interviews, as compared to cross-sectional surveys, may be more time and labor intensive and produce a large amount of text that must then be analyzed using methods that require a different approach to the data than quantitative methods, and require the researcher to be reflexive (Auerbach and Silverstein, YEAR). In depth-interviews are not simply survey questions read aloud to a participant, but requires a breadth and depth of questions to map content and to mine content, and a range of potential probing questions (Ritchie and Lewis, 2003). In fertility intentions research the type of dichotomous questions typically asked about wanting a child would be replaced by more open-ended questions about attitudes and desires around childbearing, and probing questions to address the factors that contribute to these individual attitudes and desires.

Commented [DR29]: process/role of reflexivity should not be an "add-on" like this; best to describe it in its own right, with more detail; crucial to addressing the claim of 'subjectivity' often lodged toward qual research. I also have a ref on reflexivity you may want to look at

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Qualitative Analysis

As opposed to quantitative data analysis, which is deductive and focused on testing a researcher's theory of a phenomenon, the analytic approach with qualitative data is inductive, ie, without a priori hypotheses, thus, allowing for themes and topics to emerge from the data. This draws heavily on grounded theory methodology, an approach developed by Glaser and Strauss (1967) and refined by Strauss and Corbin (1994). Grounded theory methodology is an analytic approach to qualitative data that identifies important themes/concepts related to the phenomenon under study grounded in open-ended and contextualized data from respondents (S&C, 1994). This is accomplished by applying codes to the data, grouping these codes into categories/themes and then refining these categories into concepts/constructs using a

repeating/iterative process. This involves open coding where the data are "broken open" as LaRossa describes, and transcripts are closely examined and questions are developed about the phenomenon in question. The next step is axial coding, where a researcher digs deeper into one topic or code and looks for how to relate categories to subcategories (Strauss and Corbin, 1994). The third coding step is selective coding, or as LaRossa puts it "the main story underlying analysis". This step is more focused and refined, with a clear view toward the question you are trying to answer. Together these concepts may lead to a theory about the phenomenon or research question (S&C, 1994). In previous qualitative research, my approach to the analysis of in-depth interviews has also been influenced by the subsequent (and arguably more "step-wise/pragmatic" application of the Grounded Theory method) work of Auerbach and Silverstein, who advocate for using a coding procedure that involves a series of steps, grouping repeating ideas/themes and eliminating less common ones, and progressing to higher levels of abstraction that may approach theoretical propositions (Auerbach and Silverstein, 2003). These levels include, first, identifying text-based primary categories and subcategories ("relevant text"), second, grouping of the text-based categories into larger themes ("repeating ideas"), and third, organizing themes into more abstract theoretical constructs. During the initial approach to the data, the researcher is also developing analytic logs (Memos") to map shifts in thinking about the focus of the analysis as well as to guide the development of schematics and tables that may become useful in developing theory. The initial coding approach is what Ritchie and Lewis (2003) refer to as a 'code and retrieve' method whereby categories are developed and codes are applied across all data. However, this is an iterative process and although some codes and categories may seem appropriate after reading 20 transcripts, by transcript 100 they may have changed substantially. One advantage to the 'code and retrieve' method is that it applies a somewhat systematic review to take stock of the data (Ritchie and Lewis, 2003).

An additional tool that aides in thinking systematically about the data is the creation of visual tools such as matrices, which encourage making comparisons, seeing patterns, and identifying differences in the data that may lead you to see you data differently (Miles, Huberman, and Saldana, 2013). As Miles et al note, the "matrix is a tabular format that collects and arranges data for easy viewing in one place, permits detailed analysis, and sets the stage for later cross-case analysis with other comparable cases or sites". This type of visual allows the researcher to see how the data is shaping up and identify areas for comparison. It also aides in theory-building, since often many factors that may together be part of a conceptual framework may

appear in your matrix and it may become apparent how they intersect and interact to influence the phenomenon at the center of your inquiry (Miles et al, 2013).

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Qualitative Methods and Fertility Intentions Data in Practice

In research on fertility intentions qualitative data may be very helpful for understanding factors related to the desire and timing of children that are not captured by cross-sectional surveys. For example, cross-sectional surveys capture data on a number of variables that may be considered independent variables in a regression model including education level, marital status, parity, and income level. However, information about desires around the timing of a child and how an individual's thinking about having a child is influenced by those factors is not able to be captured in survey form. In the SPAFF data set, we see the value of these type of data in interviews where respondents are asked about their ideal age to have a child and then probed for what factors make for an "age ideal." Beyond answering the interviewer's question, respondents went beyond and talked about things such as the order of events or their aspirations for their personal life before having a baby. One important thing that emerged from these data that was not directly asked was some individual's ideal timing and how that contrasts with biological realities. For example, Keisha is a single, 32-year old. If her timing works out she will be 35 or 36 at the earliest when she tries to start a family:

> *Of course, marriage first, then once we figure if I'm married, let's just say between two and three years, because I want to get to at least enjoy it with no kids. After that, go to school and from there get a degree and then kids come along. Even while I'm in school, I wouldn't mind being pregnant then. I would definitely want to at least be married first. From then on, of course the house. First and foremost I think I would want to be married first. (Keisha, single, age 32)*

In the analysis of this data, we looked at themes including structural/position related factors associated with the ideal age to have a child ("school", "degree"), interpersonal factors ("married"), aspirational ("I want to get to at least enjoy it with no kids"), and financial ("housing"). We also looked at how old Keisha was at the time of the interview, her situation at the time in terms of partnership status and educational level, and her timeline to examine the cognitive dissonance between what she is saying about her desire to have a child and her reality in terms of timing and her own fertility if she waits for all of these factors to fall into place before attempting to conceive. This is what is sometimes referred to as a quasi-variable approach, in which some variables such as demographic variables like age, race/ethnicity and

income level are examined in cooperation with conceptual categories coded within the data (Ritchie and Lewis, 2003).

In practice, it is more difficult to find specific details on the analysis used in many qualitative research studies. Often articles will tell you about the approach to the data and level of coding, but not to the extent that you could recreate the research step by step, the way you might be able to recreate research explained in quantitative studies. For example, in a study of self-induction for abortion, the authors describe their research methods as "We aimed to identify recurring patterns and outliers of the varying situations in which women attempted self-induction" (Grossman, 2010). X et al's study of low-income non-custodial fathers describes the analyses quite simply noting that "we coded these transcripts using standard qualitative methods…we then retrieved coded material for more refined qualitative coding and analysis" (Augustine, Nelson and Edin, 2009). This is partly due to the difference in approach in that qualitative research relies on the active participation of the researcher in a way that is foreign to quantitative research. However, there are some studies that have provided insight into how the data were analyzed. Edin and Kefalas, although they focus on pregnancy intentions in their discussion of the coding and analysis approach, describe coding each transcript it its entirety and coded relevant text into predetermined or emergent topics. They then describe a final product that was organized "like a quantitative dataset, in a case-by-variable" format (Edin and Kefalas, 2005).

Gaps in the Literature and Future Research

There is a notable lack of research in the U.S. on fertility knowledge, particularly how it relates to age. This is a remarkable absence in the face of the considerable research and attention (i.e., publicity, funding) given to sexuality education and in particular abstinence education for young adults. Young adults often have required sex education that focuses on preventing pregnancy, sexually transmitted infections and HIV, but may graduate from that education without any understanding of their own fertility, and in particular how fertility declines with age. This lack of knowledge combined with upward trends in the age at first birth may mean that many young adults have unrealistic expectations about their own fertility. When they do attempt to conceive and essentially 'flip the switch' from preventing pregnancy to encouraging it, they may need to turn to ART to aide in achieving a live birth. ART has grown more sophisticated and more common, with more than 60,000 cycles from 2003 to 2013 (SART annual report, 2013) but research on the effects of ART, and in particular on the long-term

effects of these technologies on both women receiving the treatments and other actors such as egg donors, has not kept pace. We have very limited information on the long terms effects and safety of these procedures; yet, their growth continues.

Given the interesting shifts in age at first birth coupled with the increasing availability of ART, one could postulate that the social norms surrounding both age at first birth and the use of ART are changing too, which may result in interesting cohort trends over time. For example, do women who were in the mid-30s in the 1970s differ significantly from women in their mid-30s today in their intentions and expectations around childbearing? We might expect to see that with the change in social norms comes a change in fertility intentions, with more women being confident about their ability to postpone childbearing until an 'ideal' time without having to self-limit the number of children they desire. Data from the NSFG would allow for this kind of comparison, using pooled data sets from the 1970s to the most recent round of the NSFG in 2011-2013.

A notable deficiency in fertility intentions research to-date is the lack of attention paid to male intentions around fertility and to intentions of minority populations, ie, those who are *not* female, partnered, white, (and often, middle class) at the time of the survey. Qualitative methods have taken on these groups that have been seemingly neglected by cross-sectional surveys, and have provided an interesting counterexample to the narrative put forth by demographers when it comes to discussions of fertility intentions in the U.S. However, there is still much more work to do. Currently, we see representation of these groups typically in small, focused studies, such as the work of Edin and Kefalas looking at how low-income women, often non-white, in inner city Philadelphia make decisions about childbearing. While these studies are very important for providing the viewpoint of these often neglected groups, we need additional research in order to shed a light on how other groups make decisions around whether, when and how to have children. We should push for more inclusive studies in two ways: 1) cross-sectional and longitudinal surveys that are nationally representative, but perhaps with oversampling of some groups in order to have enough statistical power to make comparisons across groups; and 2) qualitative studies that include participants from diverse backgrounds and from different races/ethnicities rather than splitting these groups into separate 'niche' studies.

Commented [DR32]: NSFG does do this

parking lot

As discussed in Ajzen and Klobas (2013) fertility intentions are stable and predictive at the population level, (Hagewen and Morgan 2005) but may not be stable and predictive at individual level. Bumpass and Westoff (1969) suggest that the difference between the stability and predictiveness of aggregate intentions versus individual intentions can be explained by unwanted births being balanced by unrealized intended births (Ajzen and Klobas, 2013).

; as Morgan and Rackin noted:

> "...fertility intentions... [are] both highly contingent and highly constrained. Fertility intentions are highly contingent because they are imbedded within an unfolding life course that intersects with historical time (i.e., period factors). Intentions and attempts to realize them are also highly constrained because of subfecundity or infecundity, structural obstacles (e.g., difficulty finding a spouse or full employment), and social norms. (Morgan and Rackin, 2010).

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(will convert to appropriate style with reference manager later)

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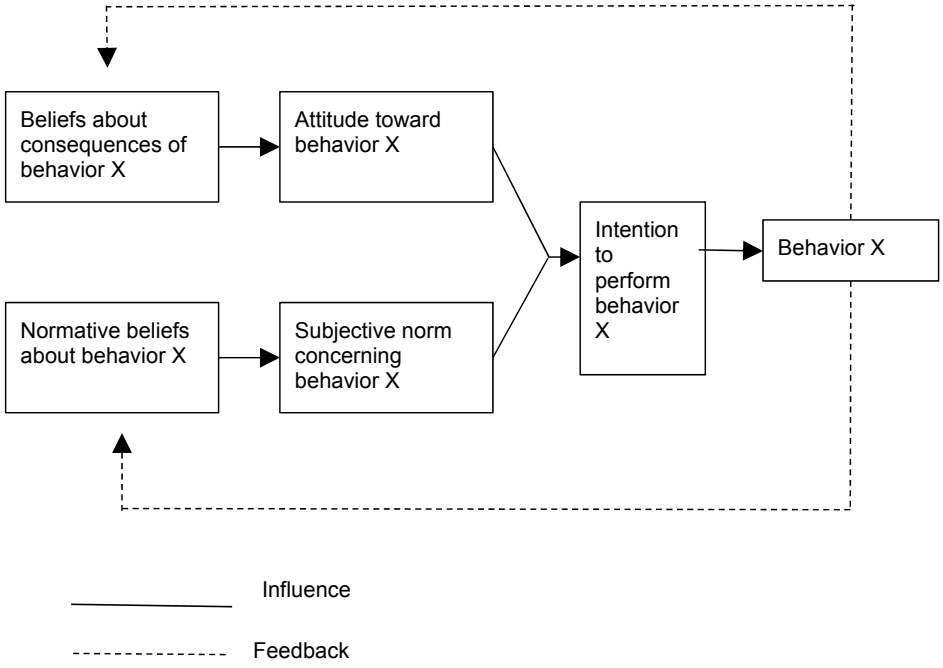
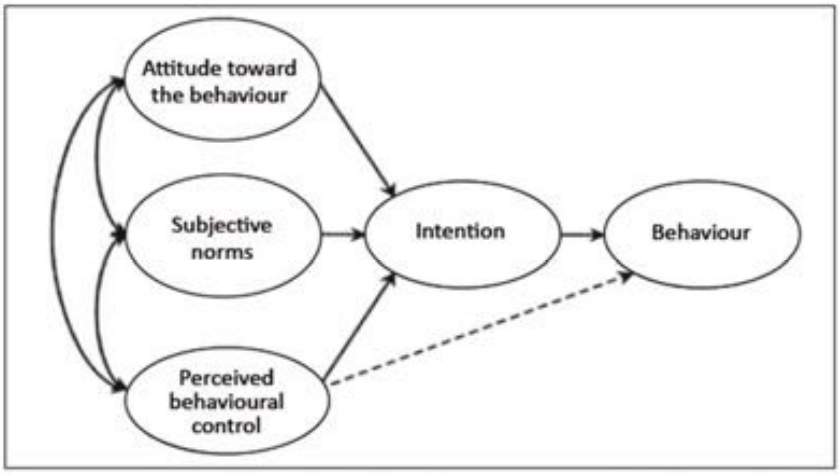
Tables and Figures

Figure 1. Theory of Reasoned Action



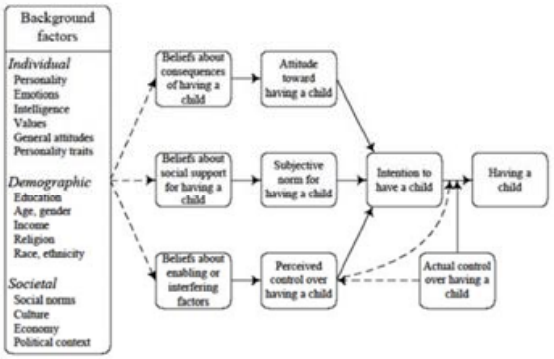
Commented [DR33]: Source: Fishbein and Ajzen

Figure 2. Theory of Planned Behavior



Source: Ajzen, I. (1991). Theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50*, 182. http://dx.doi.org/10.1016/0749-5978(91)90020-T

Figure 3. The Theory of Planned Behavior Applied to Fertility Decisions



Source: Ajzen I, Klobas J. Fertility Intentions: An approach based on the theory of planned behavior. Demographic Research, 2013;29(8):203-232.

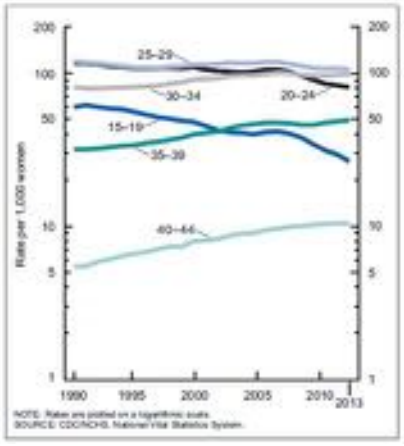


Figure 4. Birth rates, by selected age of mother: United States, 1990-2013
Source: Martin et al. Births: Final Data from 2013. National Statistics Vital Reports. 2015;64(1).

Box 1: Four Important Criteria for Specification

Theory: Is the variable's inclusion in the model theoretically sound?

t-test: Is the variable's estimated coefficient significant in the expected direction?

R2: Does the model fit improve when the variable is included?

Bias: Do other variables' coefficient change significantly when the variable is included?

Source: Studenmund AH. Using Econometrics: A Practical Guide. 2000. New York: Pearson.

Box 2. Gauss-Markov Assumptions (for cross sectional survey data)

MLR1: Linear in parameters
The model can be written as in equation *a* above
MLR2: Random sampling
We have a random sample of n observations
MLR3: No perfect collinearity
No variables in the sample are constant and there is no exact linear relationship between independent variables
MLR4: Zero conditional mean
The error term has an expected value of zero, given any values of y
MLR5: Homoskedasticity
The variance of the error term does not vary given any value of x
Source: Adapted from Wooldridge, 2006

Table 1. Fertility Intentions as Measured in Cross- Sectional[5] National Surveys

Data Source	Question	Answer Categories
National Survey of Family Growth (1973; 1976; 1982; 1988; 1995; 2002; 2006-2010; 2011-2013)	Looking to the future, do you intend to have (a/nother) baby at some time (after this pregnancy is over)?	Numeric (Yes; No; NR/DK)
	(Not counting your current pregnancy,) how many (more) babies do you intend to have?	Continuous/Scale Response
Demographic and Health Surveys (years vary by country)	Now I have some questions about the future. Would you like to have (a/another) child, or would you prefer not to have any (more) children?	Numeric (Have another child; No More; NR/DK)
	If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be? (women with living children)	Continuous/Scale Response
	If you could choose exactly the number of children to have in your whole life, how many would that be? (women with no living children)	Continuous/Scale Response
Eurobarometer (special edition on Childbearing Preferences and Family Issues in Europe) (2006)	And for you personally, what would be the ideal number of children you would like to have or would have liked to have had?	Continuous/Scale Response
	How many children do you (still) intend to have?	Continuous/Scale Response
	In your opinion, what is the ideal age for a woman to have her first child?	Continuous/Scale Response

[5] Fertility intentions are also measured in some panel studies such as the British Household Panel Survey (UK), the Generations & Gender Programme Survey (Europe) and the National Longitudinal Study of Youth (US) but these are outside the scope of this exam.

DPH Comprehensive Exam II
November 14, 2011
(Second Draft)

Doctoral Student in Public Health
CUNY, The Graduate Center & The CUNY School of Public Health
Fall 2011

Overall comments:

From LORNA – nice work! I think you are close to completion on the methodological pieces, and they hang together very nicely in this new format. Also your section on chronic stress is quite strong, with some minor exceptions. I would concentrate your efforts mostly on section 1, which still needs tightening of text and more synthesizing what is known/not known. Part of your challenge is that "nativity" as you have articulated it is a very broad "exposure" to explore….encompassing genetic/ethnicity differences, SES variability, a range of acculturation experiences, and vastly different prior lifecourse exposures. Coupled with the multiple outcomes being examined, you've got a complicated mission! But I think you are almost there. Take a look at our comments and contact us if you have any questions. Keep up the excellent work and pace!

From JENN-—very nice revision. I concur with Lorna's thoughts above concerning drawing out more of the take-home messages in section 1, and some additional small comments are in the text. Good work.

From HEIDI – I agree with both Jenn and Lorna above – very nice revision. Excellent job incorporating the previous round of comments. I do think that the first two sections could be tightened and shortened. I don't think you need to go into quite the level of detail that you currently do on individual study findings (it makes it harder for the reader to get the main points). I've made a few additional small changes in the document itself. Do be careful with looking at confounding within the context of interaction (see comments in that section). Excellent job!

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To be added in final draft: DAG/path diagram of person-environment transaction model and table summarizing chronic stress exposures measures

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Commented [LT1]: Minor formatting comment: Add right justified page numbers for your final submission.

Commented [CHC2]: HJ – I agree with Lorna, note if you program the headers in Word correctly, Word will do the page numbering for you automatically.

I. MATERNAL HEALTH OUTCOMES IN IMMIGRANT WOMEN

i. Literature review

a. *Introduction*

Over the past four decades, patterns of immigration have changed rapidly, with the most dramatic changes observed in female immigration. In 2006, 12.5% of the United States (US) population was foreign-born, but the foreign-born accounted for 44% of the growth in the US population (Hedderson 2010). The proportion of immigrants that are female is also increasing: in 2000, females accounted for 55% of all immigrants, a much higher proportion than in previous immigration waves. Immigrant women are also more diverse in type and region of origin than in the past. Female immigrants now include family-sponsored migrants, independent labor migrants, refugees and asylees, and undocumented migrants. Since the 1980s, immigration from Latin America and Asia has accounted for 85% of total female immigration (Zhou 2002). Related to that trend, the proportion of births to foreign-born women has grown steadily, from 15% in 1990 to 24% in 2004, a 60% change (Livingston 2010).

While the "immigrant paradox", a term that refers to favorable birth/infant outcomes among immigrant women despite high levels of socio-economic disadvantage, has been well studied, less is known about whether this pattern holds for maternal health (Braun 2011). This literature review focuses on maternal morbidities and mortality among immigrant women and differential outcomes between immigrant women and native-born women. The review concentrates on outcomes in immigrant women emigrating from less developed countries to more developed countries in the Western hemisphere (predominantly in North America). To provide a comprehensive epidemiological profile of immigrant women, the outcomes span three periods across the periconceptional continuum: the antepartum period, the peripartum period, and the postpartum period. The antepartum period covers the period from conception to birth. Adverse conditions and outcomes that arise in this period are closely linked to preconceptional health. The peripartum period covers a briefer period from immediately before labor until immediately after delivery. The postpartum period typically covers the period from delivery to 1-2 years after delivery. This review concentrates on four adverse outcomes that are relatively prevalent and/or

Commented [LT3]: From LORNA: Generally good introduction. Some minor edit suggestions.

Commented [LT4]: From LORNA: Minor….Suggest avoiding use of the term "the foreign-born", as may come across pejorative (like "the homeless, etc). Also – 44% of the growth when? Easy to give what was historical female contribution to immigrant waves?

severely compromise the health of mothers in the US: gestational diabetes mellitus (antepartum), maternal morbidity (peripartum), postpartum depression (postpartum), and maternal mortality (antepartum, peripartum and postpartum).

In addition to describing and evaluating the occurrence of these key outcomes among immigrant women and the risks associated with nativity status, this review highlights several common methodological challenges, including appropriate comparison groups, conceptualization of causal pathways, lack of necessary adjustment for confounding, and non-representative samples. Comparison groups are particularly important when examining differences between immigrant and native-born women. The literature is mainly divided between studies using all native-born women as the reference group to all foreign-born women and studies employing within stratum comparisons (e.g. comparing US-born Hispanic women to foreign-born Hispanic women, or more specifically, Mexican-born women to US-born women of Mexican descent). While the choice of comparison group depends partly on the research question, finer categorizations of immigrant women and within stratum comparisons might be most appropriate, especially when interested in the effects of the post-migration environment, such as the effects of acculturation (e.g. time since migration, language proficiency) and social support. Confounding, in general, is a particular concern in studies of the effects of nativity due to the social, economic, and obstetric differences between native-born and foreign-born women and their potentially strong effects on the outcomes reviewed here. Studies also differ in their conceptualization of covariates and potential causal pathways. Some authors envision key factors, such as socio-economic status, as confounders of the relationship between nativity and maternal health. Yet others characterize these same covariates (e.g. SES, social support) as intermediaries in the pathway from nativity to maternal health outcomes. While most studies treat obstetric-related risk factors (e.g. maternal age, parity, receipt of prenatal care) as confounders, there is less uniformity regarding social determinant risk factors. Lastly, non-representative samples are subject to selection biases and may not be representative of either foreign-born or native-born populations.

Commented [CHC5]: From HEIDI: I love this new section, think your intro reads very well – agree with Lorna's suggestion for re-ordering

Commented [LT6]: From LORNA: My thought here is that a re-ordering may make sense: (1) studies differ in conceptualization and pathways; (2) comparison groups; (3) confounding; (4) representative samples

b. *Gestational diabetes mellitus*

Gestational diabetes mellitus (GDM), defined as carbohydrate intolerance with onset or first diagnosis in pregnancy, is a growing concern in the US. The most recent national estimate of GDM is 3.7% (as of 2001 from the National Hospital Discharge Survey) and has increased across all racial and ethnic groups in the US in the past decade (Adams 2009s, Hedderson 2010). Gestational diabetes is linked to a 10-50% higher risk of maternal type-2 diabetes in the 5 years after birth and several poor birth outcomes, including macrosomnia and preterm birth. Risk of GDM is highest among older women (35 years and more), women with a low socio-economic status, Native-American women and women from Asia and the Middle East (Adams 2009).

A handful of studies have examined the prevalence of GDM among foreign-born women in the United States. Two studies have reported fairly consistent results among immigrant women in different regions of (?) the US. One study conducted among Kaiser Permanente participants in Northern California reported a prevalence of 8.5% among foreign-born women (Hedderson 2010). Another population-based study reported a similar prevalence of 7.5% among foreign-born women in New York City (Savitz 2008). Prevalence estimates among immigrant women in the US vary considerably by race/ethnicity and region/country of origin. For example, in a large, population-based study of US births, the prevalence of GDM was highest in Asian Indian women (6.5%) and lowest in Japanese women (1.9%) [Keiffer 1999]. Two other regional studies in the US found a similar pattern of highest prevalence among Asian Indian women and lowest prevalence among Japanese women (cite). A NYC population-based study was able to look at finer categorizations of country of birth for regions other than Asia and the Pacific Islands. The authors found the highest GDM prevalence among South Central Asian women (14.5%, includes Indian women who had a 11.9% prevalence). The lowest GDM prevalence was observed among Ecuadorean and Panamanian women (each 4.4%). It should be noted that within the East and (?) Southeast Asian foreign-born sub-group (6.4%), the authors could only estimate the prevalence in Chinese women (6.3%) due to small numbers in other nationalities including Japanese (Savitz 2008).

Commented [LT7]: From LORNA: I believe this section still needs more synthesizing, beginning with paragraph 2 – hard to see the forest. It might help to say something like in the US there has been one nationally representative study, 4 regionally representative studies, and a handful of non-representative ones…. The range of estimates for overall prevalence among FB women has been X% to X%. All studies have, however, identified variation in GD prevalence between foreign-born groups, and for the most part these country-specific estimates have been similar across studies…..

Commented [CHC8]: From Heidi, you have done a nice job being clearer about comparison groups and presenting associations adjusted for confounding. I agree with Lorna, that the final icing on the cake, will be to help the reader understand the take home messages and feel less like they are wading through the data. One approach may be to start paragraphs with summarizing sentences of patterns seen in studies. Substantiate these sentences with data from individual studies (although sometimes not all of the estimates themselves need to be presented), and summarizing at the end– it is still a bit hard in this section to glean the big picture.

Commented [LT9]: From LORNA: Was overall prevalence in this study similar to Hedderson and Savitz?

Commented [LT10]: From LORNA: Unclear

Due to the considerable variation in GDM prevalence by ethnicity/region of origin, most US studies have compared subgroups of foreign-born women to their native-born counterparts and thus report odds ratios for the nativity-GDM relationship stratified by ethnicity or region of origin (Savitz 2008, Hedderson 2010, Keiffer 1999, Chu 2009, Ramadhani). These studies have found general consistency: within strata of ethnicity, foreign-born women have higher risk of GDM than their US-born counterparts; and there is variation in the nativity-GDM relationship by ethnicity/region of origin. For example, adjusting for age, Braun and colleagues reported a 13% greater odds of GDM among Mexican-born women compared to US-born, Hispanic women in Colorado (it was unclear whether the women who identified as US-born Hispanics were of predominantly Mexican origin). After adjustment for education, the significance of the association was attenuated to the null (Braun 2011). Ramadhani and colleagues reported an odds ratio of 2.2 (95% CI 1.4-3.7) in foreign-born Hispanic women versus US-born Hispanic women adjusted for age, smoking and drinking status (Ramadhani 2011). Hedderson and colleagues found a 35% greater odds of GDM among foreign-born Mexican women compared to their US-born counterparts in a multivariable model adjusting for age, parity, education, maternal weight gain during pregnancy, and gestational age at weight assessment (Hedderson 2010). Another study found slightly higher odds among Central/South American and Puerto Rican foreign-born women [aOR (95% CI)=1.07(1.01-1.13) and 1.07(1.04-1.10) respectively], but a decreased odds among Mexican foreign-born women compared to their US-born counterparts, adjusted for age, prenatal care, education, marital status and parity (aOR=0.91, 95% CI 0.90-0.92) [Keiffer 1999]. A NYC population-based study found a significant increased risk, adjusted for age, parity, education, pre-pregnancy weight, and smoking, among foreign-born Puerto Rican, Dominican, Mexican and South American women compared to their US-born counterparts [aOR (95% CI)=1.2(1.1-1.2), 1.2(1.1-1.4), 1.5(1.2-1.9), and 1.7(1.7-2.0) respectively] [Savitz 2008].

Commented [LT11]: From LORNA: From what I can see, you address the impact of adjusting for education and other potential confounders in a later paragraph. Should you save this for later?

Studies comparing foreign-born and US-born women of African descent are less consistent. Studies that have adjusted for various demographic and obstetric factors, have reported 14% (aOR=1.14,

95% CI 1.12-1.16) and 80% (aOR=1.78, 95% CI 1.46-2.18) higher odds of GDM among foreign-born Black women compared to US-born counterparts (Keiffer 1999, Hedderson 2010). However, a national study comparing all foreign-born Black women to their US-born counterparts reported a decreased though non-significant odds of GDM adjusting for age and smoking/drinking status (aOR=0.8, 95% CI 0.2-1.8) [Ramadhani 2011]. Another study employed within region of origin comparisons and found that foreign-born non-Hispanic Caribbean women had a significantly higher adjusted odds of GDM than their US-born counterparts (aOR=1.4, 95% CI 1.2-1.6). Further disaggregation by national origin showed that foreign-born Haitian women had a higher adjusted odds of GDM (aOR=1.5, 95% CI 1.1-2.2), while foreign-born Jamaican women had a non-significant adjusted odds of GDM (aOR=1.1, 95% CI 0.8-1.5 respectively). Sub-Saharan African women had a non-significant increased adjusted odds of GDM compared to their US-born counterparts (aOR=1.6, 95% CI 0.8-3.1) [Savitz 2008].

Studies have also found considerable variation by country of origin amongst Asian and Pacific Islanders. Keiffer and colleagues' study of US births, found a higher odds of GDM in foreign-born Filipina and Indian women [aOR (95% CI)=1.1 (1.01-1.13), 1.3 (1.2-1.4) respectively] than their US-born counterparts (Keiffer 1999). Similarly, in a NYC population-based study, foreign-born Chinese, Filipina, and Indian women had greater odds of GDM [aOR (95% CI)=1.3 (1.1-1.5), 1.9 (1.2-2.8), 1.7 (1.2-2.2) respectively] than their US-born counterparts (Savitz 2008). Chu and colleagues found that with the exception of Japanese and Korean women, foreign-born Asian and Pacific Islander women (e.g. Chinese, Filipina, Indian, Korean, Pacific Islander, and other Asian) had higher age-adjusted rates of GDM than their US-born counterparts (p=0.05) [Chu 2009]. Another study reported similar results: foreign-born Indian, Chinese, and Filipina women had greater adjusted odds of GDM [aOR (95% CI)=1.84 (1.02-3.34), 1.51 (1.46-2.18), 1.78 (1.482.15)], while foreign-born Japanese and Korean women had a 60% and 50% decreased adjusted odds of GDM [aOR (95% CI)=0.63 (0.40, 1.00), 0.48 (0.25,0.92)] [Hedderson 2010].

Few studies have examined variability in known risk factors among immigrant and native-born women in the US or abroad. The few that have examined these associations have found that immigrant

Commented [LT12]: From LORNA: Again, this paragraph can be summarized more concisely. What is the pattern, moreso than what does each study find?

women have lower prevalence of traditional obstetric risk factors such as pre-pregnancy obesity? and pregnancy weight gain than US-born (Hedderson 2010, Ramadhani). However, researchers have noted that immigrant women are more likely to be older at the time of pregnancy than their US-born counterparts; older age is a strong risk factor for GDM. Three US studies found that adjustment for maternal age attenuated, but did not remove the association between nativity and GDM (Keiffer 1999, Hedderson 2010, Braun 2011). These findings suggest that maternal age only partially explains the difference in risk of GDM observed between many immigrant and US-born women. Two studies have shown that additional adjustment for socio-economic status, timing of prenatal care, and parity further attenuated (compared to age-adjusted model), but did *not* remove the association between nativity and GDM (Keiffer 1999, Hedderson 2010). However, the magnitude and significance of the associations after full adjustment differed by ethnicity (i.e. for some ethnicities, such as Cuban and Samoan, the significance of the association disappeared with full adjustment) [Keiffer 1999, Hedderson 2010]. In contrast, in a study of Hispanic women, adjustment for educational differences, removed the association between Mexican-born and US-born Hispanic women in Colorado (Braun 2011). These findings suggest that the relative contribution of demographic and obstetric differences differs by region of origin/ethnicity and underscore the importance of examining these associations stratified by region of origin/ethnicity. Only one study adjusted for BMI during pregnancy; this study found that further adjustment for anthropomorphic differences strengthened the association between nativity and GDM among some ethnic groups: non-Hispanic white, Black, Chinese, Indian, Filipina, Pacific Islander, and Mexican women (Hedderson 2010).

Conclusions: This review of GDM studies shows considerable variability in GDM risk both across racial/ethnic groups and regions of origin. Some immigrant subpopulations (e.g. South Asians and Filipinas) show consistently higher rates of GDM compared to their US-born counterparts, while a smaller subset of other subpopulations show lower rates (e.g. Japanese and Korean). The findings for some populations are inconclusive, as the magnitude and direction of the association within these subgroups varies widely from study to study (e.g. women of African decent and Mexicans). Differences

Commented [LT13]: From LORNA: Do you feel confident to make some partial summary statements? For example, is there a general patterns of higher GDM among foreign-born compared to US-born women? Do you think elevated levels among Latina women are perhaps more driven by SES than among Asian women? Do any factors consistently account for some of the observed differences?

in the risk of GDM among subgroups might be due to differences in time since migration or to differences in the prevalence of risk factors in the country of origin (Chu 2099). Other inconsistencies could arise from comparison group differences. While more in-depth studies that examine variation in risk factors are needed, some evidence suggests that the influence of traditional GDM risk factors, such as obesity and age, might vary between foreign-born and US-born women by region of origin. Traditional anthropomorphic risk factors seem to be less significant predictors of GDM risk among certain subgroups of immigrant women, most notably in Asian and Pacific Islanders (Chu 2009, Hedderson 2010). The extent to which innate genetic differences that affect glucose metabolism, migration-related selection factors, and post-migration acculturation-related factors affect risk of GDM in immigrant women is unknown. Furthermore, it is likely that these factors (particularly genetic and post-migration environmental factors) interact with one other. More studies are needed to identify the cause(s) of variation in GDM risk observed among subgroups of immigrant women.

Commented [JD14]: One explanation you haven't mentioned the life course/developmental hypotheses about early life programming predisposing those born in deprived environments to metabolic problems when they later encounter calorie-rich environment. See for example work by Chris Kuzawa, Mary Schooling…

c. *Maternal morbidity in the peripartum period*

A broad category, peripartum maternal morbidity encompasses numerous conditions that occur immediately before or after delivery, including preeclampsia, perineal lacerations, and placental disorders. The prevalence of peripartum morbidity varies by condition: the prevalence of immediate postpartum hemmorhage was 2.1% in 2001, while hospital-based prevalence estimates of perineal laceration ranged from 2.2-19.9% in the US (Adams 2009s). Only a few studies have examined maternal morbidities of the peripartum period among immigrant women and compared immigrant women to their native-born counterparts. Two studies have been conducted in the US and have reported similar results. In a retrospective cohort study of births at an inner-city hospital in Atlanta, foreign-born women had a nearly 2-fold higher risk of perineal laceration than US-born women (OR=1.7, 95% CI 1.7-1.8). When stratified by region of origin, all foreign-born subgroups had higher risks than US-born women; however, the association was strongest among foreign-born Asian and African women compared to all US-born women (RR=2.2, 95% CI 2.0-2.4 and RR=2.0, 95% CI 1.4-2.9). Foreign-born women also had slight and marginally significant increased risk of postpartum hemorrhage (RR=1.10, 95% CI 1.0-1.2). Stratification

Commented [LT15]: From LORNA: Perhaps a sentence about generally recognized risk factors for these conditions?

by region of origin revealed that only African foreign-born women had a statistically significant risk (no relative risk reported) compared to US-born women (Forna 2003). A population-based study of births in Washington State reported an increased risk of placenta previa and febrile illness among foreign-born Southeast Asian women compared to US-born, non-Hispanic white women. Specifically, foreign-born Cambodian and Vietnamese women had 70% (OR=1.71, 95% CI 1.19-2.44) and 100% (OR=2.06, 95% CI 1.65-2.58) greater risks of placenta previa compared to US-born white women. They also had a 45% (aOR=1.45, 95% CI 1.10-1.91) and 100% (aOR=2.02, 95% CI 1.73-2.37) greater risk of febrile illness, adjusted for gestational age, birth weight, and method of delivery (Cripe 2011).

One Canadian, population-based retrospective cohort study examined the relationship between recent immigration and maternal placental syndrome, defined as preeclampsia/eclamspsia, placental abruption or placental infarction at the index delivery. The reference group included those residing in Ontario for more than 5 years, which included both women born in Ontario and those who immigrated more than 5 years prior to delivery. The authors found a progressively lower adjusted risk of placental syndrome associated with recent immigration in models adjusted for age, income, pre-existing hypertension, diabetes, multiple gestation, and receipt of prenatal ultrasonography at 12-24 weeks gestation. For example, those who immigrated 3 months prior to delivery had an 89% decreased adjusted risk of placental syndrome, with the risk rising in a graded manner with longer time since migration. More recent immigrants in this study also had lower rates of independent risk factors for placental syndrome, such as of obesity and hypertension, than longer residing immigrants and native-born women. The graded effect of duration was also observed within strata of income, suggesting that socio-economic factors did not fully explain risk associated with duration (Ray 2007).

Conclusions: Far from definitive, the limited body of US-based literature is suggestive of an increased risk of maternal morbidity among foreign-born vs. US-born women. Risk of peripartum morbidity seems to be strongest among women from Africa and Asia. However, an important limitation exists within the US studies: lack of adjustment for potential confounders. At a bare minimum, these studies should adjust for differences in age and parity (two maternal characteristics associated with both

Commented [JD16]: What were the hypothesized reasons for this?

Commented [LT17]: From LORNA: Any comment on why?

peripartum morbidity and nativity). Residual confounding by other maternal obstetric risk factors, such as small pelvic size, genital cutting, and history of prior maternal morbidities (e.g. GDM) might have also led to biased estimates. Notably, the comparison groups used in the two US studies were US-born women and US-born white women. These comparison groups might be useful in ranking the peripartum risk of subpopulations. On the other hand, such comparisons have limited utility for addressing questions about the role of acculturation or adaptation in the post-migration environment. Acculturation-related factors, particularly language preference and proficiency, might be a fruitful avenue for future research. Communication barriers specifically in the second stage of labor might result in prolonged labor leading to greater risk of hemorrhage and laceration (Forna 2003). The Canadian study suggests deteriorating health with increasing duration of residence. However, the study might not be generalizable to the US context, in which differences in access to prenatal care and migration-related selection might have different impact on findings.

Commented [JD18]: These seem like mediators rather than confounders to me—thus not leading to "bias" but explanation.

d. *Postpartum depression*

Commented [LT19]: From LORNA: This section is also a bit hard to weed out the patterns. One suggestion might be to start with the consistent Canadian study results, and then move into the less consistent US-based results. I would also encourage you to highlight/call out the better designed studies, so the reader knows when you are placing more clout in certain studies over others.

When you put the literature all together, would it be fair to say that there is a consistent pattern of elevated risk for postpartum depression in certain FB subgroups?

Postpartum depression, a clinical depressive condition that can affect women up to a year after delivery, is the most common complication of childbearing (Wisner 2002). Mothers with a history of postpartum depression are at risk for a number of poor health and social outcomes, including, recurrent episodes of depression either related or not related to childbirth (Miller), family discord and loss of income (Wisner 2002). Ten to fifteen percent of new mothers in the US develop symptoms indicative of depression in the postpartum period (CDC, year?). Prevalence estimates of depressive symptomatology among immigrant women range from 8% to 38% (Goyal 2006, Miranda 2005, Bjerke 2008, Ahmed 2008, Stewart 2008, Zelkowitz 2008, Mechakra-Tahiri 2007, Sword 2006, Huang 2007, Ganan 2011, Lansakara 2009). Most studies in the US and other developed Western nations have found higher levels of postpartum depression among immigrant women than native-born women (Goyal 2006, Bjerke, Ahmed 2008, Stewart 2008, Zelkowitz 2008, Mechakra-Tahiri 2007, Sword 2006, Ganan 2011, Lansakara 2009). However, studies which have examined the association between nativity and postpartum depression across racial/ethnic strata have found variable results (Huang 2007, Foss 2004). Comparison across

studies is complicated by a number of methodological issues, some of which are similar to those identified in the earlier gestational diabetes section. Many studies do not use representative samples. Even when representative samples are employed, sparse cell bias may occur especially when immigrant and native-born women are disaggregated by race/ethnicity. Risk of residual confounding due to differences in socio-economic status and the amount and quality of social support is also a consistent issue , and adjustment for these factors varies widely from study to study.

Most US-based studies lack either direct (Diaz 2007, Goyal 2006, Miranda 2005) or adjusted comparisons between immigrant and native-born women (Foss 2004, Huang 2007). One nationally representative study in the US used a population-based sample, and found that US-born women had a slightly higher level of any depressive symptomatology (i.e. mild, moderate and severe symptoms) than foreign-born women: 42.0% (95% CI 40.0-44.0) in US-born women vs. 36.1% (95% CI 32.7-39.5) in foreign-born women. US-born women had a significantly higher level of depressive symptomatology within Black, White, Hispanic groups but not Asian and Pacific Islanders. Foreign-born Asian women had a higher level of depressive symptomatology than US-born Asian women: 41.2% (95% CI 37.5-44.9) in foreign-born vs. 32.3% (95%19.5-45.1) in US-born. Foreign-born Pacific Islander women had a higher level of depressive symptomatology than US-born Pacific Islander women: 51.0% (95% CI 20.4-79.8) in foreign-born vs. 32.5% (95% CI 7.8-57.2) in US-born. These studies involved small sample sizesfor Asian and Pacific Islanders limiting their power to detect differences in these subpopulations. In contrast, Hispanic and Black foreign-born mothers had a slightly lower prevalence of depressive symptoms than their US-counterparts despite greater rates of poverty. The authors noted that greater social support and lower rates of teenage birth among foreign-born, Hispanic and Black mothers might counter the harmful effects of socio-economic strain (Huang 2007).

In another non-population-based US study, the authors directly compared US-born women of any race/ethnicity to three groups of foreign-born women (Vietnamese, Congolese, and Hmong) and examined the relationship between depression and infant development. All three groups share a history of social violence and colonization in which Western concepts were introduced and have large refugee

Commented [JD20]: Confounding?

Commented [LT21]: From LORNA: Unclear

populations in the US. Using the depression subscale of the Hopkins Symptoms Checklist-25, the study found higher mean scores of distress in Congolese (2.15) and Hmong (1.44) women than US-born women (1.35). The mean score for Congolese women was indicative of clinical depression, while the mean scores for Hmong and US-born women was below the cut-off score for preclinical distress (1.75). Vietnamese women (1.32) had a mean score comparable to that of US-born women (Foss 2004).

Commented [LT22]: From LORNA: I think you can summarize this more clearly. Only the Congolese women had mean scores above the cut-of for preclinical distress...

Two well-designed studies conducted in Canada found considerable differences between foreign- and Canadian-born women. One population-based study of postpartum depressive symptoms reported that 25% of immigrants from minority groups (i.e. born in a country outside of Europe or outside of a country with major English ancestry) vs. 11% of Canadian-born women and 8.3% of immigrant women from majority groups (i.e. born in Europe and other country with major English ancestry) experienced high levels of depressive symptoms on the Center for Epidemiologic Studies Depression Scale (CES-D) (Mechakra-Tahiri 2007). A similar Canadian study examined postpartum depressive symptoms using the Edinburgh Postnatal Depression Scale (EPDS) in various subgroups of immigrant women (categorized by entry status-refugee, political asylum seeker and non-refugee) and Canadian-born women. This study found elevated levels of depressive symptoms among non-refugee immigrant women (35%), asylum seekers (31%) and refugees (26%) compared to Canadian-born women (8%). After adjusting for prenatal care and visible minority status, immigrant women still had a 4-fold greater odds of having postpartum depressive symptoms compared to Canadian-born women (Stewart 2008).

While these studies suggest higher incidence of postpartum depression among certain sub-groups of (?) foreign-born women compared to their native-born counterparts, few studies have examined variability in risk factors to help elucidate potential causes behind these patterns and adjust for potential confounding. One of the Canadian studies described above found a significant inverse association between self-rated health and postpartum depression symptoms among Canadian-born women in a multivariable analysis adjusting for income and education, but not among immigrant groups. Immigrant women from minority-status groups had a higher probability of depressive symptoms regardless of their self-rated health. The authors concluded that Canadian-born women might be more likely to incorporate

mental health into their conceptualization of general health than immigrant women (Mechakra-Tahiri 2007).

A recent cross-sectional analysis of a sample of pregnant women from a cohort study conducted in Canada found higher prevalence odds of depressive symptoms in foreign-born than Canadian-born women independent of length of stay in Canada. The authors were interested in the potential mediating roles of socio-economic and social support in the relationship between length of stay and postpartum depression. The authors found that after adjusting for socioeconomic factors, such as education, language at home, and lack of money, differences in odds of depressive symptoms between foreign-born and Canadian-born women were attenuated. The association between immigration status and depressive symptoms was further attenuated after adjusting for social support (measured as partnership status, number of people who can help, and number of people to talk to). In their final multivariable model, intermediate-term immigrants (i.e. 3-8 years residing in Canada) had a 6% greater odds (aOR=1.06, 95% CI 0.79-1.22) of depressive symptoms than Canadian-born women compared to 35% greater odds (aOR=1.35, 95% CI 1.03-1.77) in the model with socioeconomic factors and 61% greater odds (OR=1.61, 95% CI 1.28-2.03) in the unadjusted model. Similar attenuation was found across models for recent (fewer than 2 years) and long-term (9 or more years) immigrants. However, the magnitude of the attenuation after adjusting for socio-economic status was greatest among long-term immigrants, whereas attenuation was greatest among recent immigrants after further adjusting for social support (Miszkurka 2010).

These results suggest that differences in the occurrence of depressive symptoms by nativity status may be related to differences in social support and socio-economic status, but patterns are difficult to confirm due to demonstrated variability by region/ethnicity and a limited body of studies. Socio-economic status seems to have a greater influence among longer-term immigrants, while social support seems to have a greater influence among shorter-term immigrants. Socio-economic difficulties may persist and become exacerbated many years after arrival (Miszkurka 2010). Social support, on the other hand, might be a particularly salient risk factor for depression among recently migrating women who have

Commented [LT23]: From LORNA: Can you say anything about the US probability study – did adjustments for potential confounders reduce the observed associations – which ones?

Commented [JD24]: So this implies that immigrant women had LOWER social support? Is this typical? I was under the impression at least with Hispanics that it went the other way.

Commented [LT25]: From LORNA: You can probably synthesize this more concisely – instead of telling the pattern, then describing the data, try combining. Makes for less repetitive reading.

experienced recent disruptions in their social networks and might not have had the time or resources to reform new ties in their host countries.

A handful of studies have examined acculturation factors (e.g. language, duration of residence) and postpartum depression. In general, these studies have not found a consistent relationship between various measures of acculturation and higher levels of depression. Studies conducted in the US have focused exclusively on the Latina population. One study using a convenience sample of pregnant and postpartum Latinas from public clinics in San Antonio, Texas, found that US-nativity and English preference were associated with elevated levels of depressive symptoms using the EPDS in bivariable analysis (Davila 2009). Another US study using a validated acculturation scale (the Short Acculturation Scale) found no significant relationship between acculturation status and postpartum depression (Beck 2005). It should be noted that although acculturation is a complex, multidimensional construct, studies to date have used crude measures of acculturation (even the validated scale was based solely on language preference). In addition, most studies examining acculturation lack adjustment for potentially confounding variables, such as socio-economic status and social support.

Conclusions: While a consistent pattern of higher risk among foreign-born women and specific subgroups of foreign-born women (e.g. minority status) emerged from a series of Canadian studies, the limited US literature is inconsistent and has several limitations. Similar comparative studies have not been conducted in the US and there is a need for studies that examine differences in traditional risk factors for postpartum depression between immigrant and US-born women. In particular, studies should examine whether or not variations in social support and SES might explain observed nativity-depression associations. In addition, acculturation-related factors are important as potential modifiers, and studies to date have been limited in their exploration of acculturation influences. Questions remain regarding the impact of different acculturation-related factors, such as age at migration, duration of residence, language preference, on depression in the postpartum period. In addition, the interplay between acculturation status and key social determinants (e.g. SES and social support) has not been studied in the US.

e. *Maternal mortality*

Commented [CHC26]: So do you think of social support as a mediator or an effect modifier?

Commented [LT27]: From LORNA: Are you prepared to say this based on one study? Perhaps qualify a little…?

Commented [LT28]: From LORNA: On what sample?

Commented [LT29]: From LORNA: Do you feel any ability to summarize differences across subgroups based on the limited literature?

Commented [LT30]: From LORNA: Unclear

Commented [LT31]: From LORNA: Do you mean well-established?

Commented [CHC32]: So these are mediators

Maternal mortality is rare in Western, developed countries, largely reflecting a high level of general health and adequate access to medical care (Adams 2009, Bollini 2010). Maternal deaths are sentinel events that are thought to correspond with maternal morbidity. Not only medically determined, maternal deaths are also related to larger social and economic conditions of the mother or group to which she belongs (Bollini 2010). Maternal deaths are classified as direct (resulting directly from the pregnancy) or indirect (resulting because pregnancy exacerbates a pre-existing condition or illness) [Adams 2009]. The US has one of the highest levels of maternal mortality among developed regions; in the US, the maternal mortality ratio was 15.1 per 100,000 live births in 2005 (Johnson 2011). Only two studies, to the best of my knowledge, have examined maternal mortality in immigrant women in the US, and comprehensive US-based studies of maternal mortality and nativity are lacking. One earlier report found a significantly higher mortality ratio amongst foreign-born Hispanic and Asian women compared to their US-born counterparts from 1991-1997. Specifically, foreign-born Hispanic women had a 50% greater pregnancy-related maternal mortality ratio than their US-born counterparts (11.8 v. 8.0 per 100,000 live births). Asian-Pacific Islanders had an 80% greater pregnancy-related maternal mortality ratio than their US-born counterparts (12.7 v 6.1 per 100,000). However, the authors noted that the US-born ratio for Asian-Pacific Islanders should be interpreted with caution due to instability of the estimate (fewer than 7 events occurred in this subgroup). Mortality ratios did not differ between foreign-born and US-born Black women (CDC MMWR 2001). Another hospital-based study in Georgia found a non-significantly, elevated risk of maternal mortality among foreign-born women compared to US-born women (RR=1.16, 95% CI 0.53-2.53). The wide confidence interval was due to the small number of maternal deaths that occurred from 1991-2001 (Forna 2003).

Commented [JD33]: I'm a little confused about the numbers here—the ratio would be comparing the rate in one group to another, correct, so comparing mortality ratios doesn't make sense to me?

Most studies that have focused on the immigrant subpopulation have been conducted in Europe. These studies have consistently found a pattern of higher mortality among immigrant women from less developed regions than native-born women. One of the earliest studies to document higher maternal mortality in immigrant women was conducted in England. Examining deaths from 1970-1985, Ibison and colleagues reported a 2-fold increased risk of maternal death among women born in Asia, and a 5-fold

increased risk among women born in Africa and the Caribbean, after adjusting for age and year of death, compared to their English born counterparts (Ibison 1996). Foreign-born and native-born women were similar in parity and social class; these factors likely did not explain differences in mortality between the two groups (Ibison 1996). In a more recent population-based, case-control study conducted in Spain, Luque-Fernandez and colleagues found that odds of maternal deaths was 87% greater among foreign-born women compared to Spanish women between 1999-2006, adjusted for age (95% CI 1.0-3.3). The attributable risk of maternal death due to foreign-born status was 45.3% (95% CI 2.0-88.8%) [Luque-Fernandez 2010]. A population-based, case-control study conducted in the Netherlands reported significantly elevated odds of death among non-Western immigrants, women from Surinam/Dutch Antilles, and other immigrants (from Africa and Asia). Non-western immigrants were two times as likely to have a maternal death (OR=2.1, 95% CI 1.6-2.7), and immigrants from Surinam/Dutch Antilles and other immigrant were approximately three times as likely to have a maternal death as Dutch-born women (OR=2.7, 95% CI 1.7-4.3 and OR=3.3, 95% CI 2.3-4.8 respectively) [Schutte 2009].

Another European study found that the relationship between maternal mortality and nativity status was not static through time. This population-based, case-control study conducted in Switzerland examined trends in maternal mortality among Swiss-born and foreign-born women over a nearly four-decade period, from 1969-2006. Bollini and colleagues (Bollini 2010) found that the risk of maternal death was 35% higher among foreign-born women compared to Swiss-born women overall (OR=1.3, 95% CI 1.0-1.8). However, the odds ratio varied over four time periods. In 1969-1979, the risk of maternal death was lower, though non-significant among foreign-born women. By 2000-2006, foreign-born women had a 4-fold increased risk of death compared to Swiss born women (OR=4.4, 95% CI 1.9-10.6). The maternal mortality rate dropped dramatically in Swiss-born women over the 4-decade period, with the greatest improvement observed from the 1970s period to the 1980s (MMR=19.2 in 1970s v. 5.8 in 1980s). In contrast, the rate among foreign-born women dropped from the 1970s to the 1980s, was stable in 1990s, and then rose in the first decade of the 21st century (Bollini 2010). Changes in the relationship between nativity and maternal death over the decades examined might stem from selection of

immigrants (e.g. more asylees entering in later decades who might have been exposed to various health-compromising events, more immigrants from less developed regions such as Eastern Europe, Africa, and Asia in later decades) or underreporting before 1970 due to a restrictive family re-unification policy that might have led to unregistered deaths (i.e. death was not registered in the Swiss vital records system). Due to restrictive policies, wives/partners residing in Switzerland were declared as visitors to avoid sanctions (visitor deaths not registered) (Bollini 2010).

Researchers have suggested that substandard care is a main determinant of differential mortality in immigrant and native-born women. One follow up study examining sub-standard care in the Netherlands was conducted on 101 direct maternal deaths. Refusing medical advice, delay in general practictioner's (GP's) recognition of symptoms, delay referral by GP, inadequate antenatal care by midwife were all more likely to occur among foreign-born than Dutch-born women (p <.05). For preeclampsia cases only, insufficient treatment of hypertension and seizures were more likely to occur in foreign-born than Dutch-born women (p=<.05 and <.01 respectively) [van Roosmalen 2002].

Conclusions: These findings from Europe suggest a consistent pattern of increased risk of maternal death in immigrant women compared to their native born counterparts. These findings are consistent across region of origin, and there is some evidence from specific countries that the increased risk among foreign-born women is growing (see Bollini 2010). Studies in the US are quite limited and small in sample size, although there is some evidence from a national sample that mortality may differ between US-born and foreign-born women within racial/ethnic strata. Maternal mortality is a rare event in developed regions. Two factors might be contributing to differential mortality between immigrant and native-born women: poorer health status of immigrants from developed regions and poor quality of care due to cultural incompetence, interpretation issues etc. There is some evidence that suggests that poor quality of care might be driving greater risk of death in foreign-born women in the Netherlands and in other European countries (van Rossmalen 2009). More studies are needed to determine which factors play a role in higher risk of maternal death among immigrant women in the US.

f. *Explanations/hypotheses of immigrant maternal health*

Commented [JD34]: Given all of these issues, are these trends really interpretable?

Commented [LT35]: From LORNA: Characterize direction

Commented [CHC36]: Insurance status?

Commented [LT37]: From LORNA: Good section. You might be able to speculate a bit on which of these factors may be playing particularly prominent roles in the health topics you examined (GD, PPD, MM, etc)

Researchers have offered various explanations for the observed relationships between nativity status and various maternal health outcomes explored in this literature review. Clearly, a complex set of factors determines maternal health outcomes in immigrant women. However, several overarching themes emerged in this review. These themes, briefly summarized below, are biological factors, health care access and quality of care, culturally-determined attitudes and practices in pregnancy/postpartum, and migration-related experiences, including pre- and post-migration factors and the adjustment process associated with migration.

Biological factors: Some researchers have suggested that biological and genetic factors may account for differences in maternal health outcomes observed in immigrant and native-born women. For example, in regards to peripartum morbidities, some have noted that larger placentas and prolonged labor due to smaller pelvis size among Asian women might contribute to the higher prevalence of certain morbidities such as perineal laceration (Cripe 2011). Researchers have also suggested a role for genetic factors specifically in regards to GDM (Braun 2011, Keiffer 1999, Hedderson 2010, Chu 2009, Ibison 1996). For example, the "thrifty gene hypothesis" posits that diabetic genotypes confer a survival advantage in times of famine by maximizing excess food energy, but increase the risk of obesity and diabetes in times of abundance (Chu 2009). Furthermore, malnutrition during fetal development results in impaired *beta*-cell functioning (important for glucose metabolism). Consequently, immigrant women from countries where under-nutrition is prevalent might be pre-programmed to develop GDM when exposed to food abundance and physical inactivity (Hedderson 2010). While biological factors may play a role in increasing susceptibility to certain maternal conditions, it is important to consider the combined effects of biological factors and the environment. For example, having a certain genotype, such as the thrifty genotype, does not, in and of itself, predict or explain disease. Instead, it is the interplay between the genotype and the environment (as well as health behaviors such as dietary changes) that might lead to disease. In addition, underlying genetic/biological factors cannot explain differences in outcome by region of origin (since women with shared ancestry are presumed to share similar genetic profiles).

Commented [JD38]: Yes, but the thrifty gene and developmental plasticity hypothesis are somewhat distinct—genes are fixed, but the fetal programming could apply to any genotype.

Health care access and quality of care: Immigrant women face numerous barriers to accessing appropriate and culturally competent health services. These barriers are related to income, legal immigration status, language, culture, and lack of interpretation services (Bollini 2010, Forna 2003, Lansakara 2009, Lara-Cinisimo). Not only do these barriers potentially prevent or delay immigrant women from obtaining health care, but they also impact the quality of care they receive when accessing services (Kramer 1999). Some studies in this literature review have documented cases of substandard care, particularly in obstetric care during or immediately after delivery. Interestingly, the authors asserted that language and communication difficulties, social distance and isolation could all affect the substandard care observed among immigrant women (Schutte 2009, van Roosmalen 2002).

Culturally-determined attitudes and practices in pregnancy/postpartum: Cultural attitudes and practices have special importance during pregnancy and the postpartum period (Collins, Griorgardis 2007, Fung 2010). Researchers have suggested that the disruption of postpartum rituals (i.e. practices and beliefs surrounding childbirth and the postpartum period) and the related disruption of relationships with key family members who are important sources of support, guidance and knowledge in the postpartum period, during and after migration might put immigrant women in a particularly vulnerable state (Griorgardis 2007, Morrow). Immigrant women might also be expected to carry out traditional practices even in the absence of necessary social support from family and community members who share common beliefs and practices, which might create greater strain for new mothers (Griorgardis 2007). Furthermore, expectations around motherhood may differ between the native and host country; thus, immigrant women may experience unfamiliar and culturally incongruent standards and norms (Morrow).

Migration-related factors, including acculturative stress: Immigration and childbearing are interconnected processes. Immigrant women tend to have high rates of childbearing after immigration (Parrado 2011). Migration related factors include pre-migration factors, post-migration factors and the impact of economic, social, and cultural changes associated with immigration (Edberg 2010). Examples of pre-migration factors affecting the morbidities and mortality discussed in this review include trauma in the country of origin stemming from experiences of war and socio-political upheaval (Fung 2010), female-

Commented [LT39]: From LORNA: Need to integrate better. Are these pathways through which immigrant women receive substandard care?

Probably helpful to specify in this section that you are speaking about access to care during and after pregnancy in new country of origin, correct?

Commented [JD40]: Year?

genital cutting (Forna 2003, Bollini 2010), and the health status in the country of origin (e.g. malnutrition, diabetes) [Chu 2009]. Trauma from violence and social upheaval might predispose immigrant women to mental health issues (Fung 2010). One study found an association between pre-migration stress and depression occurring in the postpartum period but not the prenatal period (Zelkowitz 2008). In terms of female genital cutting, authors have suggested that higher rates of 4th-degreee perineal laceration and postpartum hemorrhage might occur among women with scarring and obstruction from female genital cutting (Forna 2003). Finally, endemic malnourishment or other poor nutrition patterns in sending countries might lead to higher prevalence of GDM among some immigrant groups (Braun 2011, Keiffer 1999).

Commented [LT41]: From LORNA: What about pre-pregnancy reproductive health in country of origin – STI, other infections, poor prior prenatal care or post natal care, HIV, family planning??

In addition, post-migration experiences often involve exposure to multiple stressors that might affect maternal health, such as language and cultural barriers, concerns over legal status, unemployment, homelessness, social isolation, lack of access to education and health care, separation from family and marital strain, and discrimination (Ceballos 2010, Fung 2010). Some immigrant women often experience overlapping life transitions migrating to a new and unfamiliar country and adjusting to life with a new infant. These dual transitions may produce high levels of stress, which is compounded when one does not speak English, has financial difficulties, faces discrimination and social isolation, or lacks familiarity with the host country's health care practices and delivery system (Foss 2004, Zelkowitz 2008, Fung 2010). Moreover, migration is associated with increases in physical inactivity, psychosocial stress, and changes in diet. These changes put additional stress on beta cells and might interact with metabolic susceptibility to diabetes (Hedderson 2010, Keiffer 1999).

The "healthy immigrant effect" and "acculturation paradox" are important explanations of immigrant health (Ray 2007, Edberg 2010, Kramer 1999, Ceballos 2010). The "healthy immigrant effect" refers to the generally better health status of immigrants who recently immigrate compared to US-born individuals. However, immigrants' health may deteriorate over time as immigrants adopt unhealthy behaviors and experience difficulties and barriers to health care; this deterioration in health is known as the "acculturation paradox" (Edberg 2010, Ceballos 2010). The "acculturation paradox" might account

for the relationship seen between time since immigration and maternal health outcomes, as observed by Ray and colleagues in their study of placental syndrome (Ray 2007). Another explanation of deteriorating health is selective return migration (i.e. healthier immigrants returning to their country of origin). As healthier immigrant return to their home country, the immigrant population remaining in the US has poorer health, which might account for the relationship between duration and poorer maternal outcomes. A recent simulation study found that acculturation had a greater effect on birth outcomes over longer durations, while the effect of selective return migration was greater at shorter duration (Ceballos 2011). It is not know whether these associations hold for maternal health outcomes.

ii. Limitations

Several notable limitations exist in this literature and cut across the maternal outcomes discussed in this review. One important limitation is the availability of data. Data on region or country of birth, entry date, age at migration, duration of residence, language proficiency, and other acculturation-related factors are not routinely collected. Consequently, their relationships (individually or collectively) to maternal health have been understudied (Cripe 2011). Due to considerable within-group variation, treating immigrant women as a homogeneous group is not warranted and can lead to the masking of important subgroup effects. Furthermore, acculturation factors might be important potential mediators/moderators of adverse outcomes, and multidimensional measures are needed to ensure adequate construct and content validity. Studies that have used one-dimensional measures are inclusive and hard to interpret. In addition, there has been little examination of pre-migration factors and their impact on maternal health. Only one study in this review examined pre-migration factors and its relationship to postpartum depressive symptomatology (Zelkowitz 2008). The pre-migration period might overlap with preconception/interconception periods: health status and social conditions during preconceptional and interconceptional periods have been recognized as having an equal role in determining maternal health outcomes. Lastly, there are three main limitations related to study design. First, bias from differential outcome ascertainment is a concern, particularly in the maternal mortality literature. For example, due to delays in the initiation of prenatal care, language barriers, and complex

Commented [JD42]: This isn't intuitive to me. In the broader Hispanic paradox literature, sick people go back to their home countries to die, but I realize this is a different age group.

Commented [LT43]: From LORNA: Clarify.....simulation study?

Commented [LT44]: From LORNA: Acknowledge potential lifecourse influences?

health systems, immigrant women's pregnancy status might not be known at the time of death. As a result, cause of death might be incorrectly classified as a non-maternal code (Bollini 2010). Second, an important methodological limitation is the predominance of non-random, convenience samples. With such designs, it is difficult to know the extent to which findings are representative for either native-born or immigrant women. Third, retrospective study designs are subject to recall bias. Recall in the postpartum period might be related to the birth experience: those with poorer birth experiences or outcomes might be more likely to report adverse exposure during pregnancy.

iii. Conclusions and future directions

In sum, this review has shown that across several conditions, some subgroups of immigrant women experience worse outcomes than their native-born counterparts. The evidence of poorer outcomes among immigrant women seems strongest for GDM; however, there is considerable variation by ethnicity and region of origin. On the other hand, the evidence from the US is not as consistent for postpartum depression. Studies on peripartum morbidity and maternal mortality among immigrants in the US are suggestive of worse outcomes, but inconclusive due to their small number and considerable methodological flaws. A consistent theme throughout the maternal health literature is heterogeneity in risk within immigrant women. This review clearly highlights the importance of differentiating immigrant women by country of birth, time since migration, and other factors that could potentially affect exposures and outcomes. Furthermore, the associations between nativity and various maternal health outcomes might not be static across time, as changes in immigration policy and the socio-political climate and population health in sending countries affect the demographic composition and health status of migrants entering the US. There is a need for richer and larger data sets that allow for stratification by important immigration-related factors.

A complex, constellation of contributing factors potentially affect maternal outcomes and differences in outcomes between immigrant and native-born women. Clearly, immigrants face multiple challenges during migration and in adjusting to life in a new country (Fung 2010). These myriad challenges might compromise their health specifically during the vulnerable period of pregnancy and

Commented [LT45]: From LORNA: I would consider re-ordering, so that the limitation specific to maternal mortality be last. Also, what about residual confounding?

Commented [LT46]: From LORNA: Nicely written first paragraph. Second paragraph is key to reminding reader why this is all is interesting and may need some re-writing. Consider possibly starting para #2 with the sharp contrast to birth outcome literature.

might interact with pre-existing biological susceptibility and psychosocial morbidities. Interestingly, the findings of this review are in sharp contrast to the better outcomes generally observed among infants born to immigrant mothers. However, it is important to note that the observed health advantage found in perinatal and other health outcomes among immigrants might be confounded by changes in immigration policy (e.g. stricter health requirements for entrants) and adverse non-genetic exposure (e.g. unhealthy American diet) [Ray 2007].

Commented [JD47]: Sorry to harp, but again doesn't seem like confounding to me but mechanism.

Lastly, a glaring gap in this literature is the absence of studies of maternal mortality among immigrant women from less developed regions conducted in the US. Since maternal mortality in developed nations is considered a barometer of the social and economic environment and the quality and responsiveness of the health care system, differential outcomes by nativity status are likely, as has been observed in several European studies. Research has documented well-known differences between immigrant and native-born women's access to health care and their social and economic resources and support, it is thus imperative to examine maternal mortality within immigrant groups and between immigrants and native-born residents in the US.

II. CHRONIC STRESS AND BIRTH OUTCOMES

i. Review of the literature

a. *Key concepts and definitions*

Commented [LT48]: From LORNA: Good.

Given the high prevalence of adverse birth outcomes, such as preterm birth (PTB), small for gestational (SGA) and low birth weight (LBW), and their potential impact on long-term health, contributing factors to these birth outcomes have received considerable attention. Psychosocial stress has been widely recognized as a potential risk factor for multiple adverse birth outcomes (Hobel 2008). Stress is a multidimensional construct that consists of three component parts: the stressor, appraisal of the stressor, and response to the stressor (Beydoun 2008, Harville 2009, Lobel 1994). In a general model outlining how stress leads to adverse health, stress is conceptualized as an imbalance between environmental demands (both acute and chronic) and individual resources (e.g. personality, financial conditions, social support). This imbalance leads to increased stress perception and maladaptive emotional response, such as anxiety and depression. In turn, maladaptive emotional response leads to behavior change and increased risk of adverse health events (Beydoun 2008, Lobel 1994). In this model, stress is viewed as a person-environment transaction (Harville 2009).

Initial studies of the impact of stress on birth outcomes, typically defined stress as stressful life events during pregnancy. However, there are a couple of disadvantages to this definition. The frequency of stressful life events in pregnancy is low and their effects cannot be easily disentangled from those of chronic stress (Hobel 2008, Chen 2011). Furthermore, chronic and daily stressors seem to be more predictive of poor health conditions than one-time, infrequent life events (Paarlberg 1995). For these reasons, in recent years, researchers have broadened their definitions of stress to include chronic stress. Chronic stress is measured by multiple exposures including anxiety and depression, household strain, daily hassles, pregnancy-related anxiety and intendedness, racism/discrimination, neighborhood context, and stress of acculturation (Chen 2011, Hobel 2008, Beydoun 2008). The proceeding literature review will focus on non-contextual stressors (e.g. daily hassles) as well as contextual stressors (e.g. racism).

b. *Theoretical models linking stress to poor birth outcomes*

Three models detailing the biological mechanisms by which stress affects birth outcomes predominate the literature: neuroendocrine response, immune suppression, and allostasis. One model describes neuroendocrine responses to stress as follows: external stressors trigger the release of corticotropin releasing hormone (CRH), frequently referred to as a mediator of stress response. CHR stimulates adreno-corticotropin hormone, which in turn stimulates cortisol production (Hobel 2008). Placental CHR gene expression is stimulated by maternal plasma cortisol and can regulate delivery late in pregnancy, while glucocorticoids seem to link prenatal stressors and birth weight and intrauterine growth (Bolten year?). In the second model, maternal stress may induce suppression of maternal immune function (Bolten). Impaired immunity may result in maternal infections, such as bacterial vaginosis, which can trigger early, spontaneous delivery (Beydoun 2008). The third, allostatic model posits that accumulation of stressors over the life course (i.e. lifelong chronic stress) impairs the body's physiological functioning. Allostatic load is assessed via biological markers of stressors and stress response over the life course. High allostatic load refers to a situation in which the body's response to stressors is no longer adaptive and negatively impacts somatic functioning over time. Normally, the body's release of cortisol shuts down the acute stress response; however, with chronic exposure, the stress response fails to shut down and blood cortisol levels are perpetually high. Chronic stressors, such as low socio-economic status, racism, and trauma, may all lead to high allostatic load and ultimately poor birth outcomes (Hobel 2008). Related to the allostatic load model, the weathering hypothesis posits that ongoing social and economic inequities (e.g. discrimination, residential segregation, life adversity) result in premature aging and deteriorating among Black women, leading to growing racial disparities in adulthood (Rich-Edwards 2005, Geronimus 1996). In this model, maternal age interacts with social and economic factors to produce poor perinatal outcomes amongst groups experiencing socio-economic inequities (Rich-Edwards 2005).

Commented [JD49]: Citations for allostatic load? McEwen should be here somewhere…

c. *The effects of chronic stress on preterm and low-weight birth*

Non-contextual chronic stress: Studies of non-contextual, chronic stress have employed a plethora of exposure measures? including household strain, perceived stress, lack of control in daily life, childhood

trauma, social support, and pregnancy anxiety. These studies are quite heterogeneous in terms of their conceptualization and operationalization of chronic stress, as well as in their sampling and analytic methods (see limitations section). Nevertheless, most of the studies show positive associations between measures of chronic stress and adverse birth outcomes; however, the effects of chronic stress are usually attenuated by adjustment for other pertinent factors (e.g. socio-demographic, obstetric).

Commented [LT50]: From LORNA: Partially? Fully?

Studies in the US using mostly low-income samples have found positive associations between chronic stress and adverse birth outcomes (Ghosh 2010, Bryant-Borders 2007). In a matched case-control study of live singleton births to women residing in Los Angeles, , high chronic stress was associated with a 46% increased odds of PTB (aOR=1.46 95% CI 1.11-1.92) in a multivariable analysis controlling for age, race/ethnicity, marital status, and paternal support. Although not the main chronic stress exposure, two measures of pregnancy-related anxiety, confidence in a normal birth and fear for the health of the baby, were also significantly associated with PTB in adjusted analyses (aOR=1.57, 95% CI 1.17-2.12 and aOR=1.67, 95% CI 1.30-2.14 respectively) [Ghosh 2010].

In the same study, Ghosh and colleagues found significant multiplicative interactions between nativity and chronic stress and between paternal support and chronic stress. Specifically, high levels of chronic stress were significantly associated with increased odds of PTB in US-born Latinas but a non-significant increased odds of PTB in immigrant Latinas (p=0.17 for the interaction term) [note: the authors did not present absolute values of PTB in US-born and foreign-born participants]. Similarly, among those reporting little to no support from the baby's father, high levels of chronic stress were associated with a significantly increased odds of PTB , while there was no significant increased risk of PTB associated with chronic stress among those with moderate to higher paternal support (p=0.14 for interaction term) [Ghosh 2010]. These findings suggest that there might be important subgroup differences in the relationship between chronic stress and adverse birth outcomes.

Commented [LT51]: From LORNA: Or residual unmeasured chronic stress in certain subgroups?

Another US study conducted with a longitudinal cohort of TANF participants in Illinois found positive associations with various chronic stressors and low-weight birth. Bryant-Borders and colleagues used a multi-dimensional measure of chronic stress, which they segmented into four components: 1)

external stressors: hardships in home environment, food insecurity, child with chronic illness, home crowding, unemployment, hardship obtaining medical care, stressful life events); 2) buffers of stress: social support, coping skills, community group involvement, church attendance; 3) enhancers of stress: depression, need for mental health treatment in past year, 4) perceived stress: economic hardship, self-rated health, neighborhood safety. In separate multivariable analyses adjusted for maternal age, food insecurity (OR=2.6, 95% CI 1.7-3.5), child with chronic illness (OR=3.1, 95% CI 2.3-4.0), unemployment (OR=3.7, 95% CI 2.7-4.7), and poor coping skills (OR=4.0, 95% CI 3.1-4.9) were all associated with LBW. These findings indicate that among a low-income sample of women, both chronic stressors and compromised coping skills (suggesting lack of stressor buffering) are associated with LBW (Bryant-Borders 2007).

Contextual chronic stress: More recently, examination of chronic stress has been extended to contextual factors, such as racism/discrimination and neighborhood safety and access to resources. Previous studies that have ignored context are limited because contextual factors may contribute to maternal adaptive responses to various stressors (Nkanash-Amankra). The few studies that have examined contextual, chronic stressors have found a *relatively* consistent pattern of positive associations with poor birth outcomes. In a seminal article on racial disparities in LBW, Geronimus used age as a proxy for chronic psychosocial stress (i.e. cumulative stress exposures over the life course) to explore the weathering hypothesis among Black and White Michigan women of reproductive age (15-34 years). Geronimus found that the size of excess LBW among Blacks compared to Whites was higher in the young and middle adulthood than it is in the teenage years (e.g. the LBW rate ratio of black/white women is 1.8 among teen and 2.9 among 30-34 year olds). Furthermore, the proportion of 'high-risk' pregnancies increased more steeply with age among black women than among white women. Regarding the second hypothesis, Geronimus found a more graded effect of age on birth weight among women of lower socio-economic status than higher socio-economic status (at the highest socio-economic status, there was no significant relationship between age and LBW). The findings suggests a differential relationship between age and birth weight among black and white women, largely due to differences in distributions of

Commented [LT52]: From LORNA: Unclear

preconceptional maternal health characteristics. At the same time, socio-economic disadvantage was strongly associated with the graded effect of age on birth weight among black women, indicating that economic difficulties related to social inequity may be related to adverse outcomes in this subgroup (Geronimus 1996). Together, the findings seem to suggest that there is a weathering effect, using advancing age as a proxy measure, on health among black women. However, similar studies have been conducted in New York and Chicago have found that the age-gradient in poor birth outcomes among Black women was related to differences in socio-economic risk factors (the Chicago study had found the strongest association) (Rich-Edwards 2010).

Commented [LT53]: From LORNA: Clarify better

In a more recent study, Parker-Dominguez and colleagues examined the roles of stress due to racism, general stress and pregnancy-related stress in racial disparities in birth weight among women with singleton pregnancies recruited from a large medical center in LA county. The authors used multiple measures of chronic stress, including racism, allowing for comparisons of the independent effects of various sub-components of chronic stress. Racism, the main exposure of interest, was measured as perceived personal and vicarious (i.e. through a close family member or friend) racism in childhood and adulthood. In a multivariable model controlling for medical risk, gestational age, recruitment site and parents' education level, perceived lifetime racism was marginally associated and childhood vicarious racism was strongly associated with birth weight. Neither general stress (measured as perceived stress and stressful life events during pregnancy), nor pregnancy-related stress (measures as anxiety about pregnancy and pregnancy intendedness) was independently associated with birth weight in this model. In multivariable models with race and racism product terms, none of the product terms (race x lifetime perceived racism, race x childhood vicarious perceived racism, and race x childhood direct perceived racism) were significant, when controlling for medical risk, gestational age, recruitment site and parents' education level (Parker-Dominguez 2003 2003). Interestingly, only childhood vicarious racism was independently associated with birth weight, underscoring the importance of considering the timing of exposure. Clearly, there may be sensitive periods in which the effect of racism might be more predictive of adverse health.

Chronic stress related to neighborhood context may also play an important role in adverse birth outcomes. Relatively few studies have focused on the neighborhood-related stressors (i.e. stressors that stem from the physical or social environment of a neighborhood). Neighborhood-related stress is commonly operationalized as group-level measures of socio-economic disadvantage, racial/ethnic composition and stratification, residential segregation, as well as disorder (e.g. crime), deterioration, and access to neighborhood resources (e.g. number of outdoor places for recreational activities) [Schempf 2009, Nkanash-Amankra 2010]. The few that have examined these relationships have found somewhat inconsistent results (Nkanash-Amankra 2010). For example, a multi-level study using South Carolina PRAMS and US Census data, examined whether neighborhood context (measured as % living in census tracts under the federal poverty line, racial composition, household crowding, and neighborhood education level for adults) modified the relationship between stressful life events and PTB and LBW. The authors found that neighborhood contextual factors were independently associated with PTB and LBW when controlling for maternal demographic characteristics; however, the significance of the effects of the neighborhood factors differed between the two outcomes. Neighborhood high poverty, predominantly African-American neighborhood, household crowding, and low neighborhood education level each were associated with LBW via mediation by the stressful life event domains, when controlling for maternal demographic covariates (age, income, race etc). Only predominantly African-American neighborhood and the lowest neighborhood education level were associated with PTB via stressors. For both LBW and PTB, the addition of stressful life event domains to models with maternal covariates strengthened the associations between the aforementioned neighborhood contextual factors and LBW/PTB. Lastly, neighborhood contextual factors modified the relationship between stressful life events and LBW/PTB: a significantly stronger association between maternal stress and adverse birth outcomes was observed among mothers living in less advantaged census tracts, pointing to a possible role through which social and other physical resources mitigate stressors within neighborhoods (Nkanash-Amankra 2010).

Another study conducted among a low-income sample of women delivering at one hospital in Baltimore, examined the relationship between neighborhood context (using a neighborhood risk index)

and birth weight and the potential mediating effects of psychosocial (social support, locus of control, chronic stress due to daily difficulties and demands during pregnancy), behavioral (substance use, timing of prenatal care) and biomedical (hypertension, infection, pre-pregnancy weight and weight gain) factors, when controlling for individual socio-demographic factors and residential mobility. The neighborhood risk index was developed through principal component analysis to identify distinct components of structural neighborhood disadvantage, and included racial and economic stratification, social disorder (violent crime rate per 1000 residents) and physical deterioration (% boarded up houses). In multilevel models, neighborhood risk was associated with LBW when controlling for individual socio-demographic factors (the base model): one SD increase in neighborhood risk was associated with 76-gram decrease in birth weight (p=0.01). When potential mediators were sequentially added to the base model, psychosocial factors reduced the effect of neighborhood risk by 12%, behavioral factors reduced the effect by another 30% (the association was no longer significant), and biomedical factors reduced the risk by another 10%. These findings might suggest that the neighborhood context is associated with birth weight, independent from the effects of individual socio-demographic factors, but that behavioral factors accounted for the largest proportion of observed neighborhood risk effect on birth weight. In contrast, psychosocial factors were not independently associated with neighborhood risk and their mediating effects on the neighborhood risk-birth weight relationship were relatively weak (Schempf 2009). This last finding could be due to imprecisely measured stress variables (Nkanash-Amankra 2010).

Commented [JD54]: Behavioral factors can also be influenced by psychosocial factors

In sum, both studies found independent effects when controlling for individual-level demographics; however, they were inconsistent on mediation by other types of stressors. One study identified acute stressors as potential mediators, and the other study found psychosocial stressors (e.g. social support, locus of control, daily hassles) to be only weakly mediating. The different stress definitions and measures (one study used acute stress measures and the other used chronic stress measures) could account for differences in mediation.

iii. Limitations

Commented [LT55]: From LORNA: Excellent section

Several limitations in the chronic stress and adverse birth outcomes literature exist. Chief among these limitations, due to its broad implications on comparability of studies, is heterogeneity in definitions and operationalization of chronic stress (Paarlberg 1995, Lobel 1994, Chen 2011, Hobel 2008). As one can glean from the review of the literature, numerous sub-components and different relationships between and among the sub-components of chronic stress are explored. While it is widely recognized and articulated that chronic stress is a multi-dimensional construct, in practice, most researchers either do not or are not able to examine multiple sub-components of the construct of stress. Specifically, few studies have utilized measures corresponding to the three main components of the stress model: stressors, appraisal, and response. Studies that employ single measures of specific sub-components of the stress model lack content validity. Within the literature, examination of external stressors seems be slightly more common than examination of perception/response to stressors (perhaps because these latter sub-components are not as well defined or easily measured). However, stressors cannot capture how individuals perceive or respond to stress (whether they use coping mechanisms, change behavior, experience depressed mood etc). In the general model of stress, appraisal and response are critical steps along the pathway to adverse health outcomes (see Appendix); they are intermediaries between the occurrence of external stressors and the ultimate change in health status or outcome. Another drawback of single measures is the inability to examine the relative contributions of specific stressors or sub-components of the stress model. Researchers also implicitly employ different definitions of chronicity. For some, chronic refers to the entire duration of pregnancy; for others, it refers to the life course from early childhood to adulthood.

Commented [LT56]: From LORNA: Which are most actionable?

The use of small and non-random samples is another limitation. Relatively few studies have used random or population based samples of mothers and infants; most use convenience sample drawn from highly selected populations from prenatal clinics and hospitals. In small samples, it is certainly harder to detect small associations. Residual confounding is a significant concern even when multivariable analysis and a sufficiently sized sample is used. Smoking, for example, is a strong risk factor for PTB, LBW, and SGA. Lack of adjustment for smoking could lead to spurious associations. On the other hand, some see

smoking and other health behaviors as mediators in the stress model; in this case, the extent to which smoking contributes to the association between stress and birth outcomes needs to be taken under consideration (Paarlberg 1995, Lobel 1994). Seldomly examined, weight gain and energy expenditure are two variables that could confound the relationship between stress and poor birth outcomes, particularly the relationship with LBW (Hobel 2008). Examination of the role of social support is also important in the study of effects of chronic stress because of the strong buffering effect of social network and type of support. Social support can reduce stress levels, facilitate the adoption of healthy behaviors, and provide materials and resources to the pregnant women (Hobel 2008). Social support may mediate or moderate the association between chronic stress and birth outcomes (depending on the underlying causal model).

Stress is certainly not a random exposure, as it is not evenly distributed within a population. Stressors, both chronic and acute, tend to concentrate in the most marginalized strata of the population (e.g. low socio-economic status and low social position). Subgroups within a population might have highly different probabilities of being exposed. Consequently, even when stressors are well measured, it is difficult to disentangle the effects of stress, including low-social support, from the effects of low social status and economic hardship. What types of study designs might help get around this?

Commented [JD57]: Yes-good.

Timing of exposure assessment is an important consideration in stress studies (Lobel 1994). Even though the studies reviewed here measured *chronic* stress, most assessed the exposure at one time point (i.e. cross-sectionally). Most did not employ repeated measures throughout pregnancy, and thus could not assess for changes in associations across time. Furthermore, one-time postpartum assessment can lead to recall bias. For example, women who have experienced an adverse birth outcome may be more likely to recall chronic stress and attribute it to the birth outcome (Lobel 1994). Differential recall can lead to differential misclassification of the exposure and consequently spurious positive associations between stress and poor birth outcomes (Lobel 1994).

iv. Conclusions and future directions

Ultimately, different methods and definitions/measures of stress make it difficult to digest these studies as one cohesive, comprehensive body of literature. Nevertheless, a pattern of positive associations

between chronic stress measures and poor birth outcomes is emerging. Both direct effects and effects through mediation by health-related behaviors such as smoking have been observed. The studies reviewed here had relatively consistent findings for non-contextual stress/stressors. Significant positive relationships between chronic stress and PTB/LBW were found for both general measures of chronic stress (i.e. perceived stress scores), as well as more specific dimensions for stress (e.g. food insecurity, unemployment). Studies that have employed multidimensional measures of chronic stress have the advantage of being able to disentangle the effects of various subcomponents of the stress construct. These studies have found that the strength of the association between stress and PTB/LBW differ among subcomponents. Most of the non-contextual stress studies used low-income samples. While restriction is one strategy for minimizing confounding by SES, it also limits generalizability to mixed income populations. Studies of contextual chronic stress suggest positive relationships between racism/discrimination and neighborhood context and poor birth outcomes, even after controlling for individual socio-demographic factors. The independence of the neighborhood contextual stressors was a major conclusion for both studies reviewed here. However, discussions of the independence of effects should be nuanced by the fact that neighborhood factors have to operate through individual level variables in order to impact individual-level health outcomes (Schempf 2009). Several questions remain. One question is whether the effects of non-contextual stress in the general population (with attention to potential confounding effects of SES, social support etc). Another question is whether the effects of chronic stress differ by outcome (PTB v. LBW), as has been shown in studies outside of the US. The effect of chronic stress differed between outcomes, in one study--the only study to examine both LBW and PTB simultaneously (Nkanash 2005, Paarlberg 1995).

Commented [JD58]: ?

Commented [JD59]: where?

Researchers must be explicit about their definitions and conceptualizations of chronic stress and mindful of the potential limits of the actual measures that are used to reflect the underlying construct. To achieve adequate construct and content validity, future studies should employ multiple measures of stress, preferably measures that tap into each of the sub-components of Lazarus' model of stressor, appraisal and response. Combining measures will allow for a more comprehensive and robust operationalization of the

construct of chronic stress (i.e. better construct validity) and ultimately for a more powerful test of the relationship between chronic stress and birth outcomes (Lobel 1994). Future studies should incorporate measures of social support and coping and test for potential mediation/effect modification by these variables.

There is also a need for more longitudinal studies and datasets (Paarlberg 1995) that can better establish temporal patterns in the relationships between stress exposures and outcomes. Furthermore, several studies have suggested that timing of stress exposures over the life course (Parker-Dominguez 2003) and across micro time scales (i.e. across pregnancy-see Pritchard 1999) are important. Longitudinal designs might allow for a more comprehensive examination of the effect of the timing of exposure. In addition to accumulation of stress, critical periods of stress should also be considered (e.g. stress in childhood might have a different impact on birth outcomes than stress during adulthood). A consideration of critical periods necessitates the collection of repeated measures of stress exposures over the life course.

Another key issue in the study of chronic stress and birth outcomes is the uneven distribution of the exposure in the population; propensity score methods might help to overcome some of issues with confounding and independence of stress exposure and other risk factors (e.g. socio-economic disadvantage). The propensity score is the probability of being exposed for a participant conditional on the participant's pre-exposure covariates. Propensity score methods correct imbalances between exposures groups that limit exchangeability and remove the association between exposure and confounder. Researchers can then make inferences about observed differences in outcomes, based on the assumption that differences are due to exposure alone (Oakes 2006). Since the covariates must predate the exposure, this method might be most applicable to studies of chronic stress during pregnancy.

I. GENERALIZED LINEAR MODEL FOR CATEGORICAL RESPONSE DATA

Commented [LT60]: From LORNA: Excellent rewrite! I have very few comments.

i. Description of method

a. *Overview*

Generalized linear models (GLMs) are a general class of models for observations that are independent. GLMs consist of three components: 1) the random component which identifies the response variable and defines its distribution (e.g. binomial); 2) the systematic component which identifies the explanatory variables (linear predictors); 3) the link function which specifies the function that links the random (the mean of the outcome's probability distribution) and systematic components (the linear predictors) (Preisser 1997, Agresti 2007). The selection of the type of GLM depends largely on the nature of the categorical response variable (e.g. ordered, binary, or an event count). The GLMs for categorical responses reviewed here include logistic regression, Poisson regression, and cumulative logit regression.

b. *Summary table of regression models for categorical response variables*

Model	Nature of outcome	Distribution	Link	Key Assumptions
Logistic	Log odds of a binary variable	Binomial	Logit	- Linear relationship between the log odds of the response and continuous explanatory variables (Fleiss 1986, Koch 1982) - Requires large sample for valid inferences
Poisson	Log mean of a count variable or log of the rate [mean/index of size (e.g. time, space)]	Poisson	Log	- The mean equals the variance - Requires large sample for valid inferences
Cumulative logit	Log odds of being at or below a certain category of the response variable for two different levels of the explanatory variable (when the explanatory variable is binary) (Hastie 1989).	Multinomial	Cumulative logit	- The same proportionality constant applies to each cumulative probability; log odds does not depend on response category (Agresti 2007, HOSMER 2000) - Requires large sample for valid inferences

c. *Testing the model assumptions*

Commented [LT61]: Do you want to comment on the large sample requirement here?

The models described above have several important assumptions that should be tested before or during model building. In general, if the assumptions are violated, estimates and standard errors might not be valid. In logistic regression, a key assumption is a linear relationship between the log odds of the response and continuous explanatory variables (Fleiss 1996, Koch 1982). This relationship can be examined visually by graphing the exposure and outcome (e.g. a scatter plot of the exposure on the x-axis and the outcome on the y-axis or a lowess plot of the smoothed logits). If there is a non-linear relationship between the exposure and outcome, then the explanatory variable should be transformed. For example,

say the exposure variable, age, is not linearly associated with GDM (i.e. the GDM risk is low-moderate at young age, decreases slightly in the early 20s, increases slowly in late 20s-early 30s and then increases more sharply in the mid-30s and beyond), age should be transformed. Common transformations are dichotomous (e.g. median split), polytomous (e.g. 5-year age groups), and quadratic forms (e.g. including age-squared). The AIC values corresponding to the models with each form of the exposure variable can be compared (with the lowest AIC value supporting the best fit for the model to the data). Alternatively, one could re-plot the exposure and outcome and examine the shape of the plot to check for normality.

A key assumption of the Poisson regression model is equality between the mean and the variance. However, frequently data vary more than if the Poisson distribution were truly applicable. Data that have larger variability than would be expected in a true Poisson distribution are overdispersed. In the presence of overdispersion, the standard errors for the parameter estimates are underestimated and the confidence intervals are overly narrow. Heterogeneity among observations is a common cause of overdispersion. Negative binomial regression can be applied in a situation in which the variance is greater than the mean. This model has an extra parameter for overdispersion and thus allows the variance to exceed the mean. (Agresti 2007). To test for overdispersion, one should calculate and compare the sample mean and variance at each level of the exposure variable (if categorical) [Agresti 2007]. Alternatively, one could apply a likelihood ratio test to a Poisson model and a negative binomial model, as follows: -2LL(poisson) -2LL (negative binomial), where LL=log likelihood. If the likelihood ratio test statistic is significant, then the null hypothesis (i.e. the mean=variance) can be rejected; the variance does exceed the mean and the negative binomial model should be used (Asmail 2007).

ii. Model building

A multiple regression model allows for the examination of the relationship between a response variable and more than one explanatory variable. In such a model, the parameter beta refers to the effect of the main explanatory variable on the log odds of the outcome occurring, holding constant the other explanatory variables in the model (Agresti 2007). Model building is a process that involves the selection

of covariates and assessment of the adequacy of the multivariable model in regards to its individual variables and its overall fit (Hosmer 2000).

There are two main issues in variable selection: how many covariates and which covariates to include in the model. There is a limit to the number of explanatory variables to include in any model. When data are unbalanced on the outcome (i.e. when there are very few observations with disease or with no disease), the number of explanatory variables that the model can estimate accurately is reduced. Consequently, the estimates might be biased and the standard errors poor (i.e. sparse data bias). As a general rule, there should be 10 observations for every covariate in the model (Agresti 2007).

Determining which variables to include in a model is central to model building. Variable selection should be guided by theory regarding the underlying causal model (shaped by the existing literature) as well as by statistical assessment. Therefore, one might include covariates that have been identified in the literature as potential risk factors for the outcome and believed to be associated with the exposure regardless of their statistical significance. This approach provides a more complete control of confounding compared to selecting based on significance alone (Hosmer 2000). Statistical assessment of the covariates should include bivariable analyses, in which the relationships between the covariate and exposure and the covariate and outcome are determined. Covariates that have a statistically significant relationship with the exposure in the source population and with the outcome among the unexposed, but which are not thought to be in the causal pathway nor a common effect of the exposure and the outcome, should be included in the model (this assessment approach adheres to Rothman definition of a confounder [Rothman 2008]). After variables have been selected and the multivariable model fitted, each covariate should be examined for its significance (i.e. confidence intervals and p-value for the Wald test) and the change in the estimated coefficients of the main exposure of interest and the covariate from the model with only that covariate to the multivariable model (i.e. comparing coefficients in the crude and multivariable models).

As an example, in a study of nativity and postpartum depression, bivariable analyses are performed as described above with all potential confounders (including age, socio-economic status,

race/ethnicity, parity, marital status, labor complications). Covariates for the multivariable model are selected that meet the confounder criteria described above, as well as any covariates known from the literature to be associated with postpartum depression. In this example, the bivariable analyses showed that age, socio-economic status, race/ethnicity and labor complications were significantly associated with both nativity status and postpartum depression at alpha-level of 0.05-these variables are selected for the multivariable model. In addition, marital status is selected based on subject knowledge (and to improve comparability with previous studies), even though it had a non-significant association with postpartum depression in the sample (Simons, unpublished data). Once the preliminary model has been fitted, one would examine the covariates more closely; covariates could be removed from the multivariable model if they are non-significant and/or if there is no appreciable change in the estimates from the crude to adjusted model (Hosmer 2000).

Commented [LT62]: From LORNA: Are you referring to the influence of a covariate on thwe exposure-outcome association here in particular?

Commented [CHC63]: Not sure I agree here, you might still include them in your model, depends on the context, also don't forget that you are looking to see if the covariates are highly correlated, as they may be measuring the same underlying construct, in which case you have to choose which measure you think is the better one to keep in your model. – Oops – I say this is in the next paragraph

An important issue that arises in model building is multicollinearity, which results when two or more explanatory variables that are correlated with each other are entered into the model. Multicollinearity can result in null associations between the explanatory variables and outcome because of the overlap with other explanatory variables in the model. It will also inflate the standard errors of parameter estimates (Agresti 2007); the confidence intervals will be wider and type II errors may result. To address multicollinearity, one should first confirm that there are no obvious errors (e.g. incorrect dummy coding). If the covariates are thought to tap into one underlying construct, then one might create a sum or scale from the covariates. Another option is to drop variables; one covariate might be chosen to represent the construct (Schroeder 1990). An example of a set of multicollinear variables is maternal education, paternal education, and household income. These variables are likely to be highly correlated with one another and reflect the larger construct of socio-economic status or social position. However, if there is evidence of multicollinearity (e.g. inflated standard errors, high correlation among the variables), one might choose one to represent the underlying construct of socio-economic status. Alternatively, one could create an index as Huang and colleagues did in their study of depressive symptomatology in US-born and immigrant women. Their index consisted of the three components: paternal

education/occupation, maternal education/occupation, and household income. The index was a 5-category ordinal variable (categories represented quintiles of the SES index) [Huang 2007].

Similarly, interaction terms add complexity to the model and can reduce precision and accuracy in the parameter and confidence interval estimates. In typical epidemiological studies, the power to detect interaction effects will be an order of magnitude less than the power to detect main effects. Consequently, there is more variance in interaction estimates than variance in estimates of main-effects alone. Larger study samples are necessary to study interaction effects (Greenland 1993). Greenlander has shown that failure to reject additive or multiplicative models (i.e. erroneously concluding that there is no additive or multiplicative interaction) is common in studies with small to moderate sized samples (Greenland 1983). In these cases, spare-data or exact methods, such as conditional maximum likelihood, should be used (Rothman 2008).

iii. Application to topical areas

As noted by Preisser and Koch, public health research is often concerned with the relationships between a categorical response and one or more explanatory variables. In a multi-causation framework, the importance of modeling that can accommodate multiple explanatory variables is apparent. Clearly, the outcomes examined in the previous topical sections-postpartum depression, gestational diabetes, peripartum maternal morbidity, maternal mortality, and key birth outcomes (e.g. preterm birth)-are thought to arise from a complex and dynamic constellation of potential causes. Not unexpectedly, much of research in these areas utilizes multiple-regression modeling to elucidate the multiple relationships between and among various risk factors and the periconceptual outcomes of interest. Second, most research studies in maternal and child health use observational designs. Observational studies are common in maternal and child health due to the logistical and ethical concerns surrounding randomization of exposures in pregnancy. Adjustment for inherent differences in comparison groups is especially important in observational studies that lack randomization (Koch 1982). Adjustment for confounding is a necessary component of maternal health research because of the strong effects of certain immutable maternal characteristics, such as parity and age at first birth, on maternal and infant health outcomes.

These maternal characteristics are usually not the main explanatory variables of interest and they introduce non-equivalence in comparison groups.

Commented [CHC64]: Nice work, Hannah, this section is much clearer now.

IV. ASSESSMENT OF INTERACTION/EFFECT MEASURE? MODIFICATION

Commented [LT65]: From LORNA: Very nice.

i. Definition of interaction/effect modification in epidemiology

Commented [LT66]: From LORNA: You might want to clarify to the reader somewhere why you are invoking both terms

Epidemiologists use the term effect modification to indicate a situation in which the association between an exposure and an outcome varies across different strata of a third exposure (VanderWeele and Robins 2007). In other words, exposures interact with one another when one modifies the effect the other has on the occurrence of disease (Thompson 1991). A key concept in interaction/effect modification is how the two exposures interact with one another. Qualitative effect measure modification refers to average causal effects in the strata of the third variable that are of opposite direction (e.g. in Z=1, the risk ratio is > 1.0; in Z=2, the risk ratio is < 1.0). When there is qualitative effect modification, multiplicative effect modification implies additive effect modification and vice versa. However, when there is quantitative effect modification (i.e. the average causal effects in both/each strata of the third variable are in the same direction), there can be effect modification on one scale but not the other. This phenomenon is called scale dependence; some authors prefer to use effect measure modification to highlight the dependence on the effect measure used (Hernan 2011, Rothman 2008).

Commented [CHC67]: In general, I like the term 'effect measure modification' over 'effect modification' as it suggests that it is related to the 'measure' itself which we know to be true – i.e. whether we are assessing on the multiplicative or additive scale

Commented [CHC68]: Ok – I see you put it here☺

There are two main concepts of interaction in epidemiology: statistical interaction and biologic interaction. Statistical interaction typically refers to the inclusion of a product term (main exposure x third variable) in a statistical regression model. Common criticisms of statistical interaction are that it is disconnected from the underlying causal models on the biological level and that it is completely dependent of the type of statistical model that one uses (i.e. a log-linear model could show no evidence of interaction, whereas the equivalent linear model could show evidence of interaction) [Greenland 1993]. Biologic interaction takes into account underlying causal effects (in contrast to statistical interaction which refers to association whether causal or not [Rothman 2008]). There are two related definitions of biologic (causal) interaction based on the sufficient component cause model and the counterfactual model. Biologic interaction within the sufficient cause framework refers to two component causes co-existing within a sufficient cause; the causes act together in the same causal mechanism and there is synergism between the two (VanderWeele 2007). Utilizing the counter-factual framework, there is interaction

between two treatments (or exposures in absence of randomization), A and E, if the causal effect of A on the outcome, Y, after a joint intervention that sets E to 1 is different from the causal effect of A on Y after a joint intervention that sets E to 0 (Hernan 2011).

ii. Assessment and measurement of interaction

Several methods for assessing interaction exist. Stratification is the natural, first step to identify interaction/effect measure modification. One examines the magnitude and direction of the association between the exposure and outcome in each level of the potential effect modifier (before adjusting for any potential confounders) (Hernan 2011). In multivariable analysis, the test for product term (main exposure x third variable) is a common method for assessing statistical interaction. The Wald-test tests whether the beta coefficient of the product term is statistically different from zero (if so, then there is evidence of interaction on either the multiplicative or additive scale depending on the type of regression model used). The likelihood ratio test assesses whether the fit of the model with the product term is significantly better than fit of the main effects model without the product term (Knol 2009).

In addition, several measures of additive risk within multiplicative models, such as logistic or Poisson, have been proposed: the relative excess risk due to interaction (RERI), attributable proportion due to interaction (AP), and the synergy index (SI). The RERI is calculated as the difference between the expected effects based on the addition of the individuals effects of the two exposures of interest and the observed effect in the joint exposure category (deJager 2011). If the effects of the exposures are monotonic (i.e. the exposures never prevent disease), a RERI >0 implies sufficient-cause interaction. If monotonicity cannot be assumed, a RERI >1 implies sufficient-cause interaction (VanderWeele 2007). Interpreted as the proportion of events that is due to interaction, the AP is calculated as RERI divided by risk ratio in the joint effect category. The SI is interpreted as the excess risk from exposure to both exposures when interaction is present relative to the risk from exposure when interaction is not present (deJager 2011). It is important that authors clearly indicate the assessment of additive and/or multiplicative interaction and the underlying scale of the model (e.g. log-linear vs. linear model).

iii. Additive vs. multiplicative interaction

Interaction can be assessed on an additive or multiplicative scale. For example, when the amount that the main exposure, X, multiplies the risk is less in one stratum of a third variable, Z, than in another, then there is said to be effect modification on the risk ratio scale (i.e. multiplicative scale). If the risk differences for the main exposure change across levels of a third variable, Z, then there is said to be effect modification on the risk difference scale (i.e. the additive scale); the combined effect of the main exposure, X, and the third variable, Z, on risk is greater/less than the risk computed by simply adding the separate risk differences for X and Z alone (Rothman 2008). Other measures of additive and multiplicative interaction utilize the risk ratio as follows: in an additive model, the amount of change in the main exposure, X, from x=1 to x=2, is measured by the amount that the change *adds* to the RR; in a multiplicative model, the amount of change in the main exposure, X, from x=1 to x=2, is measured by the amount that the change *multiplies* the RR (Greenland 1983).

Many believe that the additive model is of greater public health importance because of its ability to identify subgroups that would most benefit from intervention (Thompson 1991, Greenland 2007). Departures from additivity (i.e. non-additivity of the risk differences) indicate the group in which the greatest *absolute* risk reduction would occur, which may or may not be the group with the highest risk group (Greenland 2009). Similarly, many suggest that additive interaction is most aligned with biologic interaction. Non-additivity of risk differences implies the presence of interaction types-where we cannot say what the effect of one exposure would be without knowing the value of the other exposure-or causal interdependence (Rothman 2008, VanderWeele and Robins 2007).

iv. Recommendations and rationale for testing interaction

The assessment of interaction in epidemiology has stemmed significant debate regarding its appropriate application and reporting in research studies and the non-correspondence between concepts of statistical and biologic interaction. Nevertheless, it is important to test for statistical interaction because of its enhanced ability to detect effects and prediction of disease based on individuals' risk profiles, as well as its practical implications for targeting interventions (Thompson 1991). Sound techniques should be applied when testing for interaction. The following recommendations for detecting 2-way interaction are

Commented [LT69]: From LORNA: spawned?

presented: 1) stratification by the potential effect modifier; 2) building and comparison of a main effects model and a model with relevant interactions terms; 3) calculation of an additional measure of interaction such as the RERI with 95% CIs to test for additivity using effect measures from multiplicative models (e.g. logistic regression). Before beginning an assessment of interaction, it is important to have an a priori hypothesis about the underlying causal mechanisms involved and the expected direction of the difference in associations.

Commented [CHC70]: Important to note here, that this would be in the model already adjusting for confounding, and that you need to include interaction terms between the effect modifier and all potential confounders to also test whether confounding works the same way within each strata (those that are not significant can be dropped from your model – meaning confounding worked the same way across strata).

Stratification of the bivariable association allows for a brief examination of crude associations in levels of the potential effect modifier. Adjusted stratum-specific estimates should be compared to one another, with attention to both their magnitude and direction. Though stratification is an important first step, formal tests for interaction-the most appropriate statistical test for heterogeneity between or among subgroups-are necessary. The main effects model should be built including all relevant covariate including the potential effect modifier. A second interaction model should then be built with all relevant covariates and an interaction term between the exposure of interest and the effect modifier (i.e. the Wald-test for product term). The significance of the p-value should be assessed, using a p-value of <0.15 to indicate significant *multiplicative* interaction (i.e. deviations from multiplicativity). The likelihood ratio test may be used to compare the fit of the main effects and interaction models (i.e. to test the difference in log likelihood between the two models on their chi-square distributions). A significant p-value (< 0.05) for the likelihood ratio test would indicate that the interaction term is needed in the model. If interaction between the exposure and effect modifier is confirmed, then the results should be presented with a common reference group-the reference group being those not exposure to either factor (Kaufman 2009).

Commented [CHC71]: Here it's important to add that step of testing for interaction between your confounders and your effect modifier.

Lastly, *additive* interaction should also be tested because of its adherence to theories of causation and ability to identify subpopulations who would most benefit from intervention. A few additive tests for use in models with underlying multiplicative scales have been suggested-the most common being RERI and SI. The RERI has a major drawback when used in multiplicative models, such as logistic regression models: its calculation is only exact and valid for models that do not include other variables over which the RERI might vary (Knol 2009, VanderWeele 2009). Anticipating that my future analyses will include

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adjustment for multiple confounders, SI for additivity is the best choice as it is more resistant to variation over confounders (Knol 2009, deJager 2011). A SI of 1.0 would indicate no departures from additivity (in practice, a 95% CI would be calculated and if 1.0 were within the interval, the null hypothesis of non-additivity would be accepted) [deJager 2011].

v. Application to topical areas

Assessment of interaction is an important component of a comprehensive analysis of both nativity and maternal health outcomes and chronic stress and birth outcomes. As Geronimus points out, risk factors may not operate in the same way across sub-populations (Geronimus 1996). In terms of maternal health outcomes in immigrant women, subgroup differences are expected due to the considerable heterogeneity among immigrant women. For example, in Chu and colleagues' study of gestational diabetes among Asian Pacific Islanders, country of origin modified the relationship between nativity and diabetes; in women of Japanese/Korean ancestry, US-born status conferred an increased risk of gestational diabetes, while in every other Asian nationality examined, US-born status conferred a decreased risk of gestational diabetes (Chu 2009). In addition to country of origin, time since migration is another important potential effect modifier of the relationship between nativity and birth outcomes. Researchers have suggested that not accounting for time since migration can mask disparities in outcomes between immigrant and native-born women (the average effect) and between subgroups of immigrants by time since immigration (Uroquia 2010). Within the maternal stress and birth outcomes literature, researchers have suggested that timing and chronicity of stress impacts the magnitude of the association between stress and birth outcomes. For example, stressors that occur before or early in pregnancy might have stronger effects on birth outcomes then stressors that arise later in pregnancy (Cammock 2011). Another potential interaction is between stress and social support, with social support modifying the association between stress and birth outcomes (Ghosh 2010). It is important that both factors' independent and joint effects are examined in studies of birth outcomes. Lastly, as noted previously, a main strength in interaction assessment is its application to targeting of interventions. However, few studies in the topical areas have assessed additive interaction.

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Whether, When, and How: Fertility Intentions and Age in the U.S.

Second Exam
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Introduction

How individuals think about and plan for having children is of interest to researchers from diverse disciplines. For example, intentions about the timing of children and desired number of children may have important implications for population projections (Demography), for population health (Public Health), labor force participation (Economics), and use of social welfare (Public Policy). In Public Health, these intentions, particularly around the timing of children, have important health implications both for individuals and for the population as a whole. As women delay their first birth they may experience difficulty achieving pregnancy and carrying to term, they may have more complicated pregnancies due to "advanced maternal age" which may require more intensive and expensive medical interventions, and they may turn to assistance from infertility treatments in getting pregnant such as in-vitro fertilization, which may have health effects for both the mother and child. This paper will examine the interplay between fertility intentions and age, with a particular eye towards women of "advanced maternal age" and whether and how fertility intentions change as women age and reproductive technologies become more common and sophisticated. This paper will also examine fertility intentions at both the population and individual levels.

Understanding Fertility Intentions

Fertility intentions[a] are future plans regarding having or adopting children. These are frequently operationalized as the desire to have children and intended number of children (family size) and are commonly examined in social science research. They are less frequently operationalized to look at timing of pregnancy, such as ideal age to have a child.[1] Fertility intentions may be hypothetical and are distinctly different from pregnancy intentions, which focus on outcomes of pregnancies after the pregnancy has occurred.[2]

Theory Behind Fertility Intentions

Theory of Reasoned Action

Research on the meaning and implications of fertility intentions draws on the Theory of Reasoned Action[3,4] (See Figure 1) and the Theory of Planned Behavior (see Figure 2). In both of these models, individual intentions are central to performing a behavior. In the Theory of

[a]Although here I use the term intentions when referring to whether and how many children a respondent wants, Hagewen and Morgan note that respondents in nationally representative surveys do not typically differentiate between intended and expected when asked about their fertility intentions.[10]

Reasoned Action (Figure 1) intentions are a precursor to performing a behavior and are influenced by attitudes about that behavior and subjective norms surrounding the behavior. In this model behaviors also "feedback" into attitudes and norms, creating a cycle in which these intentions and behaviors exist. According to Ajzen and Fishbein (1975) intentions involve four elements: the behavior, the target at which the behavior is directed, the situation in which the behavior is to be performed, and the time at which the behavior is to be performed.[3] In early work on the Theory of Reasoned Action[5] (and noted in Rindfuss et al 1988[6]) they note that attitudes and behaviors are strongly related when the following criteria are met: the relative action is unambiguous, and the target, context, and time of the action are specified. [5,6]

Theory of Planned Behavior

The Theory of Reasoned Action was later refined in the development of the Theory of Planned Behavior (Figure 2). In discussion of the Theory of Planned Behavior, Ajzen states that intentions are "indicators of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior".[7] Intentions are positively related to the likelihood of performing that behavior, and stronger intentions are associated with increased likelihood.[7] However, as Ajzen and Fishbein[3,4] and Ajzen[7] note, intentions lead to behavior only when the behavior is able to be controlled by the individual and the required opportunities and resources are available for the individual to succeed.[3,4,7] In other words, actual behavior is a function of intentions and what Fishbein and Ajzen call "perceived behavioral control," or how much internal control an individual feels she/he has over the behavior.[3,4] In the Theory of Planned Behavior subjective norms also exert an influence on behavior. Ajzen (1991) defines subjective norms as "perceived social pressure to perform or not to perform the behavior" and suggests that a favorable attitude toward the behavior, favorable norms with respect to the behavior, and a high level of perceived behavioral control lead to a greater likelihood that the individual will perform the behavior. [7]

Theory of Planned Behavior Applied to Fertility Intentions

Many of the components in the Theory of Planned Behavior map nicely with factors examined in fertility intentions research. For example, subjective norms around child bearing, particularly the timing of first child and family size, are an important consideration in thinking about fertility intentions, and behavior and norms around child bearing are frequently studied in tandem with intentions. Ajzen and Klobas (2013) have applied the Theory of Planned Behavior to fertility

intentions (Figure 3) to aid in our understanding of how intentions lead to fertility outcomes.[8] In this model, attitudes towards having children, subjective norms around having children, and perceived control operate synergistically to create individual intentions. These intentions only then lead to the intended behavior if there is actual control over the behavior. This theory also makes note of a significant number of background factors that contribute to attitudes, norms, and perceived control and exert influence on intentions.[9] As Mencarini and colleagues (2015) note this is a multi-factor paradigm where "fertility outcomes...are seen as depending directly on fertility intentions, which in turn depend directly on attitudes (related to the perceived benefits and/or costs of reproduction), subjective norms (related to the social approval of behavior from relevant others), and perceived behavioral control.[9] Possible constraints can further intervene from the time the fertility intention was formed and the subsequent behavior (such as a disruption of the couple's relationship or changes in individuals' health conditions or job status).[9]

Attitudes

Attitudes about having a child are based on behavior beliefs, or the subjective probability that a behavior will produce a particular outcome,[8] about the outcome of having a child. In fertility intentions research, this includes questions about the perceived benefits and detriments for having a child. As Azjen and Klobas (2013) note, these can include items like measuring agreement with statements such as "I believe having a child is a necessary part of being an adult" or "I believe a child would restrict my freedom to do the things I enjoy".[8] As noted in discussion of the current state of research on fertility intentions, there is relatively less focus on attitudinal items as compared to behaviors.

Subjective Norms

Norms concerning fertility intentions, according to Ajzen and Klobas (2013) pertain to injunctive norms and descriptive norms. Injunctive norms come from being told or inferring what others (such as partners, parents, or friends) want us to do.[8] Descriptive norms are more easily measured and these include items like the number of siblings in the respondent's family. These norms can be subtly different from beliefs; Ajzen and Klobas give the example that the behavioral belief that "my partner would be pleased if I had a child" is different from the normative belief that "my partner wants me to have a child".[8] In the latter, pressure is exerted from outside the individual and may influence his/her intention around having children. There is a fair amount of research on fertility intentions that has addressed the effects of norms and ideals on intentions.[10] Researchers acknowledge that fertility intentions may be highly

influenced by fertility ideals, which reflect the normative context around which fertility decisions are made[10] and that these social norms produce a strong push/pull on individuals as they make these choices.[10,11]

Perceived Control

Perceived control in terms of fertility intentions focuses on the "resources and obstacles that can facilitate or interfere with having a child".[8] In fertility intentions research, the focus is on factors that contribute to the decision to have a child, such as the availability of childcare and housing, which are items found in the Generations and Gender Survey across Europe. These factors are also explored in qualitative work on childbearing such as work by Edin and Kefalas (2005) and Hewlett (2003).[12,13]

Fertility Intentions and Links to Behavior

In addition to using the Theory of Planned Behavior to understand how intentions relate to behaviors, researchers have empirically examined the connection thanks to longitudinal studies of individuals throughout their reproductive years. Westoff and Ryder (1977) examined what they call the 'predictive validity of reproductive intentions'. Using data on more than 2,300 white, married women in the U.S. from the National Fertility Study conducted in 1970 and 1975, they found that reproductive intentions tend to overestimate the number of future births (40.5 percent had intended more in 1970 and by 1975 only 34.0 percent had an additional birth).[14] They also found that intentions were more likely revised downward than revised upward, a finding later confirmed by Morgan in 1982.[15] An important note here is that Westoff and Ryder view intentions as a tool useful for population projections, not necessarily as an interesting phenomenon themselves.[14] They conclude that "reproductive intentions are tailored to conditions at time of interview and, thus, share the same possibilities of misinterpretation as other period indices. In brief, we are skeptical of the usefulness of reproductive intentions, at least for short-range population projection purposes."[14]

Following Westoff and Ryder's work, Rindfuss and colleagues (1988) examined ways in which fertility intentions are related to behavior.[6] In this work they looked at the stability of childless intentions and unanticipated delay in having children. Using data from the National Longitudinal Study of the High School Class of 1972, the authors were able to follow respondents from 1973 to 1979 to examine the stability of childless intentions and found that they were very unstable at the individual level. They postulate that this is partly because the question about ever having a

child is not time bound, but forces young adults to think decades into the future and they are unlikely to be able to say with any real certainty. Using the same data, they also examined the consistency between intentions and behavior, particularly focusing on unanticipated delay, or the group of respondents who intended to have a child in 1976 but did not yet have one by 1979. They found that this delay was related to lower parental SES (females) and lower employment levels (males) but no real pattern emerged. They propose that the delay is not consequential for a group this young (age 22-25 at the time of the last round of data) as it is still socially acceptable to delay parenthood.[6]

Schoen and colleagues (1999) used data from the National Survey of Families and Households to examine the relationship between fertility intentions and behavior, using a sample of over 2,800 non-Hispanic whites interviewed in 1987-1988 and again from 1992 to 1994. This sample included non-sterilized adults ages 16-39. The authors found that individual intentions regarding future fertility and their certainty are an important predictor of future fertility behavior.[16] They examined the relationship between intentions, behavior, and time and found that the effect of intentions on behavior is 'remarkably persistent' though the effect is less consistent over time.[16] Schoen and colleagues compare their findings to Rindfuss and colleagues noting that they found that *certainty* of intentions was more important than *timing* expectations. Schoen and colleagues found that expectations about the timing of fertility were significantly associated with behavior only in the short term. Among other variables and their relationship to fertility behavior, marital status was the most important. Importantly, the authors also discuss where fertility intentions operate in relation to other variables, noting that intentions "do not mediate the effects of other variables" but that they are important in their own right. The authors conclude that "fertility is a purposive behavior that is based on intentions, integrated into the life course, and modified when unexpected developments occur".[16]

Others have found that fertility intentions such as intended family size are a proximate determinant of actual fertility behavior[10] but that behavior is influenced by a number of other factors. Using data from the 1979 National Longitudinal Survey of Youth, Morgan and Rackin (2010) examined the correspondence between intended family size as reported in earlier surveys and observed fertility among men and women in the 1957-1964 birth cohort.[11] The authors found that discrepancies between fertility intentions and actual fertility were common. In particular, having a child before age 24 (women) and 29 (men) led to individuals overachieving

their intended parity while having children later more often led to underachieving, even when controlling for potential confounders.[11] This is an important finding in relation to trends in first birth in the U.S. If women delay their first births they may underachieve their desired parity due to 'aging out' of their reproductive years.[17,18]

Monnier, using data from the National Institute for Demographic Studies (France) examined intentions and behavior for 2,000 women over the period 1974-1979 (1974, 1976, 1979).[17] He found that consistency between intention (as measured in 1974) and behavior (as measured in 1979) was about 80% for women with one child who intended to have a second and 76% for women who had two or more children and did not want to have an additional child. He also found that for women with one child who reported that they did not want to have a second, consistency was lower (62%) and notes that perhaps women felt pressured to keep with social norms of having a two-child family. Another finding from this work is that the consistency between intention and behavior was much stronger for women whose intentions remained the same in 1974 and 1976, suggesting that the strength and/or certainty of an intention plays a role (similar to the findings of Schoen et al.[16]), and the longer an intention has been held the more "robust". Related to increasing age and intentions, Monnier notes:

> "...it should be noted that time has opposite effects on intentions and behaviour of women who wished to have a child. With the passing of the years, their intentions tend to change, but, at the same time, the degree of consistency between intention and behaviour becomes stronger. This contradiction is a reflection of the underlying selection procedure: women who, in 1976 or 1979, had still not produced the child they desired in 1974 undoubtedly experienced greater difficulty in conceiving or, more generally, were subject to conditions which were less favourable to a birth. Revising their original intentions down-wards can, therefore, be interpreted as an acknowledgement of their difficulty or even inability to conceive.[17]

Monnier's mention of intentions being revised downward with age is confirmed by findings from Morgan[15] which will be discussed in the Literature Review of Fertility Intentions and Age section.

Fertility Intentions, Age, and Health

In Ajzen and Klobas' model,[8] they note two important components in thinking about fertility intentions as they relate to advanced maternal age and the use of assisted reproductive technologies: perceived control over having a child and beliefs about enabling or interfering factors. The increase in the availability and sophistication of fertility treatments coupled with shifting norms in parts of U.S. society about parental age and delaying first birth have led to an

interesting moment to re-examine fertility intentions and what these intentions mean for the health of a population. Fertility intentions and their relation to age have important implications for public health. The mean age at first birth among women has steadily risen in the U.S., from 21.4 years in 1970 to 25 years in 2006 and in some states the mean age is now above 27.[19] This trend is important since older women attempting to conceive may have difficulty due to advanced age (defined as >34 years). Although the use of fertility treatments such as in-vitro fertilization (IVF) and intra-cytoplasmic sperm injection (ICSI) have increased[20] by more than 60,000 cycles from 2003 to 2013, corresponding research on the long-term health effects of such technologies has not kept pace. The use of fertility treatments and assisted reproductive technologies to conceive may influence the health of the mother and/or child in ways that are not yet fully understood.[21]

Infertility is estimated to affect 7.4% of married women 15-44 in the U.S.[22] or, according to the American Society for Reproductive Medicine, about 10% of women of reproductive age overall.[23] Women having difficulty conceiving may turn to infertility treatments in order to have a child. Infertility treatments include three levels:

Level I: ovarian stimulation including the use of medications such as clomiphene;

Level II: use of gonadotrophins to stimulate the ovaries; may include intrauterine insemination (IUI);

Level III: assisted reproductive technologies, including in-vitro fertilization (IVF).

Women starting infertility treatments may progress through the levels before reaching pregnancy, which can take 2-3 years.[24] If women under 35 wait to begin treatment until one year of having unprotected sex without conceiving, as recommended by the National Institutes of Health[25] or women older than 35 wait six months before seeking treatment, then women will be progressing through their less fecund years[b] while moving through the fertility levels. This likely makes conceiving more challenging due to age-related decline in fecundity. Leridon, using historical data from France to simulate natural fertility, estimates that if a woman postpones birth from age 30 to 35, she reduces her chance of conceiving by 9% and the use of assisted reproductive technologies (ART) can compensate for 4% of that lost fertility. For a woman who postpones from 35 to 40, she reduces her chance of conceiving from by 25% and ART

[b] Beginning around 32 and increasing rapidly around 37, as per the American College of Obstetricians and Gynecologists, 2008

compensates for only 7%.[18] In other words, the use of ART can compensate for some of the fertility lost to delaying age at first birth, but some women will still not be able to achieve a conception.[18] Women over 30 are the majority users of ART in the US, accounting for almost 89% of all assisted reproductive technology procedures performed in the US in 2002.[26]

In addition to age-related decline in fecundity, research has found that advanced maternal age (defined as >35 years of age) is associated with increased risk of stillbirth,[27] increases in NICU admission,[28] low birth weight,[29–31] Autism,[32] and Down Syndrome,[33] compared to women of younger ages (typically compared to 25-29 year olds in research studies). Researchers have also found risks for those above 30: birth weight increases with maternal age until age 30, when it begins to decline,[30] and the effect of age >30 on low birth weight is strongest for African American women;[29] stillbirth rates are approximately 25% higher in nulliparous 30-34 year olds compared to those 25-29;[34,35] and women over 30 are significantly more likely to have negative obstetric outcomes such as preeclampsia and postpartum hemorrhage compared to those 25-29 years of age.[36]

Fertility Knowledge and Age

Despite the increased age at first birth and growing use of fertility treatments, there is limited research on what women know about fertility and age-related fertility decline. One study, examining knowledge of fertility decline among women in Canada who had already had a live birth found that women had knowledge of the conception difficulties associated with advanced maternal age but had limited knowledge of the health risks associated with childbearing at later stages.[37] A study of university students in Sweden found that both men and women had 'overly optimistic' perceptions of a woman's ability to become pregnant at later ages, with almost half of women in the sample intending to have children after 35 without an understanding of the decline in fertility that begins in the mid-30s.[38] This may be due, in part, to the high age at first birth in Sweden (29.1 years)[39] and social norms around mothering which may contribute to misconceptions about fertility and age. Another study examining fertility knowledge among childless women age 20-50 years across Canada found that despite women having high knowledge of fertility decline and factors that affect fertility, more than 70% believed that for women over 30 overall health and fitness level was more important than age in its effect on fertility.[40] Another study in the UK confirmed the finding that women erroneously believe that healthy habits are very important in achieving pregnancy.[41] There appears to be very limited recent (post 1970) research examining fertility knowledge among women in the U.S. generally.

A 2009 nationally representative study of 1800 young adults 18-29 focused on fertility knowledge as it relates to unplanned pregnancy. Specific fertility questions focused on contraceptive use and failure rates. One noteworthy finding from this study was that 19% of females and 14% of males responded that it was "quite likely" or "extremely likely" that they are infertile, which is statistically unlikely.[22,23] Follow-up questions to discern why female respondents believed they are infertile included whether a doctor had told them (25% yes), a relative is/was infertile (24% yes), or they have unprotected sex and have not gotten pregnant (35%) yes.[42] Other studies examining fertility knowledge in the U.S. appear to be narrowly focused on a specific demographic, such as cancer patients.[43,44] If we assume that knowledge in the U.S. is similar or less than that of respondents from the UK and Canada, then this lack of knowledge is startling especially given the large shifts in age at birth in the U.S. with births to women above 30 growing steadily (Figure 4)[45] and shifts among some subgroups, such as among Asian and Pacific Islanders where the age at first birth is now well over 28.[19]

Literature Review of Fertility Intentions and Age

There is limited research to-date on the influence of age on fertility intentions. Previous research has examined how fertility intentions differ by age, gender, and parity in the UK. This study, using data from the British Household Survey (a panel study), found that women tended to reduce their intended family size as they aged.[46] This study also found that childless women grew more uncertain about their intentions with age. An important finding was that among the oldest group of women (35-39 years of age), 44 percent did not have the child they originally intended. Berrington notes that "for many of these women the increase in sub- and in-fecundity with age means that time will be running out".[46] In a sub-sample of childless women, Berrington found that age is strongly related to the probability of intention to start a family, as is education level, but partner status is not significantly associated with intention. Berrington suggests that women who postpone childbearing into their 30s but intend to have children have high levels of education and high earnings. Further sub-sample analyses, specifying three different models, were carried out with older childless women (in 1992) who went on to have a child in the following six years. The first model included demographic and socioeconomic characteristics; the second model included those characteristics included in model one and added women's intention (Yes, no, don't know); and the third model included those characteristics in model one and added joint fertility intentions to test the effect of a partner with similarly positive intentions. In all three models age was a key factor in predicting that the woman would have a birth. In

model 1 a one year increase in age was associated with 0.73 lower odds of having a child in the next six years ($p<.01$). In model 2, fertility intentions had a strong, positive, independent effect on actual fertility (odds ratio = 7.22). In model 3, women with a partner who also intended to have a child were 36% more likely to achieve a birth.[46] Berrington notes in her conclusion that further research is needed to examine the "perpetual postponers" (those who postponed childbearing into their 30s but intend to start a family) and whether those who do not achieve a birth are restricted by biological, social and/or financial constraints.[46]

In the US, Morgan[47] examined fertility intentions in relation to the "later stage of childbearing" but defined that late stage not by age, but by whether woman intended to have fewer than two additional children (i.e., they were nearing the end of their desired parity). The focus of this research was not on how age relates to intentions per se, but on the uncertainty surrounding intentions and it made the case for treating intentions as more refined than a yes/no dichotomous variable. However, this study did show that certainty around intentions does vary by age and parity and this certainty decreases as women get older.[47] Morgan posits that uncertainty is a transitional stage between childbearing and post-childbearing stages and that once women reach 'minimal acceptable' family size, the interval between children grows too large, or they develop non-familial interests that "compete with the desire for more children" they revise their intentions downward.[47] This study is one example of where either qualitative research or additional survey questions that probed on some of these issues could shed some light and provide a more nuanced understanding of the factors that affect fertility intentions.

Although it focused on pregnancy intentions and age, not fertility intentions, a study by Keeton and Hayward[48] used data from the Pregnancy Risk Assessment Monitoring System (PRAMS) to look at the relationship between poor birth outcomes (including low birth weight and NICU admissions) and pregnancy intention. The authors measured age categorically and devised age categories a priori (they were 12-15; 16-19; 20-24; 25-29; 30-34; 35-44). The authors' initial hypothesis was that intention would be associated with positive outcomes. To their surprise, they found that intention was associated with greater risk of low birth weight or NICU admission for white adolescents and blacks of all ages. They suggest that this finding could be the result of retrospective intentions being revised once an infant is born, or social desirability bias of reporting a child in the NICU as unintended.[48]

The Generations & Gender Programme (GGP) Survey conducted in countries across Europe (wave 1 in 2004; at least 19 countries have conducted wave 1 and many have completed two waves) is an example of a large scale (multi)national survey that also collects additional, more detailed information about fertility decisions.[49] The GGP is a longitudinal survey of adults 18-79 living across Europe that aims "improve our understanding of the various factors - including public policy and programme interventions - which affect the relationships between parents and children (generations) and between partners (gender)".[49] The GGP includes quantitative survey questions on what components influence the decision to have a(nother) child including whether and to what magnitude the decision depends on other factors.[49,c] These factors include: financial situation; work; housing conditions; health; having a suitable partner; partner's/spouse's work; partner's/spouse's health; availability of childcare; opportunity for parental/care leave.[40] This type of data is often absent from large cross-sectional surveys, but found in qualitative research such as in-depth interviews, where the opportunity to probe responses may lead to information on *how* a respondent arrives as a decision to have a child, for example, not just the outcome of that decision. The Social Position and Family Formation (SPAFF) data set[1,50,51] is an example of the kind of rich qualitative data that can be developed to aid in understanding the nuance in fertility intentions, including how young adults make decisions about when to have children and what factors contribute to the timing of these decisions. The SPAFF dataset also provides much needed diversity in this information, since the quantitative literature focuses predominantly on white (often married) women (such as the samples used in Morgan 1982, Morgan 1981, Rindfuss et al 1988, and Schoen et al 1999).[6,15,16,47]

Quantitative Data for Examining Fertility Intentions

Fertility intentions are often examined at the population level using data from cross-sectional surveys including the Demographic and Health Surveys (developing countries) and National Survey of Family Growth (NSFG) (US). These surveys yield responses to questions such as how many children an individual intends to have and whether an individual wants to have a(nother) child (Table 1).

[c] There have been numerous research publications from these data and a complete listing may be found here: http://www.ggp-i.org/bibliography.html)]

The literature on fertility intentions includes much research on the desire to have a child and intended number of children among women in the U.S. using data from the NSFG. Articles that examine fertility intentions in the U.S. tend to fall into a few specific categories: measurement and theory, trends in intentions over time or across subpopulations, and in-depth examination of factors thought to be related to these decisions, such as religiosity and education.

Regarding measurement and theory, in addition to those items addressed in the previous sections on the link between fertility intention and behavior, S. Philip Morgan has written extensively on fertility intentions among women in the U.S. Starting in the early 1980s, he examined intentions in the later stages of childbearing using data from the National Fertility Survey in 1965 and 1970[d], finding that the uncertainty of intentions is related to both parity and age and that women with more children are more likely to consider revising intentions downward once they have reached the 'minimally acceptable' family size.[47] Later Morgan examined ideal family size and its relation to age, suggesting that delayed fertility that is due to period-specific factors and influences may lead to fertility foregone and that uncertainty about fertility intentions is often a transitional stage between delaying pregnancy and fertility foregone.[15] He also found that intentions are subject to revision and that intentions may be revised downward once the two-child ideal has been reached. In this paper, he also made the claim for including infertile/infecund women in analyses of fertility intentions.[15]

Fertility intentions are often studied in relation to trends. Chen and Morgan (1991) examined trends in the timing of first births and the relationship with intentions among women in the U.S. over the period 1970-1987 using vital registration data. They found that there was a clear shift towards parenting at older ages, including a substantial increase in first births to older women.[52] They also found childlessness was, for the majority of women, not the result of a conscious decision, but the result of postponement of childbearing, which eventually became fertility foregone.[52] It is important to note that this study was conducted at a time when ART was relatively new and the availability treatments for infertility were limited. It wasn't until 1992 that

[d] The National Fertility Survey was fielded in 1965, 1970 and 1975. The surveys were quite different: The NFS 1965 included currently married women born after 1910 and living with their husbands; the NFS 1970 included ever-married women born after 1925; the NFS 1975 reinterviewed women interviewed in the NFS 1970 who were 1) white, 2) continuously married in first marriage, 3) married less than 25 yrs, 4) married before age 25, and 5) husband married only once. The NFS 1975 also included a sample of new interviewees who were married after 1970. (Office of Population Research, Princeton: http://opr.princeton.edu/archive/nfs/)

the Centers for Disease Control and Prevention (CDC) began surveilling clinics providing these technologies so the data on actual usage in the late 1980s is not available.[53]

One study examining fertility intentions and religiosity and is methodologically of particular interest for my research due to its use of the NSFG and intention to have a child as the outcome of interest. This article used data from the 2002 NSFG and examined intention to have a child as the dependent variable; the predictor variable was religiosity. A main finding is that women who report that religion is 'very important' have higher intended and realized fertility than those who report that religion is 'somewhat important' or 'not important'.[54] Other research has examined the effect of education, social policies, and economic opportunities on fertility intentions. Heiland and colleagues, using data from West Germany (1998, 1994/5) and the EU 15 countries (2001) found that increases in education were associated with wanting three or more children.[55] Liefbroer and Corjin (1999) to the contrary found that among Flemish and Dutch young adults born between 1961 and 1965, educational attainment had a strong negative effect on women's entry into parenthood but not on men's.[56] Neyer and colleagues (2011) found that cultural norms surrounding fertility had a greater effect on fertility intentions compared to regional economic circumstances.[57] This study used the Generations and Gender Survey, a longitudinal Survey of 18-79 year olds in 19 countries across Europe[49] to explore how the economic, social and cultural environment influences fertility intentions.[57]

In the quantitative literature examining fertility intentions there is a noticeable lack of diversity among respondents.[58] Although some studies have look at differences between Whites and Blacks,[11] and between Whites and Hispanics,[58] including men is less common (Hartnett[58], Hagewan & Morgan,[10] and Morgan and Rackin[11] are notable exceptions). This may be due in part to the structure and composition of the NSFG (which began interviewing males in 2002) and the analytical techniques used to analyze the data. In focusing on women, it may be that since data from the NSFG and DHS are available in separate files by sex and although many variables exist in both data sets, not all do, some researchers focus on women only. In terms of focusing on whites, researchers often cite a lack of sample size. For example, Schoen and colleagues note that their sample included only non-Hispanic whites because there were too few blacks, Hispanics, and members of other groups to analyze separately.[16] Hartnett, since her study focused on the comparison of fertility intentions and outcomes between whites and Hispanics, excluded blacks, non-Hispanic blacks, and those of 'other' ethnicity in order to

"simplify the analysis".[58] A study by East (1998) is an example of a study of research in this area that focuses on inclusion of more groups in the analysis. In this study, using a racially and ethnically diverse sample of 574 young adolescent females (mean age 12.9) in the U.S., East found that birth expectations varied among subgroups.[59] Hispanics were more likely to desire having children younger and Southeast Asians were more likely to desire having children later. She also found that for all groups optimistic school and job aspirations were tied to later desired age at first birth.[59]

Qualitative Data for Examining Fertility Intentions

Although data from nationally representative surveys are extremely useful for making inferences about a population, the nature of surveys masks some nuance, which may be very important in truly understanding how, when, and why these decisions are made. As Edin and Kefalas note (2005) "social science currently tells us much more about what doesn't explain the trend than what does".[12] They note that social science depends too heavily on survey methodology which tells us very little about perspective and life experiences of the populations in question.[12] Qualitative methods may be extremely helpful for both getting at this nuance and also for allowing researchers to better understand how individual-level decisions are made. In public health, this nuance is very important in designing programs and policies that are aimed at changing individual-level behavior such as programs that may aim to educate individuals about fertility and age and encourage a shift away from delayed childbearing, such as programs found in some Nordic countries.[60] For example, as mentioned in the intentions and NICU admissions study by Keeton and Hayward (2007), the authors reported a surprising finding that intention was associated with poor outcomes at younger ages among white adolescents and blacks of all ages.[48] This is a good example of where qualitative data could be used to further explore and explain a phenomenon.

Studies looking at individual fertility intentions alone are rarely found in the qualitative literature, but more commonly included in studies examining how fertility intentions are influenced by other factors such as HIV status[61,62] or focusing on the qualitative aspects of pregnancy intentions.[63] Sassler and colleagues (2009) conducted a qualitative study of fertility intentions of cohabiting couples to better understand how decisions around fertility are made.[64] Questions focused on how a (hypothetical) pregnancy at that moment might be resolved and examined perceptions of the couple's future and how their contraceptive use related to those plans.[64] Augustine, Nelson and Edin (2009), in one of the few fertility intentions studies focusing on men, examined

intentions among low-income, noncustodial fathers in and around Philadelphia.[65] This research examined retrospective intentions around the birth of their child(ren). They found that a continuum of intentionality is more reflective of the experience of this group rather than a dichotomous view of intentionality.[65] One study examining women's experiences with waning fertility as they approached menopause used a phenomenological approach, with the aim of understanding the subjective experience of waning fertility. In this study, the authors found that when individuals were asked to look back on their fertility, some who were childless reported that they had never intended to have children and others reported that they had just never had the 'right' circumstances.[64] In addition to retrospective views of their fertility, the authors asked about their prospective views: women reported uncertainty about their intention to have a(nother) child, including uncertainty in general and a re-examination of previous decisions to not have a(nother) child as the door to have children began to close.[66] As one woman (age 42) noted, the decision to have a child was competing with the decision to go to school: "within the last 4.5 years, I've really wanted to have a kid, but working it around school and new interests...and so the tentative plan is to interview for school this January or February. If I don't get in- get pregnant. If I do get in- get pregnant the second year".[66] An interesting finding from this study is how the delay in first birth affects how women think about getting older and the experience of waning fertility. The authors found that women who had children in their late 30s and early 40s "were not able to conceptualize a time when their life would be their own again" compared to women who had children earlier. The women who had children earlier viewed "the emancipation of their children" as a marker for midlife and the freedom that would come with it.[66] For my research, which aims to examine the increasing age at first birth and a change in social norms around older mothers at first birth, it may become more common for women approaching menopause to still have young children living at home.

Other important qualitative literature on family formation and fertility intentions have focused on women and the decision to have children, but from the vantage point of already having children or already expecting. Edin and Kefalas (2005) developed their project partly in response to the popular culture's focus on how highly educated, wealthy women thought about the timing of pregnancies after the book *Creating a Life: Professional Women and the Quest for Children* was published in 2002.[12] That book, which was part interviews and part self-help, focused on women "taking back their lives" and achieving their goals of motherhood while still maintaining high level and high paying professional lives.[13] *Creating a Life* also focused on telling the "real

stats behind IVF" so that women could make informed decisions. The qualitative data presented in this book, which were the focus of intense critique following publication,[67] focused on nine "high-achieving women from the breakthrough generation".[13] Shortly after the media storm calling for attention to how wealthy professional women think about and seek motherhood, Edin and Kefalas began a multi-year anthropology-inspired study of over 160 low-income women living in areas of Philadelphia and Camden. In this work, the authors explore common misperceptions about low-income women and motherhood, such as the claim that low-income mothers get pregnant based on lapses in judgment or that childbearing out of wedlock is the sign of poor planning on the part of these women. Of importance to my topics, they note that many of these women do not understand how women could delay childbirth until their 30s by choice expressing a preference for, or ideal of, childbearing at younger ages. In terms of fertility intentions, many of these women do not report explicitly trying to become pregnant, but are not attempting to prevent pregnancy either. This research found that having a child when you are young and unmarried can be advantageous for a relationship (for example, making it more serious and demonstrating commitment) and strategic for a woman's career since she can "'get it over with" before turning her attention to school and a professional life. In these communities, having a child marks adulthood and comes with a level of responsibility and respect that may not come from being in school and working.[12] The work of Arline Geronimus focuses on low income African American adolescents (1996) and explores what motivates young women to become mothers and whether and how these motivations differ for low income African American teens as compared to whites. She notes that this qualitative work interviewing young mothers or mothers-to-be was inspired by exploring the quantitative data on fertility patterns for low income African American women and wanting to better understand women's motivations for having children.[68] Among the most interesting findings are that postponing childbearing to later ages means missing in-house support both from family members in raising that child and from that child when he/she is older and able to help care for his/her mother when she needs it, which some suggested was as early as the mid-30s.[68] As she notes being "future oriented" about having children may be a luxury for women who are not from persistently impoverished populations where living a long life is not a given.[68]

In previous research undertaken as a doctoral student, I, along with Diana Romero, used data from the SPAFF study to examine ideal age at first birth and how individuals conceptualize the factors that contribute to a particular age being ideal. Using data from 200 in-depth interviews

with males and females of diverse socioeconomic and ethnic background aged 18-34 in New York City and Northern New Jersey, we found that early 30s were most often cited as ideal (32% of the sample). Among those who gave a particular ideal in response to the questions "what is the ideal age to have a child" the mean was 29.3 years and the median was 30.[1] We found that factors associated with ideal age fell into four categories: structural/social position related, interpersonal, age pressure, and aspirational.

Analyzing Data on Fertility Intentions

Quantitative Methods

Approach

Quantitative data on fertility intentions often focuses on responses to two questions that address 1) wanting a child; and 2) desired number of children. These data tend to come from cross-sectional surveys. Analyses of these data typically use multivariate regression in order to control for a number of factors that are theoretically believed to be related to fertility intentions such as race/ethnicity, education, income, poverty level, employment situation, place of residence, and religiosity. Independent variables are often included in these regression models based on their influence in the model during univariate analyses.[69,70] However, Wu's important paper on using generalized linear models in family studies (2005) makes a compelling argument for only including independent variables based on theory.[71] In his example we should begin adding variables to a model if their inclusion is supported by prior research. Variables should not automatically be removed from the model if they are insignificant based on bivariate analyses, but the theory and reasoning behind their inclusion should be considered. As an example, he notes that in research aimed at testing the idea that the effects of living alone change with marital status, he notes that an interaction term of marital status and living alone should remain in the model even if it does not improve model fit since this interaction is a key component of the research aim.[71] Berry & Feldman (1985) make a similar argument in their discussion of specification error, asserting that "the best to whether a variable is irrelevant is theory".[72]

Multivariate Regression (Linear)

Multivariate regression is a method for explaining a dependent variable (y) as a function of a continuous or categorical independent variable (x), controlling for factors that may

simultaneously affect the dependent variable. Multivariate regression allows for the inclusion of other (measurable) variables of interest to be included in the regression model, whereas in simple regression, or regression with a single explanatory variable, they would have been part of the error term. Multivariate regression does not limit the number of independent variables that the researcher hypothesizes are associated with the dependent variable. Essentially, it allows researchers who work with non-experimental data to control for other variables that may confound the exposure and disease relationship by holding these factors constant.[73] The multivariate regression model (for a population) is as follows:

a. $$y= \beta0+ \beta1x1+\beta2x2+ \beta3x3...+\beta kxk+ \mu$$

Where β0 is the intercept, β1 is the parameter estimate associated with *x*1 and *μ* is the error term.

A multivariate linear regression model for fertility intentions (if measured as a continuous indicator) may look like this:

b. $$\text{Intend}=\beta0+ \beta1\text{age}+ \beta2\ \text{parity}+\mu$$

Where intentions are a function of age and parity, plus an error term. In this model, intend is a continuous variable such as intended parity (as in Hartnett[58]), $\beta0$ is the intercept, β1 estimates the effect of age on intention to have a child, holding parity constant and β2 estimates the effect of parity on intentions, holding age constant. In social science research ordinary least squares (OLS) regression is frequently used for its focus on reducing the sum of squares of the residuals. OLS provides the estimate that provides the smallest sum of squares of the residuals. This means that it chooses the estimate that is the "best fit" for the model by selecting the one where the residuals (difference between observed and predicted values) are the smallest.[73]

It is important to be selective in determining which independent variables to include in the analysis so as to specify the most parsimonious model possible. Although it is tempting to consider myriad factors related to the research question and, thus, add many variables to a model, inclusion of irrelevant variables can bias the *variances* of the OLS estimates (though not

the OLS estimates themselves).[73] However, inclusion of a collider variable, or a variable that (is caused by both the exposure and outcome) will bias the estimate.[74][e] An equally important issue is neglecting to include a relevant variable (or a variable related to the outcome and exposure of interest) in the model, which can bias estimated regression coefficient in either direction.[73] Both of these situations refer to model specification error.[72,f] Moreover, thoughtful a priori consideration of independent variables is important when specifying the analytic model given that the output from analyses of different models cannot identify when a relevant variable is missing. It is somewhat easier to statistically identify when an unrelated variable was erroneously included by examining the R^2 (i.e., estimate of overall model-fit) and by running the model again without that variable. But as Wu (2005) and Berry & Feldman (1985) stress, variables with theoretical significance should be retained even if their inclusion reduces model fit.[71,72] Box 1 includes four criteria used to guide decisions around whether to drop a variable from a model. These include whether the variable's inclusion is based on theory, whether the overall model is more robust when this variable is included, and how this variable's inclusion affects other variables. These are meant to be useful rules of thumb for including a variable, not hard and fast rules per se. [75]

In multivariate regression of data from cross-sectional surveys (with random sampling) there are a number of assumptions that must be considered, which are known as the Gauss-Markov assumptions as shown in Box 2.[73] These assumptions include that sampling was random, there is no collinearity between variables, and that there is no heteroscedasticity, or uneven variance in the errors terms. These are useful to consider in the development of model building and are essential for testing the validity of a model at the analysis stage. If any of these assumptions are not met, one may have increased risk for Type I (rejecting a null hypothesis when the null is true) and Type II (failure to reject a null hypothesis) errors.[73]

Logistic Regression

Thus far I have been discussing regression models for continuous data which are often analyzed using models such as that shown in equation a. Linear models are based on assumptions that may not be relevant for fertility intentions data, including that the dependent

[e] Distinguishing between a collider and a confounder is done by examining theory and directed acyclic graphs (Elwert & Winship, 2014)

[f] A third component of specification error (measurement errors in variables) will not be discussed here.

variable is continuous and normally distributed and the relationship between the dependent and independent variables is linear.[71] The assumptions are not met in examining fertility intentions (as in equation b above) where intentions are a dichotomous categorical variable, measured frequently as Yes/No. The nature of the responses to this question and the types of questions in Table 1 lend themselves to different regression methods that, although they conceptually share many qualities with linear models, allow for these types of dependent variables. These include logistic regression (for categories such as yes/no responses) and Poisson and negative binomial regression (for count data). Here I will focus on logistic regression with a dichotomous variable since it was more commonly found in the literature review of fertility intentions methods.[64,69,70]

Logistic regression is used to relate a predictor (x) to a binary outcome (y) using log linear model. Predictors can be continuous, binary, or categorical.[76] The logit function is used to link the linear equation to the ln(odds) of y to x.[76] The logistic regression model equation is as follows:

c. $$\text{logit}(y) = \beta 0 + \beta 1 x1 + \ldots \beta k x k$$

Taking the natural log of the odds of a variable y [ln(odds)=ln(p/1-p)] gives us a more interpretable odds ratio (OR) to work with. Slopes calculated from logistic regression can be exponentiated to produce odds ratios.[76] In fertility intentions, a simple logistic regression model might look like this:

d. $$\text{Intend} = \beta 0 + \beta 1 \text{age}$$

or

e. $$\text{ln(odds of intending a child)} = \beta 0 + \beta 1 \text{age}$$

Where *intend* (ln(p/1-p)) is the probability of intending a child for a given age.

Since the Gauss-Markov assumptions shown in Box 2 are violated in dichotomous logistic regression (for example, linearity), there are other statistics that can be used for evaluating the fit of the model including the model Chi-Sq, the pseudo-R^2 and global and focused fit indices[77] to see if the overall specified model is a 'good fit' for the data.

The interpretation of the exponentiated form of the log-odds coefficient from binary logistic regression[76] is as follows (assuming the variable is coded 1=Yes, 0= No or absence of outcome):

$$\text{OR} = \frac{\text{odds (success) or Yes}}{\text{odds (1-success) or No}}$$

For example (using the model shown in d above), if β1is -0.69 this can be interpreted as for each additional unit increase in age, the expected change in the log odds is -0.69. If we exponentiate the log odds so that we can interpret the results on the multiplicative, rather than loglinear scale, we can interpret the results as women have half the odds of intending to have a child with each one year increase in age (or women are half as likely to want kids with every one year increase in age) ($e^{\beta 1} = e^{-0.69} = 0.50$). [77,78]

Multivariate Regression of Fertility Intentions Data in Practice

Although statistically it may be most appropriate to use logistic regression or other regression models in fertility intentions research with dichotomous outcomes, in the literature some researchers also use OLS and provide methodological explanations for this choice. For example, in Bitler and Schmidt (2011),[26] for a study of the effects of insurance mandates on the use of infertility treatments using pooled data from the NSFG, the authors used OLS (linear probability models) for ease of interpretation despite having a binary dependent variable. They also include results from logistic regression (including marginal effects) of the same model, demonstrating that the results from OLS are robust.[26] Similarly, Hayford and Morgan (2008) in their study of the influence of religiosity on fertility intentions, use OLS and note that "Poisson or negative binomial models might technically be more appropriate for this analysis….(however) our results were robust to the specification of the model, and chose to use linear regression for the convenience of the interpretation of the coefficients".[54] As compared to logistic regression, results from OLS may be more easily interpreted. Logistic regression transforms the y variable in to a log odds, so interpreting results from logistic regression requires an understanding of odds and what makes odds different from probability. For example, in Bitler and Schmidt's paper they analyze data using both OLS and logistic regression but focused on the OLS results in the results section. In noting a coefficient of 0.041 from OLS examining the insurance mandate, age at least 30, and at least some college, they write "This suggests that for highly educated older women, living in a mandate state is associated with a 4.1 percentage point increase in the probability of ever having had sought medical help to get pregnant".[26] Results

from the same model using logistic regression (presented in table format in the paper) would be interpreted as "for highly educated older women, living in a mandate state is associated with a 1.948 higher likelihood (nearly a 2-fold increase) of having had sought medical help to get pregnant" which may be less easily understood, especially if the results are at aimed at non-researchers such as policy makers and the media. OLS (linear probability models) and logistic regression may produce very similar results when applied to the same data set (with dependent variable coded 0, 1) as Pohlman and Leitner (2003) note.[79] However, they suggest that if testing relationships is the goal, either OLS or logistic regression can be used, but if estimating probabilities is desired, logistic regression should be used. [79] Logistic regression also makes it more difficult to detect potential errors that may make the model a less good fit, such as heteroscedasticity.[73]

In the fertility literature, there are options regarding how to treat intentions when they are the dependent variable, which has an impact on the type of logistic regression that is best suited for the analysis. In Morgan's work from the early 1980s, he makes the case for treating 'don't know' and other uncertain responses as uniquely different from missing data, as valid and meaningful responses about an individual's fertility intentions.[15] In his earlier work[47] he found that capturing this uncertainty was especially important for women nearing the end of their childbearing (in terms of parity). For example, using data from the NSFG in 1976, he found that for women with two children, there were an equal number of women who "don't know" their intentions for another child as compared to those who said yes, they intended to have a(nother) child.[47] In including uncertainty as a crucial part of the intentions variable, the methods must be adjusted accordingly. For example, in his paper on intention and uncertainty at later stages of childbearing[47] and parity-specific fertility intentions,[15] the variable 'do you and your husband intend to have a(nother) child?' is treated not as a binary variable, but one with multiple categories requiring the use of multinomial logistic regression in the case when they are not ranked, for example, when Morgan[47] created three categories: Yes; No; Don't know. In the later paper[15], he further refined this to a 'ranked' or ordered categorical structure including four categories for the dependent variable: Yes, 2+ more; Yes, 1 more; Don't Know. In both of these treatments of the response to the question of intending a(nother) child, the responses are treated at a greater level of specificity than yes/no. This is supported by qualitative data, such as that from Augustine et al,[65] which found that among low-income, noncustodial fathers,

reflections of intention to have a child operated on more of a continuum of wanting versus not wanting, rather than a dichotomous view of intentionality.

Another methodological challenge in measuring fertility intentions, which applies to both quantitative measurements such as survey data and qualitative measurement such as through in-depth interviews is the "mere-measurement effect" which refers to the fact that when intentions are measured they can be influenced, or that when you ask an individual about his or her intentions just asking about the intentions makes acting upon those intentions more likely. Thaler and Sunstein (2008) call this a 'nudge' and note that social scientists have found this to be true in many contexts.[80]

Qualitative Methods

Approach

As discussed, there are limited qualitative data examining fertility intentions but the data that do exist focus on a deeper understanding of the context in which decisions are made. These type of data often come from in-depth interviews, where a researcher has a one-on-one interview with a participant that explores a limited number of topics and often includes "probing" or "drilling down" on topics of particular relevance to the research question.[81] This type of data collection allows for the researchers to explore a topic in-depth and to allow the participant to fully respond to questions beyond predetermined answer categories such as in a survey. One advantage to using qualitative methods such as in-depth interviews as compared to surveys is that in addition to acquiring answers to questions the researchers identified in advance, the data may also provide insight and answers to questions the researcher did not think to ask.[82] This type of data collection is often used in pilot or formative research to identify potential questions and topics for quantitative data collection at a later date, but is also used to collect the type of data such as collected in SPAFF that is not easily captured in surveys because it is either too complex or too delicate.[83]

Despite the advantages to using qualitative methods such as in-depth interviews, there are some drawbacks that limit their use. Compared to cross-sectional surveys, in-depth interviews include far fewer individuals, which reduces the generalizability of the findings to larger populations, which is useful for understanding population-level intentions for purposes such as

population projections. This is a common critique of qualitative data collection among researchers evaluating it through a quantitative lens. In looking at fertility intentions research, an area dominated by demographers and sociologists, quantitative methods are seen as superior to qualitative methods since the goal is often generalizing to large populations.[84] However, this is not the goal of qualitative researchers who, instead of seeing individual cases as representative of a larger group (as individuals in a cross sectional survey would be representative of some larger group based on sampling weight), we view cases as a single case.[84] In qualitative work we are not seeking representativeness or a sample large enough so that potential biases can be 'controlled away' as Small puts it.[84] Instead we are intentionally seeking not a 'sample' in the traditional (quantitative) sense, but a selection of individuals from which we can learn about a specific research question or phenomenon.[84] As Auerbach and Silverstein put it "your research concern is to learn about their lived experience"[85] not about testing hypotheses. They note that in quantitative research "human phenomena are studied scientifically by converting them into numerically measurable independent and dependent variables" but for qualitative researchers, restricting data into known variables is too limiting.[85] In order to find a sample that gives the researcher the best opportunity to understand an issue or phenomenon, Auerbach and Silverstein advocate for theoretical sampling, which is the "process of choosing a sample in order to extend and refine a theory". The total number of cases is known only when the researcher has reached theoretical saturation.[85]

This re-orientation away from the quantitative/statistical lens requires some adjustment on the part of the researcher. The methods utilize to collect and analyze the data are also quite different. In-depth interviews, as compared to cross-sectional surveys, may be more time and labor intensive and produce a large amount of text that must then be analyzed using methods that require a different approach to the data than quantitative methods.[85] In depth-interviews are not simply survey questions read aloud to a participant, but requires a breadth and depth of questions to both explore a topic broadly and to dig in to certain aspects of a topic. The latter requires a range of potential probing questions and that the interviewer have significant interpersonal skills including excellent listening skills, the ability to read a situation, and empathy.[83] In fertility intentions research the type of dichotomous questions typically asked about wanting a child would be replaced by more open-ended questions about attitudes and desires around childbearing, and probing questions to address the factors that contribute to these individual attitudes and desires.

Qualitative methods also require researchers to be reflexive, or able to examine oneself and one's relationship to the data, in a way that is different from conducting quantitative research. Researchers using qualitative methods benefit from a deep and personal connection with the data. Analyzing qualitative data requires that researchers take stock of their own biases, feelings, and thoughts that may be influencing how they are seeing the data.[86] As Breuer and colleagues (2002) note, the sciences 'try to create the impression that the results of their research have objective character…(and) are—or at least should be – independent from the person who produced the knowledge, e.g., from the single researcher.'[86] Qualitative research, according to the authors, "makes the impact of the researcher far more obvious than in its quantitative counterpart" and qualitative researchers cope with this by engaging with the nature of their interaction with the data and being reflexive.[86] This is an orientation that can require some adjustment for those steeped in a quantitative approach, and is a skill that can be refined and improved as noted by Watt.[87]

Qualitative Analysis

As opposed to quantitative data analysis, which is deductive and focused on testing a researcher's theory of a phenomenon, the analytic approach with qualitative data is inductive, i.e., without a priori hypotheses, thus, allowing for themes and topics to emerge from the data. This draws heavily on grounded theory methodology, an approach developed by Glaser and Strauss (1967) and refined by Strauss and Corbin (1994).[88,89] Grounded theory methodology is an analytic approach to qualitative data that identifies important themes/concepts related to the phenomenon under study that are grounded in open-ended and contextualized data from respondents.[89] This is accomplished by applying codes to the data, grouping these codes into categories/themes and then refining these categories into concepts/constructs using a repeating/iterative process. This involves open coding where the data are "broken open" as LaRossa describes, and transcripts are closely examined and questions are developed about the phenomenon in question. The next step is axial coding, where a researcher digs deeper into one topic or code and looks for how to relate categories to subcategories.[89] The third coding step is selective coding, or as LaRossa puts it "the main story underlying analysis".[90] This step is more focused and refined, with a clear view toward the question you are trying to answer. Together these concepts may lead to a theory about the phenomenon or research question.[89] In previous qualitative research, my approach to the analysis of in-depth interviews has also been

influenced by the subsequent (and arguably more "step-wise/pragmatic" application of the Grounded Theory method) work of Auerbach and Silverstein, who advocate for using a coding procedure that involves a series of steps, grouping repeating ideas/themes and eliminating less common ones, and progressing to higher levels of abstraction that may approach theoretical propositions.[85] These levels include: first, identifying text-based primary categories and subcategories ("relevant text"); second, grouping of the text-based categories into larger themes ("repeating ideas"); and third, organizing themes into more abstract theoretical constructs. During the initial approach to the data, the researcher is also developing analytic logs ("memos") to map shifts in thinking about the focus of the analysis as well as to guide the development of schematics and tables that may become useful in developing theory. The initial coding approach is what Ritchie and Lewis (2003) refer to as a 'code and retrieve' method whereby categories are developed and codes are applied across all data.[83] However, this is an iterative process and although some codes and categories may seem appropriate after reading 20 transcripts, by transcript 100 they may have changed substantially. One advantage to the 'code and retrieve' method is that it applies a somewhat systematic review to take stock of the data.[83]

An additional tool that aids in thinking systematically about the data is the creation of visual tools such as matrices, which encourage making comparisons, seeing patterns, and identifying differences in the data that may lead you to see you data differently.[91] As Miles and colleagues note, the "matrix is a tabular format that collects and arranges data for easy viewing in one place, permits detailed analysis, and sets the stage for later cross-case analysis with other comparable cases or sites".[91] This type of visual allows the researcher to see how the data are shaping up and identify areas for comparison. It also aids in theory-building, since often many factors that may together be part of a conceptual framework may appear in your matrix and it may become apparent how they intersect and interact to influence the phenomenon at the center of your inquiry.[91]

Qualitative Methods and Fertility Intentions Data in Practice

In research on fertility intentions qualitative data may be very helpful for understanding factors related to the desire and timing of children that are not captured by cross-sectional surveys. For example, cross-sectional surveys capture data on a number of variables that may be considered independent variables in a regression model including education level, marital status, parity, and

income level. However, information about desires around the timing of a child and how an individual's thinking about having a child is influenced by those factors are not easily captured in survey form. In the SPAFF data set, we see the value of these types of data in interviews where respondents are asked about their ideal age to have a child and then probed for what factors make for an "age ideal." Beyond answering the interviewer's question, respondents went further and talked about things such as the order of events or their aspirations for their personal life before having a baby. One important thing that emerged from these data that was not directly asked was some individual's ideal timing and how that contrasts with biological realities. For example, Keisha is a single, 32-year old. If her timing works out she will be 35 or 36 at the earliest when she tries to start a family:

> *Of course, marriage first, then once we figure if I'm married, let's just say between two and three years, because I want to get to at least enjoy it with no kids. After that, go to school and from there get a degree and then kids come along. Even while I'm in school, I wouldn't mind being pregnant then. I would definitely want to at least be married first. From then on, of course the house. First and foremost I think I would want to be married first. (Keisha, single, age 32)*

In the analysis of these data, we looked at themes including structural/position related factors associated with the ideal age to have a child ("school", "degree"), interpersonal factors ("married"), aspirational ("I want to get to at least enjoy it with no kids"), and financial ("housing"). We also looked at how old Keisha was at the time of the interview, her situation at the time in terms of partnership status and educational level, and her timeline to examine the cognitive dissonance between what she is saying about her desire to have a child and her reality in terms of timing and her own fertility if she waits for all of these factors to fall into place before attempting to conceive. This is what is sometimes referred to as a quasi-variable approach, in which some variables such as demographic variables like age, race/ethnicity and income level are examined in cooperation with conceptual categories coded within the data; for example, a researcher may stratify codes by age and examine the qualitative results separately for those >35 as compared to those <35.[83]

In practice, it is more difficult to find specific details on the analyses used in many qualitative research studies. Often articles will tell you about the approach to the data and level of coding, but not to the extent that you could recreate the research step by step, the way you might be able to recreate research explained in quantitative studies. For example, in a study of self-induction for abortion, the authors describe their research methods as "We aimed to identify

recurring patterns and outliers of the varying situations in which women attempted self-induction".[92] Augustine and colleagues' study of low-income non-custodial fathers describes the analyses quite simply noting that "we coded these transcripts using standard qualitative methods…we then retrieved coded material for more refined qualitative coding and analysis".[65] This is partly due to the difference in approach in that qualitative research relies on the active participation/reflexivity of the researcher in a way that is foreign to quantitative research. However, there are some studies that have provided insight into how the data were analyzed. Edin and Kefalas, although they focus on pregnancy intentions in their discussion of the coding and analysis approach, describe coding each transcript it its entirety and coding relevant text into predetermined or emergent topics. They then describe a final product that was organized "like a quantitative dataset, in a case-by-variable" format.[12]

Gaps in the Literature and Future Research

There is a notable lack of research in the U.S. on fertility knowledge, particularly how it relates to age. This is a remarkable absence in the face of the considerable research and attention (i.e., publicity, funding) given to sexuality education and in particular abstinence education for young adults. Young adults often have required sex education that focuses on preventing pregnancy, sexually transmitted infections and HIV, but may graduate from that education without any understanding of their own fertility, and in particular how fertility declines with age. This lack of knowledge combined with upward trends in the age at first birth may mean that many young adults have unrealistic expectations about their own fertility. When they do attempt to conceive and essentially 'flip the switch' from preventing pregnancy to encouraging it, they may need to turn to ART to aid in achieving a live birth. ART has grown more sophisticated and more common, with more than 60,000 cycles from 2003 to 2013[53] but research on the effects of ART, and in particular on the long-term effects of these technologies on both women receiving the treatments and other actors such as egg donors, has not kept pace. We have very limited information on the long terms effects and safety of these procedures; yet, their growth continues.

Given the interesting shifts in age at first birth coupled with the increasing availability of ART, one could postulate that the social norms surrounding both age at first birth and the use of ART

are changing too, which may result in interesting cohort trends over time. For example, do women who were in the mid-30s in the 1970s differ significantly from women in their mid-30s today in their intentions and expectations around childbearing? We might expect to see that with the change in social norms comes a change in fertility intentions, with more women being confident about their ability to postpone childbearing until an 'ideal' time without having to self-limit the number of children they desire. Data from the NSFG would allow for this kind of comparison, using pooled data sets from when the survey began in the 1970s through to the last iteration in 2011-2013.

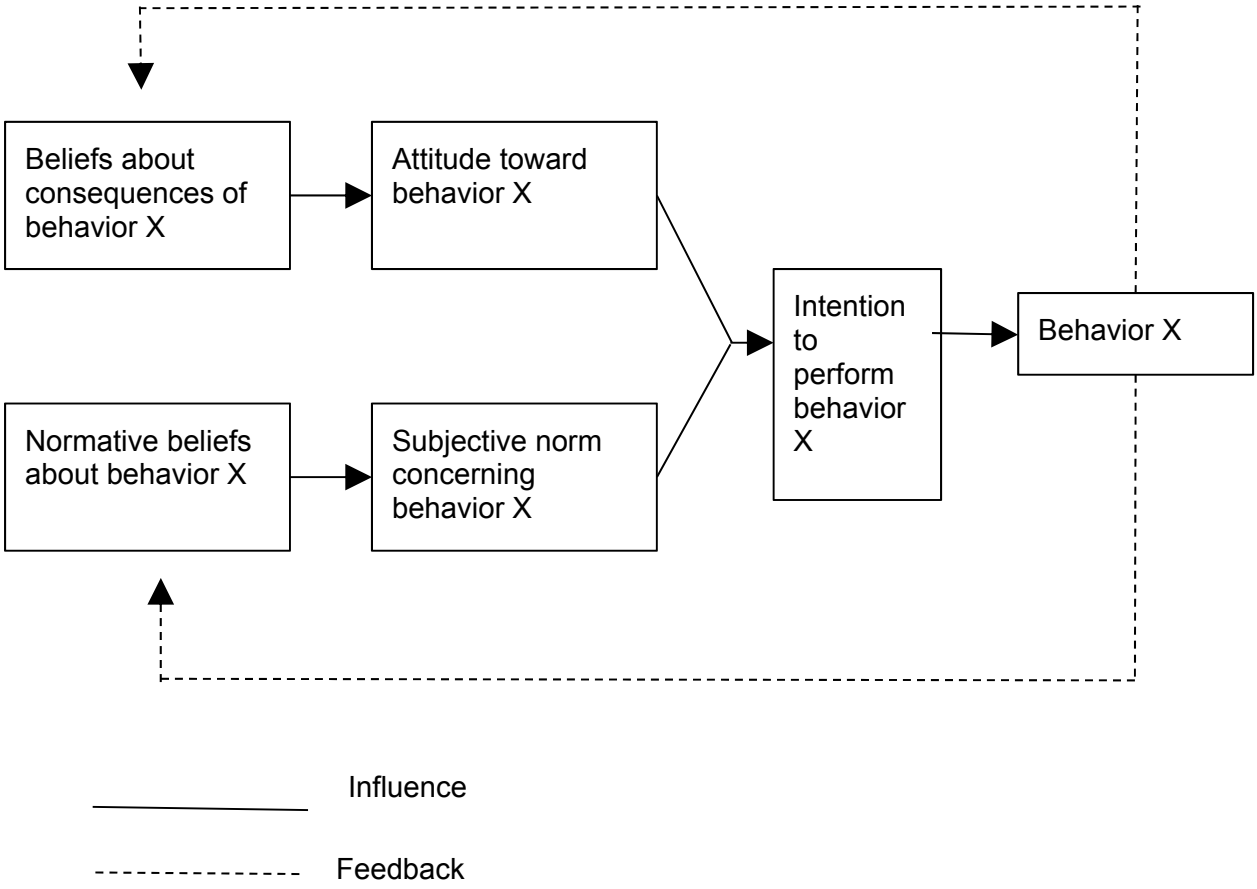
A notable deficiency in fertility intentions research to-date is the lack of attention paid to male intentions around fertility and to intentions of minority populations, i.e., those who are *not* female, partnered, white, (and often, middle class) at the time of the survey. Qualitative methods have taken on these groups that have been seemingly neglected by cross-sectional surveys, and have provided an interesting counterexample to the narrative put forth by demographers when it comes to discussions of fertility intentions in the U.S. However, there is still much more work to do. Currently, we see representation of these groups typically in small, focused studies, such as the work of Edin and Kefalas looking at how low-income women, often non-white, in inner city Philadelphia make decisions about childbearing. While these studies are very important for providing the viewpoint of these often neglected groups, we need additional research in order to shed a light on how other groups make decisions around whether, when and how to have children. We should push for more inclusive studies in two ways: 1) cross-sectional and longitudinal surveys that are nationally representative, but perhaps with oversampling of some groups traditionally under-represented in this type of research, in order to have enough statistical power to make comparisons across groups (Note: although the NSFG does oversample non-whites, after stratifying by certain variables of interest (e.g., parity, relationship status) sample sizes often get too small to work with reliably); and 2) qualitative studies that include participants from diverse backgrounds and from different races/ethnicities rather than splitting these groups into separate 'niche' studies.

In closing, fertility intentions have persisted as a topic of interest to researchers from diverse disciplines for at least the past four decades for good reason: they are universal (when asked we all have some intentions about whether or not to have children); they may be useful for predicting larger social trends (labor force participation; population growth); and they are

methodologically and theoretically challenging in their complexity. This paper has provided me an opportunity to think critically about fertility intentions and how they relate to age and changes in social trends in age at first birth, take stock of and critically appraise the research that has been done to-date, and consider where my future research fits in this body of work.

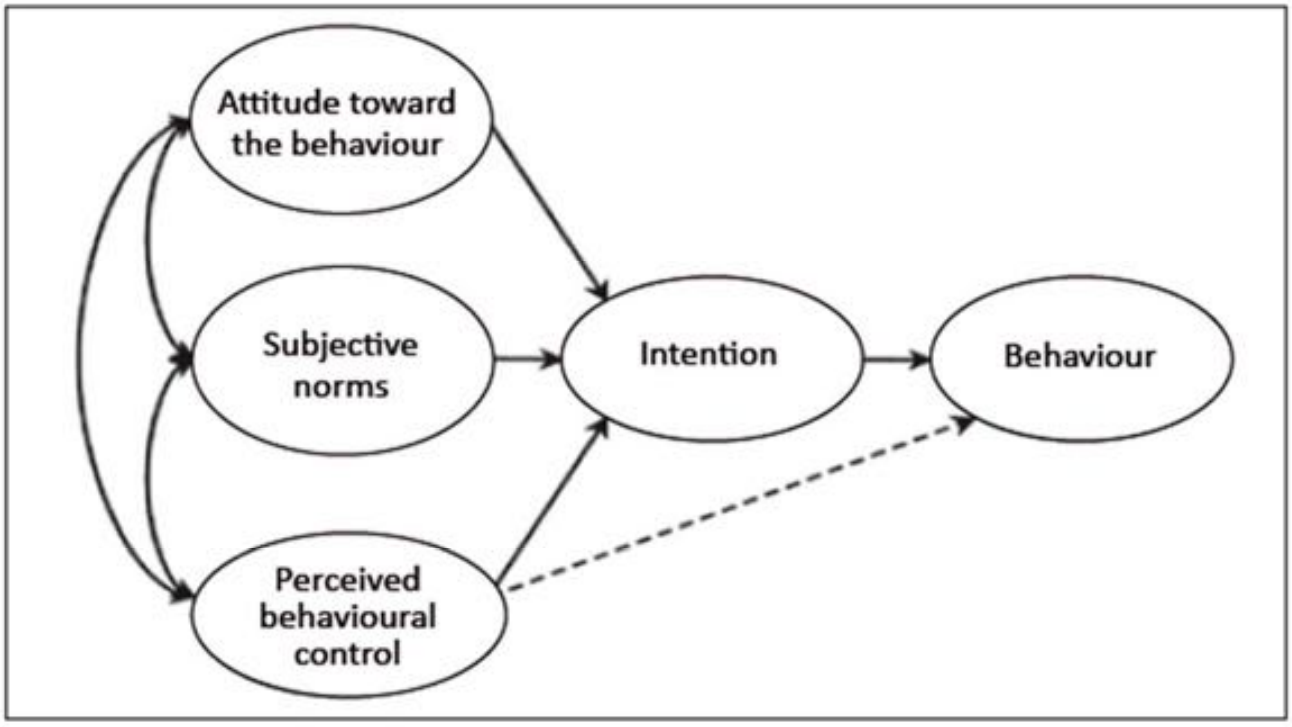
Tables and Figures

Figure 1. Theory of Reasoned Action



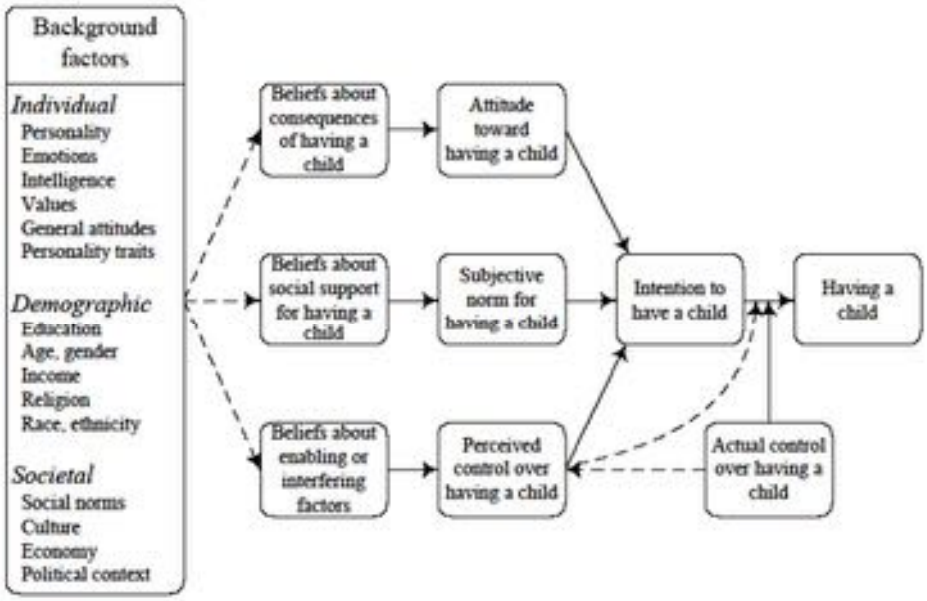
Source: Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall.

Figure 2. Theory of Planned Behavior



Source: Ajzen, I. (1991). Theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50*, 182. http://dx.doi.org/10.1016/0749-5978(91)90020-T

Figure 3. The Theory of Planned Behavior Applied to Fertility Decisions



Source: Ajzen I, Klobas J. Fertility Intentions: An approach based on the theory of planned behavior. Demographic Research, 2013;29(8):203-232.

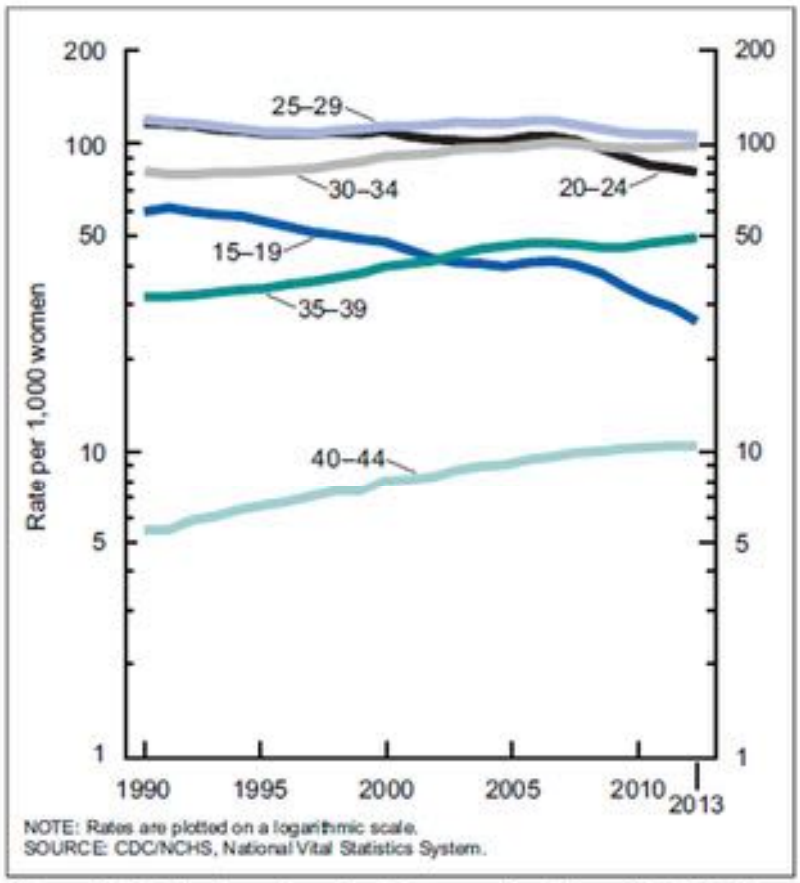


Figure 4. Birth rates, by selected age of mother: United States, 1990–2013

Source: Martin et al. Births: Final Data from 2013. National Statistics Vital Reports. 2015;64(1).

Box 1: Four Important Criteria for Specification

Theory: Is the variable's inclusion in the model theoretically sound?

t-test: Is the variable's estimated coefficient significant in the expected direction?

R^2: Does the model fit improve when the variable is included?

Bias: Do other variables' coefficient change significantly when the variable is included?

Source: Studenmund AH. Using Econometrics: A Practical Guide. 2000. New York: Pearson.

Box 2. Gauss-Markov Assumptions (for cross sectional survey data)

MLR1: *Linear in parameters*
The model can be written as in equation *a* above

MLR2: *Random sampling*
We have a random sample of n observations that we can use to estimate the model

MLR3: *No perfect collinearity*
No variables in the sample are constant and there is no exact linear relationship between independent variables

MLR4: *Zero conditional mean*
The error term has an expected value of zero, given any values of y

MLR5: *Homoscedasticity*
The variance of the error term does not vary given any value of x

Source: Adapted from Wooldridge, 2006

Table 1. Fertility Intentions as Measured in Cross- Sectional[g] National Surveys

Data Source	Question	Answer Categories
National Survey of Family Growth (1973; 1976; 1982; 1988; 1995; 2002; 2006-2010; 2011-2013)	Looking to the future, do you intend to have (a/nother) baby at some time (after this pregnancy is over)?	Numeric (Yes; No; NR/DK)
	(Not counting your current pregnancy,) how many (more) babies do you intend to have?	Continuous/Scale Response
Demographic and Health Surveys (years vary by country)	Now I have some questions about the future. Would you like to have (a/another) child, or would you prefer not to have any (more) children?	Numeric (Have another child; No More; NR/DK)
	If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be? (women with living children)	Continuous/Scale Response
	If you could choose exactly the number of children to have in your whole life, how many would that be? (women with no living children)	Continuous/Scale Response
Eurobarometer (special edition on Childbearing Preferences and Family Issues in Europe) (2006)	And for you personally, what would be the ideal number of children you would like to have or would have liked to have had?	Continuous/Scale Response
	How many children do you (still) intend to have?	Continuous/Scale Response
	In your opinion, what is the ideal age for a woman to have her first child?	Continuous/Scale Response

[g] Fertility intentions are also measured in some panel studies such as the British Household Panel Survey (UK), the Generations & Gender Programme Survey (Europe) and the National Longitudinal Study of Youth (US) but these are outside the scope of this exam.

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I. MATERNAL HEALTH OUTCOMES IN IMMIGRANT WOMEN

i. Literature review

a. *Introduction*

Over the past four decades, patterns of immigration have changed rapidly, with the most dramatic changes observed in female immigration. In 2006, 12.5% of the United States (US) population was foreign-born (1), but foreign-born individuals accounted for over a third of the growth in the US population in the last 30 years (2). The proportion of immigrants that are female is also increasing: in 2000, females accounted for 55% of all immigrants, a much higher proportion than in previous immigration waves. Immigrant women are also more diverse in type and region of origin than in the past. Female immigrants now include family-sponsored migrants, independent labor migrants, refugees and asylees, and undocumented migrants. Since the 1980s, immigration from Latin America and Asia has accounted for 85% of total female immigration (2). Related to that trend, the proportion of births to foreign-born women has grown steadily, from 15% in 1990 to 24% in 2004, a 60% change (3).

While the "immigrant paradox", a term that refers to favorable birth/infant outcomes among immigrant women despite high levels of socio-economic disadvantage, has been well studied, less is known about whether this pattern holds for maternal health (4). This literature review focuses on maternal morbidities and mortality among immigrant women and differential outcomes between immigrant women and native-born women. The review concentrates on outcomes in immigrant women emigrating from less developed countries to more developed countries in the Western hemisphere (predominantly in North America). To provide a comprehensive epidemiological profile of immigrant women, the outcomes span three periods across the periconceptional continuum: the antepartum period, the peripartum period, and the postpartum period. The antepartum period covers the period from conception to birth. Adverse conditions and outcomes that arise in this period are closely linked to preconception health. The peripartum period covers a briefer period from immediately before labor until immediately after delivery. The postpartum period typically covers the period from delivery to 1-2 years after delivery. This review concentrates on four adverse outcomes that are relatively prevalent and/or severely compromise the health

of mothers in the US: gestational diabetes mellitus (antepartum), maternal morbidity (peripartum), postpartum depression (postpartum), and maternal mortality (antepartum, peripartum and postpartum).

In addition to describing and evaluating the occurrence of these key outcomes among immigrant women and the risks associated with nativity status, this review highlights several common methodological challenges, including conceptualization of causal pathways, appropriate comparison groups, lack of necessary adjustment for confounding, and non-representative samples. Studies differ in their conceptualization of covariates and potential causal pathways. Some authors envision key factors, such as socio-economic status, as confounders of the relationship between nativity and maternal health. Yet others characterize these same covariates (e.g. SES, social support) as intermediaries in the pathway from nativity to maternal health outcomes. While most studies treat obstetric-related risk factors (e.g. maternal age, parity, receipt of prenatal care) as confounders, there is less uniformity regarding social determinant risk factors. Comparison groups are particularly important when examining differences between immigrant and native-born women. The literature is mainly divided between studies using all native-born women as the reference group to all foreign-born women and studies employing within stratum comparisons (e.g. comparing US-born Hispanic women to foreign-born Hispanic women, or more specifically, Mexican-born women to US-born women of Mexican descent). While the choice of comparison group depends partly on the research question, finer categorizations of immigrant women and within stratum comparisons might be most appropriate, especially when interested in the effects of the post-migration environment, such as the effects of acculturation (e.g. time since migration, language proficiency) and social support. Confounding, in general, is a particular concern in studies of the effects of nativity due to the social, economic, and obstetric differences between native-born and foreign-born women and their potentially strong effects on the outcomes reviewed here. Lastly, non-representative samples are subject to selection biases and may not be representative of either foreign-born or native-born populations.

b. *Gestational diabetes mellitus*

Gestational diabetes mellitus (GDM), defined as carbohydrate intolerance with onset or first diagnosis in pregnancy, is a growing concern in the US. The most recent national estimate of GDM is 3.7% (as of 2001 from the National Hospital Discharge Survey) and has increased across all racial and ethnic groups in the US in the past decade (1,5). Gestational diabetes is linked to a 10-50% higher risk of maternal type-2 diabetes in the 5 years after birth and several poor birth outcomes, including macrosomnia and preterm birth. Risk of GDM is highest among older women (35 years and more), women with a low socio-economic status, Native-American women and women from Asia and the Middle East (5).

Several studies have examined the prevalence of GDM among foreign-born women in the United States. There has been one nationally representative study, 4 regionally representative studies, and a handful of smaller, non-representative ones. Studies have reported a range of estimates for overall prevalence among foreign-born women: from 3.0% to 8.5% (1, 6, 7). All studies have, however, identified variation in GDM prevalence between foreign-born subgroups, and for the most part these country-specific estimates have been similar across studies. For example, in a large, population-based study of US births, the prevalence of GDM was highest in Asian Indian women (6.5%) and lowest in Japanese women (1.9%) [6]. Two other regional studies in the US found a similar pattern of highest prevalence among Asian Indian women and lowest prevalence among Japanese women (1, 8). A NYC population-based study was able to look at finer categorizations of country of birth for regions outside of Asia. The authors found the highest GDM prevalence among Indian women, who had a prevalence of 11.9%, and the lowest prevalence amongst Ecuadorean and Panamanian women (each 4.4%) [7].

Due to the considerable variation in GDM prevalence by region of origin, most US studies have compared subgroups of foreign-born women to their US-born counterparts and thus report odds ratios for the nativity-GDM relationship stratified by ethnicity or region of origin (1, 6-9). These studies have found general consistency: within strata of ethnicity, foreign-born women have higher risk of GDM than their

US-born counterparts; and there is variation in the nativity-GDM relationship by ethnicity/region of origin.

Although Hispanic foreign-born women tend to have elevated risk of GDM compared to their US-born counterparts, the relationship between GDM and nativity varies by country of origin. Ramadhani and colleagues reported an odds ratio of 2.2 in foreign-born Hispanic women versus US-born Hispanic women adjusted for age, smoking and drinking status (9). Amongst Mexican women, the relationship between nativity and GDM has not been consistent across studies. Adjusting for age, Braun and colleagues reported a 13% greater odds of GDM among Mexican-born women compared to US-born, Hispanic women in Colorado (it was unclear whether the women who identified as US-born Hispanics were of predominantly Mexican origin) [4]. Two regionally representative studies found a 25% and 50% greater odds of GDM among foreign-born Mexican women compared to their US-born counterparts adjusting for multiple demographic and obstetric factors (e.g. pregnancy weight gain, prenatal care) [1, 7]. However, a nationally representative study reported a decreased odds among Mexican foreign-born women compared to their US-born counterparts, adjusted for age, prenatal care, education, marital status and parity (aOR=0.91, 95% CI 0.90-0.92) [6]. For other Hispanic nationalities (e.g. Puerto-Rican, Dominican, Central and South American), studies report significantly higher prevalence among foreign-born women compared to their US-born counterparts, although there is variation in magnitude between studies (i.e. aOR/aRR ranges from 1.07-1.20 for Caribbean Hispanic and 1.07-1.70 for Central/South Americans) [6, 7].

Studies comparing foreign-born and US-born women of African descent are less consistent. Studies that have adjusted for various demographic and obstetric factors, have reported 14% (aOR=1.1, 95% CI 1.1-1.2) and 80% (aOR=1.8, 95% CI 1.5-2.2) higher odds of GDM among foreign-born Black women compared to US-born counterparts (1, 6). However, a national study comparing foreign-born Black women to their US-born counterparts reported a decreased though non-significant odds of GDM adjusting for age and smoking/drinking status (aOR=0.8, 95% CI 0.2-1.8) [9]. One regionally representative study with within region of origin comparisons found that foreign-born non-Hispanic

Caribbean women had a 40% higher adjusted risk of GDM than their US-born counterparts, while sub-Saharan African women had a non-significant 60% higher adjusted risk of GDM compared to their US-born counterparts. Further disaggregation of the Caribbean group by national origin showed that foreign-born Haitian women had a 50% greater adjusted risk of GDM, while foreign-born Jamaican women had a non-significant 10% greater adjusted odds of GDM (7).

Studies have also found considerable variation by country of origin amongst Asian and Pacific Islanders. Several studies have reported higher adjusted odds of GDM among foreign-born than US-born women in the following country of origin groups: Filipina (aOR=1.1, 1.8, 1.9), Indian (aOR=1.3, 1.7, 1.8), Chinese (aOR=1.3, 1.5) and Pacific Islanders (aOR=1.5) [1, 6-8]. In contrast, studies have reported lower adjusted odds of GDM among foreign-born Japanese and Korean women compared to their US-born counterparts (1, 8).

Few studies have examined variability in known risk factors among immigrant and native-born women in the US or abroad. The few that have examined these associations have found that immigrant women have lower prevalence of traditional obstetric risk factors such as pre-pregnancy overweight/obesity and pregnancy weight gain than US-born women (1, 9). However, researchers have noted that immigrant women are more likely to be older at the time of pregnancy than their US-born counterparts; older age is a strong risk factor for GDM. Three US studies found that adjustment for maternal age attenuated, but did not remove the association between nativity and GDM for most regions/countries of origin (4, 6, 9). These findings suggest that maternal age only partially explains the difference in risk of GDM observed between many immigrant and US-born women. Two studies have shown that additional adjustment for socio-economic status, timing of prenatal care, and parity further attenuated (compared to age-adjusted model), but did *not* remove the association between nativity and GDM. However, the magnitude and significance of the associations after full adjustment differed by nationality (see Appendix) [1, 6]. In contrast, in a study of Hispanic women in Colorado, adjustment for educational differences removed the association between Mexican-born and US-born Hispanic women (4). Only one study adjusted for BMI during pregnancy; this study found that further adjustment for

anthropomorphic differences strengthened the positive associations between nativity and GDM among some ethnic groups: non-Hispanic white, Black, Chinese, Indian, Filipina, Pacific Islander, and Mexican women (1). These findings suggest that the relative contribution of demographic and obstetric differences differs by region of origin/ethnicity and underscore the importance of examining stratified associations.

Conclusions: This review of GDM studies shows considerable variability in GDM risk both across racial/ethnic groups and regions of origin. Some immigrant subpopulations (e.g. South Asians and Filipinas) show consistently higher rates of GDM compared to their US-born counterparts, while a smaller subset of other subpopulations show lower rates (e.g. Japanese and Korean). The findings for some populations are inconclusive, as the magnitude and direction of the association within these subgroups varies from study to study (e.g. women of African decent and Mexicans). Differences in the risk of GDM among subgroups might be due to differences in time since migration or to differences in the prevalence of risk factors in the country of origin (8). Other inconsistencies could arise from comparison group differences.

While more in-depth studies that examine variation in risk factors are needed, some evidence suggests that the influence of traditional GDM risk factors, such as obesity and age, might vary between foreign-born and US-born women by region of origin. Traditional anthropomorphic risk factors seem to be less significant predictors of GDM risk among certain subgroups of immigrant women, most notably in Asian and Pacific Islanders (1, 8). Socio-economic factors, on the other hand, might explain differences by nativity status among Hispanic women in particular. The extent to which innate genetic differences that affect glucose metabolism, migration-related selection factors, and post-migration acculturation-related factors affect risk of GDM in immigrant women is unknown. Furthermore, it is likely that these factors (particularly genetic and post-migration environmental factors) interact with one other. One interesting, alternative explanation of nativity-related differences in GDM risk is the early life programming hypothesis, which posits that a poor (i.e. calorie restricted) environment *in utero* and in the early postpartum period predisposes individuals to metabolic syndrome in adulthood when these individuals experience food abundant environments. Poor prenatal nutritional environment changes

postnatal metabolism and thus programs individuals to store fat, leading to a greater risk of diabetes (10, 11). More studies are needed to identify the cause(s) of variation in GDM risk observed among subgroups of immigrant women.

c. *Maternal morbidity in the peripartum period*

A broad category, peripartum maternal morbidity encompasses numerous conditions that occur immediately before or after delivery, including preeclampsia, perineal lacerations, and placental disorders. General risk factors for peripartum maternal morbidity include older maternal age (≥ 35 years), parity (e.g. higher parity for placental abruption and nulliparity for laceration), and history of the condition in a preceding pregnancy as well as pre-pregnancy conditions (e.g. hypertension, GDM). The prevalence of peripartum morbidity varies by condition: the prevalence of immediate postpartum hemmorhage was 2.1% in 2001, while hospital-based prevalence estimates of perineal laceration ranged from 2.2-19.9% in the US (5).

Only a few studies have examined maternal morbidities of the peripartum period among immigrant women and compared immigrant women to their native-born counterparts. Two studies have been conducted in the US and have reported similar results. In a retrospective cohort study of births at an inner-city hospital in Atlanta, foreign-born women had a nearly 2-fold higher risk of perineal laceration than US-born women (OR=1.7, 95% CI 1.7-1.8). When stratified by region of origin, all foreign-born subgroups had higher risks than US-born women; however, the association was strongest among foreign-born Asian and African women compared to all US-born women (RR=2.2, 95% CI 2.0-2.4 and RR=2.0, 95% CI 1.4-2.9). Only African foreign-born women had a statistically significant risk (no relative risk reported) of hemorrhage compared to US-born women, possibly due to higher prevalence of female genital cutting and its associated scarring and obstruction (12). A population-based study of births in Washington State reported an increased risk of placenta previa and febrile illness among foreign-born Southeast Asian (SEA) women compared to US-born, non-Hispanic white women. Specifically, foreign-born Cambodian and Vietnamese women had 70% (OR=1.7, 95% CI 1.2-2.4) and 100% (OR=2.0, 95% CI 1.7-2.6) greater risks of placenta previa compared to US-born white women, adjusted for gestational

age, birth weight, and method of delivery. All groups had a lower risk of preeclampsia compared to that of US-born white women. Higher risk of placenta previa in SEA women might be due to abnormal placental migration and larger placenta (known to be associated with higher parity) [13].

One Canadian, population-based retrospective cohort study examined the relationship between recent immigration and maternal placental syndrome, defined as preeclampsia/eclamspsia, placental abruption or placental infarction at the index delivery. The reference group included those residing in Ontario for more than 5 years, which included both women born in Ontario and those who immigrated more than 5 years prior to delivery. The authors found a progressively lower adjusted risk of placental syndrome associated with recent immigration in models adjusted for age, income, pre-existing hypertension, diabetes, multiple gestation, and receipt of prenatal ultrasonography at 12-24 weeks gestation. For example, those who immigrated 3 months prior to delivery had a 89% decreased adjusted risk of placental syndrome, with the risk rising in a graded manner with longer time since migration. More recent immigrants in this study also had lower rates of independent risk factors for placental syndrome, such as of obesity and hypertension, than longer residing immigrants and Canadian-born women. The graded effect of duration was also observed within strata of income, suggesting that socio-economic factors did not fully explain risk associated with duration (14).

Conclusions: Far from definitive, the limited body of US-based literature is suggestive of an increased risk of some maternal morbidities among foreign-born vs. US-born women. Risk of peripartum morbidities, such as perineal laceration, seems to be strongest among women from Africa and Asia. However, an important limitation exists within the US studies: lack of adjustment for potential confounders. At a bare minimum, these studies should adjust for differences in age and parity (two maternal characteristics associated with both peripartum morbidity and nativity). Other maternal obstetric risk factors, such as small pelvic size, genital cutting, history of prior maternal morbidities (e.g. GDM), and method of delivery, might have mediated or confounded the relationship between nativity status and peripartum morbidity. Notably, the comparison groups used in the two US studies were US-born women and US-born white women. These comparison groups might be useful in ranking the peripartum risk of

subpopulations. On the other hand, such comparisons have limited utility for addressing questions about the role of acculturation or adaptation in the post-migration environment. Acculturation-related factors, particularly language preference and proficiency, might be a fruitful avenue for future research. Communication barriers specifically in the second stage of labor might result in prolonged labor leading to greater risk of hemorrhage and laceration (12). The Canadian study suggests deteriorating health with increasing duration of residence (14); however, the study might not be generalizable to the US context, in which differences in access to prenatal care and migration-related selection might have different impact on findings.

d. *Postpartum depression*

Postpartum depression, a clinical depressive condition that can affect women up to a year after delivery, is the most common complication of childbearing (15). Mothers with a history of postpartum depression are at risk for a number of poor health and social outcomes, including, recurrent episodes of depression either related or not related to childbirth (16), family discord and loss of income (15). Ten to fifteen percent of new mothers in the US develop symptoms indicative of depression in the postpartum period (17). Prevalence estimates of depressive symptomatology among immigrant women range from 8% to 38% (18-28). Most studies in the US and other developed Western nations have found higher levels of postpartum depression among immigrant women than native-born women (18, 20-25, 27, 28). However, studies that have examined the association between nativity and postpartum depression across racial/ethnic strata have found variable results (26, 29). Comparison across studies is complicated by a number of methodological issues, some of which are similar to those identified in the earlier gestational diabetes section. Many studies do not use representative samples. Even when representative samples are employed, sparse cell bias may occur especially when immigrant and native-born women are disaggregated by race/ethnicity. Socio-economic status and the amount and quality of social support might also help explain the relationship between nativity status and postpartum depression (as intermediary variables); however, inclusion of these factors in multivariable models varies widely from study to study.

Canadian studies have consistently found higher rates of depression among immigrant women compared to those born in Canada, with particularly high rates among those from non-English speaking countries in developing regions. Two well-designed studies conducted in Canada found considerable differences between foreign- and Canadian-born women. One population-based study of postpartum depressive symptoms reported that 25% of immigrants from minority groups (i.e. born in a country outside of Europe or outside of a country with major English ancestry) vs. 11% of Canadian-born women and 8.3% of immigrant women from majority groups (i.e. born in Europe or country with major English ancestry) experienced high levels of depressive symptoms on the Center for Epidemiologic Studies Depression Scale (CES-D) (24). A similar Canadian study examined postpartum depressive symptoms using the Edinburgh Postnatal Depression Scale (EPDS) in subgroups of immigrant women by entry status and Canadian-born women. This study found elevated levels of depressive symptoms among non-refugee immigrant women (35%), asylum seekers (31%) and refugees (26%) compared to Canadian-born women (8%). After adjusting for prenatal care and visible minority status, immigrant women still had a 4-fold greater odds of having postpartum depressive symptoms compared to Canadian-born women (22).

While these studies suggest higher incidence of postpartum depression among foreign-born women compared to their native-born counterparts, few studies have examined variability in risk factors to help elucidate potential causes behind these patterns and adjust for potential confounding. Researchers have identified several factors that may predispose immigrant women to postpartum depression including established risk factors such as stressful events, low social support and marital strain as well as immigration-specific factors such as discrimination in the host country in single group studies (i.e. immigrants only) and smaller two-group studies (i.e. bivariable associations between nativity and potential risk factors) [23, 30]. Only two well-designed, Canadian studies have used multivariable analysis to examine risk factors in immigrant and non-immigrant women. One of the Canadian studies found a significant inverse association between self-rated health and postpartum depression symptoms among Canadian-born women, adjusting for income and education, but not among immigrant groups. Immigrant women from minority-status groups had a higher probability of depressive symptoms

regardless of their self-rated health. The authors concluded that Canadian-born women might be more likely to incorporate mental health into their conceptualization of general health than immigrant women (24).

A recent cross-sectional analysis of a sample of pregnant Canadian women, examining the potential mediating roles of socio-economic and social support in the relationship between length of stay and postpartum depression, found higher prevalence odds of depressive symptoms in foreign-born than Canadian-born women independent of length of stay. After adjusting for socioeconomic factors, differences in odds of depressive symptoms between foreign-born and Canadian-born women were attenuated. For example, intermediate-term immigrants (i.e. 3-8 years residing in Canada) had a 35% greater odds (aOR=1.35, 95% CI 1.03-1.77) of depressive symptoms than Canadian-born women in the model with socioeconomic factors compared to 61% greater odds (OR=1.61, 95% CI 1.28-2.03) in the unadjusted model. The association between immigration status and depressive symptoms was further attenuated after adjusting for social support [e.g. for intermediate-term immigrants: 6% greater adjusted odds (95% CI 0.79-1.22) of depressive symptoms than Canadian-born women]. Similar attenuation was found across models for recent (fewer than 2 years) and long-term (9 or more years) immigrants. However, the magnitude of the attenuation after adjusting for socio-economic status was greatest among long-term immigrants, whereas attenuation was greatest among recent immigrants after further adjusting for social support (31). These results suggest that differences in the occurrence of depressive symptoms by nativity status may be related to differences in social support and socio-economic status, but patterns are difficult to confirm due to demonstrated variability by region/ethnicity and a limited body of studies.

In contrast to the Canadian studies, most US-based studies lack either direct (18, 19, 32) or adjusted comparisons between immigrant and native-born women (26, 29). One nationally representative study in the US used a population-based sample, and found that US-born women had a slightly higher level of any depressive symptomatology than foreign-born women: 42.0% (95% CI 40.0-44.0) in US-born women vs. 36.1% (95% CI 32.7-39.5) in foreign-born women. US-born women had a significantly higher level of depressive symptomatology within Black, White, Hispanic groups but not Asian and

Pacific Islanders. For example, foreign-born Asian women had a higher level of depressive symptomatology than US-born Asian women: 41.2% (95% CI 37.5-44.9) in foreign-born vs. 32.3% (95% CI 19.5-45.1) in US-born. This study involved small sample sizes for Asian and Pacific Islanders limiting their power to detect differences in these subpopulations. In contrast, Hispanic and Black foreign-born mothers had a slightly lower prevalence of depressive symptoms than their US-counterparts despite greater rates of poverty. The authors noted that greater social support (measured as the presence of a partner at home) and lower rates of teenage birth among foreign-born, Hispanic and Black mothers might counter the harmful effects of socio-economic strain; however, they did not perform multivariable analyses to explore the relative contribution of these factors (26).

In a non-population-based US study, the authors directly compared US-born women of any race/ethnicity to three groups of foreign-born women (Vietnamese, Congolese, and Hmong) and examined the relationship between depression and infant development. All three groups share a history of social violence, colonization, and have large refugee populations in the US. Using the depression subscale of the Hopkins Symptoms Checklist-25, only Congolese women had a mean score indicative of clinical distress (2.15) [29].

A handful of studies have examined acculturation factors (e.g. language, duration of residence) and postpartum depression. In general, these studies have not found a consistent relationship between various measures of acculturation and higher levels of depression. Studies conducted in the US have focused exclusively on the Latina population. One study using a convenience sample of pregnant and postpartum Latinas from public clinics in San Antonio, Texas, found that US-nativity and English preference were associated with elevated levels of depressive symptoms using the EPDS in bivariable analysis (33). Another US study using a brief acculturation scale validated in a mixed-gendered Hispanic sample (the Short Acculturation Scale) found no significant relationship between acculturation status and postpartum depression (34). It should be noted that although acculturation is a complex, multidimensional construct, studies to date have used crude measures of acculturation (even the validated scale was based

solely on language preference). In addition, most studies examining acculturation lack adjustment for potentially confounding variables.

Conclusions: While a consistent pattern of higher risk among foreign-born women and specific subgroups of foreign-born women (e.g. from non-English speaking developing countries) emerged from a series of Canadian studies, the limited US literature is inconsistent and has several limitations. Similar comparative studies have not been conducted in the US and there is a need for studies that examine differences in well-established risk factors for postpartum depression between immigrant and US-born women. In particular, studies should examine whether or not variations in social support and SES might explain observed nativity-depression associations. In addition, acculturation-related factors are important as potential modifiers, and studies to date have been limited in their exploration of acculturation influences. Questions remain regarding the impact of different acculturation-related factors, such as age at migration, duration of residence, language preference, on depression in the postpartum period. In addition, the interplay between acculturation status and key social determinants (e.g. SES and social support) has not been studied in the US.

e. *Maternal mortality*

Maternal mortality is rare in Western, developed countries, largely reflecting a high level of general health and adequate access to medical care (5,35). Maternal deaths are sentinel events that are thought to correspond with maternal morbidity. Not only medically determined, maternal deaths are also related to larger social and economic conditions of the mother or group to which she belongs (35). Maternal deaths are classified as direct (resulting directly from the pregnancy) or indirect (resulting because pregnancy exacerbates a pre-existing condition or illness) [5]. The US has one of the highest levels of maternal mortality among developed regions; in the US, the maternal mortality ratio [defined as the number of pregnancy-related deaths in a year/number of live births in a year x 100,000 (5)] was 15.1 per 100,000 live births in 2005 (36). Only two studies, to the best of my knowledge, have examined maternal mortality in immigrant women in the US, and comprehensive US-based studies of maternal mortality and nativity are lacking. One earlier report found a significantly higher mortality ratio amongst

foreign-born Hispanic and Asian women compared to their US-born counterparts from 1991-1997. Specifically, foreign-born Hispanic women had a 50% greater pregnancy-related maternal mortality ratio than their US-born counterparts (11.8 v. 8.0 per 100,000 live births). Asian-Pacific Islanders had an 80% greater pregnancy-related maternal mortality ratio than their US-born counterparts (12.7 v 6.1 per 100,000). However, the authors noted that the US-born ratio for Asian-Pacific Islanders should be interpreted with caution due to instability of the estimate (fewer than 7 events occurred in this subgroup). Mortality ratios did not differ between foreign-born and US-born Black women (37). Another hospital-based study in Georgia found a non-significantly, elevated risk of maternal mortality among foreign-born women compared to US-born women (RR=1.2, 95% CI 0.5-2.5). The wide confidence interval was due to the small number of maternal deaths that occurred from 1991-2001 (12).

Most studies that have focused on the immigrant subpopulation have been conducted in Europe. These studies have consistently found a pattern of higher mortality among immigrant women from less developed regions than native-born women. Using data from 1970-1985 in one of the earliest studies to document higher maternal mortality in immigrant women, Ibison and colleagues reported a 2-fold increased risk of maternal death among women born in Asia, and a 5-fold increased risk among women born in Africa and the Caribbean, after adjusting for age and year of death, compared to their English-born counterparts. Foreign-born and native-born women were similar in parity and social class; these factors likely did not explain differences in mortality between the two groups (38). One recent population-based, case-control studies conducted in the Netherlands reported highly elevated odds of death among non-Western immigrants (OR=2.1, 95% CI 1.6-2.7), women from Surinam/Dutch Antilles (OR=2.7, 95% CI 1.7-4.3), and other immigrants from Africa and Asia (OR=3.3, 95% CI 2.3-4.8) compared to their Dutch-born counterparts (39); and another population-based, case control study in Spain reported a high age-adjusted odds of death among immigrant women compared to Spanish-born women (aOR=1.9, 95% CI 1.0-3.3) [40].

Researchers have suggested that substandard care is a main determinant of differential mortality in immigrant and native-born women. One follow up study examining sub-standard care in the

Netherlands was conducted on 101 direct maternal deaths. Refusing medical advice, delay in general practictioner's (GP's) recognition of symptoms, delay referral by GP, inadequate antenatal care by midwife were all more likely to occur among foreign-born than Dutch-born women (p <.05). For preeclampsia cases only, insufficient treatment of hypertension and seizures were more likely to occur in foreign-born than Dutch-born women (p=<.05 and <.01 respectively) [41].

Conclusions: These findings from Europe suggest a consistent pattern of increased risk of maternal death in immigrant women compared to their native born counterparts. These findings are consistent across region of origin, and there is some evidence from European countries that the increased risk among foreign-born women is growing (see 35). While studies in the US are quite limited and small in sample size, there is some evidence from a national sample that maternal mortality ratio may be higher in foreign-born women than US-born women in certain racial/ethnic strata (e.g. Hispanic women). Maternal mortality is a rare event in developed regions. Two factors might be contributing to differential mortality between immigrant and native-born women: poorer health status of immigrants from developed regions and poor quality of care due to cultural incompetence, interpretation issues etc. Additionally, in the US, differences in insurance status might explain higher mortality in foreign-born women. There is some evidence that suggests that poor quality of care might be driving greater risk of death in foreign-born women in the Netherlands and in other European countries (41). More studies are needed to determine which factors play a role in the potentially higher risk of maternal death among immigrant women in the US.

f. *Explanations/hypotheses of immigrant maternal health*

Researchers have offered various explanations for the observed relationships between nativity status and the maternal health outcomes explored in this review. Several overarching themes emerged in this review, which are summarized below: biological factors, health care access and quality of care, culturally determined attitudes and practices in pregnancy/postpartum, and migration-related experiences.

Biological factors: Some researchers have suggested that biological and genetic factors may account for differences in maternal health outcomes observed in immigrant and native-born women. Biological

explanations are most applicable to the peripartum morbidity and GDM literature. For example, in regards to peripartum morbidities, some have noted that larger placentas and prolonged labor due to smaller pelvis size among Asian women might contribute to the higher prevalence of certain morbidities such as perineal laceration (13). Researchers have also suggested a role for genetic factors specifically in regards to GDM (1, 4, 6, 8, 38). For example, the "thrifty gene hypothesis" posits that diabetic genotypes confer a survival advantage in times of famine by maximizing excess food energy, but increase the risk of obesity and diabetes in times of abundance (8). In addition, as mentioned in the GDM subsection, the early-life programming hypothesis asserts that malnutrition during fetal development (regardless of the specific genotype) results in impaired pancreatic *beta*-cell functioning (important for glucose metabolism) [10, 11]. Consequently, immigrant women from countries where under-nutrition is prevalent might be pre-programmed to develop GDM when exposed to food abundance and physical inactivity (1). While biological factors may play a role in increasing susceptibility to certain maternal conditions, it is important to consider the combined effects of biological factors and the environment. For example, having a certain genotype, such as the thrifty genotype, does not, in and of itself, predict or explain disease. Instead, it is the interplay between the genotype and the environment (as well as health behaviors such as dietary changes) that might lead to disease. In addition, underlying genetic/biological factors cannot explain differences in outcome by region of origin (since women with shared ancestry are presumed to share similar genetic profiles).

Health care access and quality of care: In host countries, immigrant women face numerous barriers to accessing appropriate and culturally competent health services. These barriers are related to income, legal immigration status, language and lack of interpretation services, and culture (12, 28, 35, 42). Not only do these barriers potentially prevent or delay immigrant women from obtaining health care, but they also impact the quality of care they receive when accessing services (43). Health care access and quality explanations are particularly salient to peripartum morbidity and maternal mortality. In addition, experiences with barriers to care and inadequate care might be more common for recent immigrants, those who belong to more recent immigrant waves (presumably less established subgroups), and those without

legal status to reside in the host country. Some studies in this literature review have documented cases of substandard care, particularly in obstetric care during or immediately after delivery. Interestingly, authors have asserted that language and communication difficulties, social distance and isolation could all affect the substandard care observed among immigrant women (39, 40). Communication issues as well as isolation might be potential intermediaries through which immigrant women receive sub-standard care in their host country due to undetected early symptoms or misunderstanding regarding treatment (44).

Culturally-determined attitudes and practices in pregnancy/postpartum: Cultural attitudes and practices have special importance during pregnancy and the postpartum period (30, 45, 46). Researchers have suggested that the disruption of postpartum rituals (i.e. practices and beliefs surrounding childbirth and the postpartum period) and the related disruption of relationships with key family members, who are important sources of support, guidance and knowledge in the postpartum period, might put immigrant women in a particularly vulnerable state during and after migration (45, 47). Immigrant women might also be expected to carry out traditional practices even in the absence of necessary social support from family and community members who share common beliefs and practices, which might create greater strain for new mothers (45). Furthermore, expectations around motherhood may differ between the native and host country; thus, immigrant women may experience unfamiliar and culturally incongruent standards and norms (47). Socio-cultural attitudes and practices are likely to play an important role in the development of mood disorders, possibly more so than in the other maternal outcomes discussed in this review.

Migration-related factors, including acculturative stress: Immigration and childbearing are interconnected processes. Immigrant women tend to have high rates of childbearing after immigration (48). Migration related factors include pre-migration factors, post-migration factors and the impact of economic, social, and cultural changes associated with immigration (49). Examples of pre-migration factors affecting the morbidities and mortality discussed in this review include trauma in the country of origin stemming from experiences of war and socio-political upheaval (46), female-genital cutting (12, 35), the health status of the country of origin (e.g. malnutrition, diabetes) [8], and pre- or inter-pregnancy conditions (e.g. STIs

and other infections, family planning, inadequate prenatal care in previous pregnancies). Trauma from violence and social upheaval might predispose immigrant women to mental health issues (23, 46). Female genital cutting might account for higher rates of 4th-degreee perineal laceration and postpartum hemorrhage, which might occur more frequently among women with scarring and obstruction from female genital cutting (12). Finally, endemic malnourishment or other poor nutrition patterns in sending countries might lead to higher prevalence of GDM among some immigrant groups (4, 6).

In addition, post-migration experiences often involve exposure to multiple stressors that might affect maternal health, such as language and cultural barriers, concerns over legal status, unemployment, homelessness, social isolation, lack of access to education and health care, separation from family and marital strain, and discrimination (46, 50). Some immigrant women experience overlapping life transitions migrating to a new and unfamiliar country and adjusting to life with a new infant. These dual transitions may produce high levels of stress, which is compounded when one does not speak English, has financial difficulties, faces discrimination and social isolation, or lacks familiarity with the host country's health care practices and delivery system (23, 29, 46). Moreover, migration is associated with increases in physical inactivity, psychosocial stress, and changes in diet that might put additional stress on beta cells and interact with metabolic susceptibility to diabetes (1, 6).

The "healthy immigrant effect" and "acculturation paradox" are important explanations of immigrant health (14, 43, 49, 50). The "healthy immigrant effect" refers to the generally better health status of immigrants who recently immigrate compared to US-born individuals. However, immigrants' health may deteriorate over time as immigrants adopt unhealthy behaviors and experience difficulties and barriers to health care; this deterioration in health is known as the "acculturation paradox" (49, 50). The "acculturation paradox" might account for the relationship seen between time since immigration and maternal health outcomes, as observed by Ray and colleagues in their study of placental syndrome (14). Another explanation of deteriorating health is selective return migration (i.e. healthier immigrants returning to their country of origin). Ceballos and colleagues note that relatively young, reproductive aged women have different reasons for staying in the host country or migrating home than elderly individuals

who may return to their home countries to die (51). Sicker immigrant women may remain if they perceive better quality of care for themselves and their infant in the host country (50), which might account for the relationship between duration and poorer maternal outcomes. A recent simulation study, utilizing hypothetical probabilistic models based on the assumptions of both acculturation and return migration hypotheses, found that acculturation had a greater effect on birth outcomes over longer durations, while the effect of selective return migration was greater at shorter duration (51). It is not know whether these associations hold for maternal health outcomes.

ii. Limitations

Several notable limitations exist in this literature and cut across the maternal outcomes discussed in this review. One important limitation is the availability of data. Data on region or country of birth, entry date, age at migration, duration of residence, language proficiency, and other acculturation-related factors are not routinely collected. Consequently, their relationships (individually or collectively) to maternal health have been understudied (13). Due to considerable within-group variation, treating immigrant women as a homogeneous group is not warranted and can lead to the masking of important subgroup effects. Furthermore, acculturation factors might be important potential mediators/moderators of adverse outcomes, and multidimensional measures are needed to ensure adequate construct and content validity. In addition, with one exception in the postpartum depression literature (23), there has been little examination of pre-migration factors and their impact on maternal health. Health status and social conditions during preconceptional and interconceptional periods have been recognized as having an equal role in determining maternal health outcomes, and the pre-migration period might overlap with preconception/interconception periods. An examination of pre-migration factors also allows for a broader conceptualization of health across the life course, both the accumulation of adverse exposure as well as exposure in critical periods (such as fetal development) *before* migration might impact the health of pregnant and postpartum immigrant women once in the host country.

Lastly, there are four main limitations related to study design. First, an important methodological limitation is the predominance of non-random, convenience samples. With such designs, it is difficult to

know the extent to which findings are representative for either native-born or immigrant women. Second, retrospective study designs are subject to recall bias. Recall in the postpartum period might be related to the birth experience: those with poorer birth experiences or outcomes might be more likely to report adverse exposure during pregnancy. Third, residual confounding particularly by uncontrolled obstetric factors, such as age, may bias estimates of the nativity-maternal health relationship. Fourth, bias from differential outcome ascertainment is a concern, particularly in the maternal mortality literature. For example, due to delays in the initiation of prenatal care, language barriers, and complex health systems, immigrant women's pregnancy status might not be known at the time of death. As a result, cause of death might be incorrectly classified as a non-maternal code (35).

iii. Conclusions and future directions

In sum, this review has shown that across several conditions, some subgroups of immigrant women experience worse outcomes than their native-born counterparts. The evidence of poorer outcomes among immigrant women seems strongest for GDM; however, there is considerable variation by ethnicity and region of origin. On the other hand, the evidence from the US is not as consistent for postpartum depression. Studies on peripartum morbidity and maternal mortality among immigrants in the US are suggestive of worse outcomes, but inconclusive due to their small number and considerable methodological flaws. A consistent theme throughout the maternal health literature is heterogeneity in risk within immigrant women. This review clearly highlights the importance of differentiating immigrant women by country of birth, time since migration, and other factors that could potentially affect exposures and outcomes. Furthermore, the associations between nativity and various maternal health outcomes might not be static across time, as changes in immigration policy and the socio-political climate and population health in sending countries affect the demographic composition and health status of migrants entering the US. There is a need for richer and larger data sets that allow for stratification by important immigration-related factors.

Interestingly, the findings of this review are in sharp contrast to the better outcomes generally observed among infants born to immigrant mothers. However, it is important to note that the observed

health advantage found in perinatal (e.g. low birth weight, perinatal mortality) and other health outcomes among immigrants might be confounded by changes in immigration policy (e.g. stricter health requirements for entrants) [14] or modified by time since migration. On the other hand, infant outcomes typically associated with the maternal conditions reviewed here (e.g. macrosomnia for GDM, birth injury for perineal laceration) are under-studied in immigrant populations (thus, it is not known whether infants born to immigrant women fare worse on these particular outcomes). A complex, constellation of contributing factors potentially affect maternal outcomes and differences in outcomes between immigrant and native-born women. Clearly, immigrants may face multiple challenges during migration and in adjusting to life in a new country (44, 46). These myriad challenges might compromise their health specifically during the vulnerable period of pregnancy and might interact with pre-existing biological susceptibility and psychosocial morbidities. Lastly, a glaring gap in this literature is the dearth of studies of maternal mortality among immigrant women from less developed regions conducted in the US. Since maternal mortality in developed nations is considered a barometer of the social and economic environment and the quality and responsiveness of the health care system, differential outcomes by nativity status are likely, as has been observed in several European studies. Research has documented well-known differences between immigrant and native-born women's access to health care and their social and economic resources and support, it is thus imperative to examine maternal mortality within immigrant groups and between immigrants and native-born residents in the US.

II. CHRONIC STRESS AND BIRTH OUTCOMES

i. Review of the literature

a. *Key concepts and definitions*

Given the high prevalence of adverse birth outcomes, such as preterm birth (PTB), small for gestational (SGA) and low birth weight (LBW), and their potential impact on long-term health, contributing factors to these birth outcomes have received considerable attention. Psychosocial stress has been widely recognized as a potential risk factor for multiple adverse birth outcomes (52). Stress is a multidimensional construct that consists of three component parts: the stressor, appraisal of the stressor, and response to the stressor (53-55). In a general model outlining how stress leads to adverse health, stress is conceptualized as an imbalance between environmental demands (both acute and chronic) and individual resources (e.g. personality, financial conditions, social support). This imbalance leads to increased stress perception and maladaptive emotional response, such as anxiety and depression. In turn, maladaptive emotional response leads to behavior change and increased risk of adverse health events (53, 55). In this model, stress is viewed as a person-environment transaction (54).

Initial studies of the impact of stress on birth outcomes, typically defined stress as stressful life events during pregnancy. However, there are a couple of disadvantages to this definition. The frequency of stressful life events in pregnancy is low and their effects cannot be easily disentangled from those of chronic stress (52, 56). Furthermore, chronic and daily stressors seem to be more predictive of poor health conditions than one-time, infrequent life events (57). For these reasons, in recent years, researchers have broadened their definitions of stress to include chronic stress. Chronic stress is measured by multiple exposures including anxiety and depression, household strain, daily hassles, pregnancy-related anxiety and intendedness, racism/discrimination, neighborhood context, and stress of acculturation (52, 53, 56). The proceeding literature review will focus on non-contextual and contextual stressors.

b. *Theoretical models linking stress to poor birth outcomes*

Three models detailing the biological mechanisms by which stress affects birth outcomes predominate the literature: neuroendocrine response, immune suppression, and allostasis. One model

describes neuroendocrine responses to stress as follows: external stressors trigger the release of corticotropin releasing hormone (CRH), frequently referred to as a mediator of stress response. CHR stimulates adreno-corticotropin hormone, which in turn stimulates cortisol production (52). Placental CHR gene expression is stimulated by maternal plasma cortisol and can regulate delivery late in pregnancy, while glucocorticoids seem to link prenatal stressors and birth weight and intrauterine growth (58). In the second model, maternal stress may induce suppression of maternal immune function (58). Impaired immunity may result in maternal infections, such as bacterial vaginosis, which can trigger early, spontaneous delivery (53). The third, allostatic model posits that accumulation of stressors over the life course (i.e. lifelong chronic stress) impairs the body's physiological functioning. Allostatic load is assessed via biological markers of stressors and stress response over the life course. High allostatic load or allostatic overload refers to a situation in which the body's response to stressors is no longer adaptive and negatively impacts somatic functioning over time (52, 59). Normally, the body's release of cortisol shuts down the acute stress response; however, with chronic exposure, the stress response fails to shut down and blood cortisol levels are perpetually high. Chronic stressors, such as low socio-economic status, racism, and trauma, may all lead to high allostatic load and ultimately poor birth outcomes (52). Related to the allostatic load model, the weathering hypothesis posits that ongoing social and economic inequities (e.g. discrimination, residential segregation, life adversity) result in premature aging and deteriorating among Black women, leading to growing racial disparities in adulthood (60, 61). In this model, maternal age interacts with social and economic factors to produce poor perinatal outcomes amongst groups experiencing socio-economic inequities (60).

c. *The effects of chronic stress on preterm and low-weight birth*

Non-contextual chronic stress: Studies of non-contextual, chronic stress have employed a plethora of exposure measures including household strain, perceived stress, lack of control in daily life, childhood trauma, social support, and pregnancy anxiety. These studies are quite heterogeneous in terms of their conceptualization and operationalization of chronic stress, as well as in their sampling and analytic methods (see limitations section). Nevertheless, most of the studies show positive associations between

measures of chronic stress and adverse birth outcomes; however, the effects of chronic stress are usually attenuated partially by adjustment for other pertinent factors (e.g. socio-demographic, obstetric).

Studies in the US using mostly low-income samples have found positive associations between chronic stress and adverse birth outcomes (62, 63). In a matched case-control study of singleton births to women residing in Los Angeles, high chronic stress was associated with a 50% increased odds of PTB (aOR=1.5 95% CI 1.1-1.9) in a multivariable analysis controlling for age, race/ethnicity, marital status, and paternal support. Ghosh and colleagues found significant multiplicative interactions between nativity and chronic stress and between paternal support and chronic stress. High levels of chronic stress were significantly associated with increased odds of PTB in US-born Latinas but a non-significantly increased odds of PTB in immigrant Latinas (p=0.17 for the interaction term) [note: the authors did not present absolute values of PTB in US-born and foreign-born participants]. Similarly, among those reporting little to no support from the baby's father, high levels of chronic stress were associated with a significantly increased odds of PTB, while there was no significant increased risk of PTB associated with chronic stress among those with moderate to higher paternal support (p=0.14 for interaction term) [62]. These findings suggest that there might be important subgroup differences in the relationship between chronic stress and adverse birth outcomes. Alternatively, residual confounding of chronic stress might exist in certain subgroups.

Another US study conducted with a longitudinal cohort of TANF participants in Illinois found positive associations with various chronic stressors and LBW. Bryant-Borders and colleagues used a multi-dimensional measure of chronic stress, segmented into four components: 1) external stressors (e.g. food insecurity, child with chronic illness, unemployment); 2) buffers of stress (e.g. social support, coping skills); 3) enhancers of stress (e.g. depression, need for mental health treatment in past year); 4) perceived stress (e.g. economic hardship, self-rated health). In separate multivariable analyses adjusted for maternal age, food insecurity (aOR=2.6, 95% CI 1.7-3.5), child with chronic illness (aOR=3.1, 95% CI 2.3-4.0), unemployment (aOR=3.7, 95% CI 2.7-4.7), and poor coping skills (aOR=4.0, 95% CI 3.1-4.9) were all associated with LBW. These findings indicate that among a low-income sample of women, both chronic

stressors and compromised coping skills (suggesting lack of stressor buffering) are associated with LBW (63).

Contextual chronic stress: More recently, examination of chronic stress has been extended to contextual factors, such as racism/discrimination and neighborhood safety. The few studies that have examined contextual, chronic stressors have found a *relatively* consistent pattern of positive associations with poor birth outcomes. In a seminal article on racial disparities in LBW, Geronimus used age as a proxy for chronic psychosocial stress (i.e. cumulative stress exposures over the life course) to explore the weathering hypothesis among Black and White Michigan women of reproductive age. Geronimus found that the size of excess LBW among Blacks compared to Whites was higher in the young and middle adulthood than it was in the teenage years. Furthermore, the proportion of 'high-risk' pregnancies increased more steeply with age among black women than among white women. Among black women, Geronimus found a more graded effect of age on birth weight among women of lower socio-economic status than higher socio-economic status (at the highest socio-economic status, there was no significant relationship between age and LBW). The findings suggests a differential relationship between age and birth weight among black and white women, largely due to differences in distributions of preconceptional maternal health characteristics. Among black women, economic difficulties stemming from social inequity may be related to adverse outcomes (61). Together, the findings seem to suggest that there is a weathering effect, using advancing age as a proxy measure, on health among black women. Similar studies that have been conducted in New York and Chicago have found age-gradients in poor birth outcomes among Black women related to differences in socio-economic risk factors (60).

In a more recent study, Parker-Dominguez and colleagues examined the roles of stress due to racism, general stress and pregnancy-related stress in racial disparities in birth weight among women with singleton pregnancies recruited from a large medical center in Los Angeles county. The authors used multiple measures of chronic stress, including racism, allowing for comparisons of the independent effects of various sub-components of chronic stress. Racism was measured as perceived personal and vicarious (i.e. through a close family member or friend) racism in childhood and adulthood. In a

multivariable model controlling for medical risk, gestational age, recruitment site and parents' education level, perceived lifetime racism was marginally associated and childhood vicarious racism was strongly associated with birth weight. Neither general stress (measured as perceived stress and stressful life events during pregnancy), nor pregnancy-related stress (measured as anxiety about pregnancy and pregnancy intendedness) was independently associated with birth weight in this model. Interestingly, only childhood vicarious racism was independently associated with birth weight, underscoring the importance of considering the timing of exposure (64). Clearly, there may be sensitive periods in which the effect of racism might be more predictive of adverse health.

Chronic stress related to neighborhood context may also play an important role in adverse birth outcomes. Relatively few studies have focused on the neighborhood-related stressors (i.e. stressors that stem from the physical or social environment of a neighborhood). Neighborhood-related stress is commonly operationalized as group-level measures of socio-economic disadvantage, racial/ethnic composition and stratification, as well as disorder (e.g. crime), deterioration, and access to neighborhood resources (e.g. number of outdoor places for recreational activities) [65,66]. The few that have examined these relationships have found somewhat inconsistent results (66). For example, a multi-level study using South Carolina PRAMS and US Census data, examined the relationships among neighborhood context (measured as % living in census tracts under the federal poverty line, racial composition, household crowding, and neighborhood education level for adults), stressful life events, and PTB and LBW. The authors found that neighborhood contextual factors were independently associated with PTB and LBW when controlling for maternal demographic characteristics; however, the significance of the effects of the neighborhood factors differed between the two outcomes. Neighborhood high poverty, predominantly African-American neighborhood, household crowding, and low neighborhood education level each were associated with LBW via mediation by stressful life event domain, when controlling for maternal demographic covariates. Only predominantly African-American neighborhood and the lowest neighborhood education level were associated with PTB via stressors. For both LBW and PTB, the addition of stressful life event domains to models with maternal covariates strengthened the associations

between the aforementioned neighborhood contextual factors and LBW/PTB. Lastly, neighborhood contextual factors modified the relationship between stressful life events and LBW/PTB: a significantly stronger association between maternal stress and adverse birth outcomes was observed among mothers living in less advantaged census tracts, pointing to a possible role through which social and other physical resources mitigate stressors within neighborhoods (66).

Another study conducted among a low-income sample of women delivering at one hospital in Baltimore, examined the relationship between structural neighborhood disadvantage (using a neighborhood risk index) and birth weight and the potential mediating effects of psychosocial (social support, locus of control, chronic stress due to daily difficulties and demands during pregnancy), behavioral (substance use, timing of prenatal care) and biomedical (hypertension, infection, pre-pregnancy weight and weight gain) factors. The neighborhood risk index included racial and economic stratification, social disorder (violent crime rate per 1000 residents) and physical deterioration (% boarded up houses). In multilevel models, neighborhood risk was associated with LBW when controlling for individual socio-demographic factors (the base model). When potential mediators were sequentially added to the base model, psychosocial factors reduced the effect of neighborhood risk by 12%, behavioral factors reduced the effect by another 30% (the association was no longer significant), and biomedical factors reduced the risk by another 10%. These findings might suggest that the neighborhood context is associated with birth weight, when controlling the effects of individual socio-demographic factors, but that behavioral factors accounted for the largest proportion of observed neighborhood risk effect on birth weight. In contrast, psychosocial factors were not independently associated with neighborhood risk and their mediating effects on the neighborhood risk-birth weight relationship were relatively weak (65); however, psychosocial factors might also impact the behavioral factors examined in this study. This last finding could be due to imprecisely measured stress variables (66).

In sum, both studies found independent effects when controlling for individual-level demographics; however, they were inconsistent on mediation by other types of stressors. One study identified acute stressors as potential mediators, and the other study found psychosocial stressors (e.g.

social support, locus of control) to be only weakly mediating. The different stress definitions and measures (one study used acute stress measures and the other used chronic stress measures) could account for differences in mediation.

ii. Limitations

Several limitations in the chronic stress and adverse birth outcomes literature exist. Chief among these limitations, due to its broad implications on comparability of studies, is heterogeneity in definitions and operationalization of chronic stress (52, 55-57). As one can glean from the review of the literature, numerous sub-components and different relationships between and among the sub-components of chronic stress are explored. While it is widely recognized and articulated that chronic stress is a multi-dimensional construct, in practice, most researchers either do not or are not able to examine multiple sub-components of the construct of stress. Specifically, few studies have utilized measures corresponding to the three main components of the stress model: stressors, appraisal, and response. Studies that employ single measures of specific sub-components of the stress model lack content validity. Within the literature, examination of external stressors seems be slightly more common than examination of perception/response to stressors (perhaps because these latter sub-components are not as well defined or easily measured). However, stressors cannot capture how individuals perceive or respond to stress (whether they use coping mechanisms, change behavior, experience depressed mood etc). In the general model of stress, appraisal and response are critical steps along the pathway to adverse health outcomes (see Appendix); they are intermediaries between the occurrence of external stressors and the ultimate change in health status or outcome. Another drawback of single measures is the inability to examine the relative contributions of specific stressors or sub-components of the stress model. Researchers also implicitly employ different definitions of chronicity. For some, chronic refers to the entire duration of pregnancy; for others, it refers to the life course from early childhood to adulthood.

The use of small and non-random samples is another limitation. Relatively few studies have used random or population based samples of mothers and infants; most use convenience sample drawn from highly selected populations from prenatal clinics and hospitals. In small samples, it is certainly harder to

detect small associations. Residual confounding is a significant concern even when researchers use multivariable analysis and sufficiently sized samples. Smoking, for example, is a strong risk factor for PTB, LBW, and SGA. Lack of adjustment for smoking could lead to spurious associations. On the other hand, some see smoking and other health behaviors as mediators in the stress model; in this case, the extent to which smoking contributes to the association between stress and birth outcomes needs to be taken into consideration (55, 57). Seldom examined, weight gain and energy expenditure are two variables that could confound the relationship between stress and poor birth outcomes, particularly the relationship with LBW (52). Examination of the role of social support is also important in the study of effects of chronic stress because of the strong buffering effect of social network and type of support. Social support can reduce stress levels, facilitate the adoption of healthy behaviors, and provide materials and resources to the pregnant women (52). Social support may mediate or moderate the association between chronic stress and birth outcomes (depending on the underlying causal model).

Stress is certainly not a random exposure, as it is not evenly distributed within a population. Stressors, both chronic and acute, tend to concentrate in the most marginalized strata of the population (e.g. low socio-economic status and low social position). Subgroups within a population might have highly different probabilities of being exposed. Consequently, even when stressors are well measured, it is difficult to disentangle the effects of stress, including low-social support, from the effects of low social status and economic hardship (see section iv for study designs/methods that address this issue).

Timing of exposure assessment is an important consideration in stress studies (55). Even though the studies reviewed here measured *chronic* stress, most assessed the exposure at one time point (i.e. cross-sectionally). Most did not employ repeated measures throughout pregnancy, and thus could not assess for changes in associations across time. Furthermore, one-time postpartum assessment can lead to recall bias. For example, women who have experienced an adverse birth outcome may be more likely to recall chronic stress and attribute it to the birth outcome. Differential recall can lead to differential misclassification of the exposure and consequently spurious positive associations between stress and poor birth outcomes (55).

iv. Conclusions and future directions

Ultimately, different methods and definitions/measures of stress make it difficult to digest these studies as one cohesive, comprehensive body of literature. Nevertheless, a pattern of positive associations between chronic stress measures and poor birth outcomes is emerging. Both direct effects and effects through mediation by health-related behaviors such as smoking have been observed. The studies reviewed here had relatively consistent findings for non-contextual stress/stressors. Significant positive relationships between chronic stress and PTB/LBW were found for both general measures of chronic stress (i.e. perceived stress scores), as well as more specific dimensions for stress (e.g. food insecurity, unemployment). Studies that have employed multidimensional measures of chronic stress have the advantage of being able to disentangle the effects of various subcomponents of the stress construct. These studies have found that the strength of the association between stress and PTB/LBW differ among subcomponents. Most of the non-contextual stress studies used low-income samples. While restriction is one strategy for minimizing confounding by SES, it also limits generalizability to mixed income populations.

Studies of contextual chronic stress suggest positive relationships between racism/discrimination and neighborhood context and poor birth outcomes, even after controlling for individual socio-demographic factors. The independence of the neighborhood contextual stressors was a major conclusion for both studies reviewed here. However, discussions of the independence of effects should be nuanced by the fact that neighborhood factors have to operate through individual level variables in order to impact individual-level health outcomes (65). Several questions remain. One question is whether the effect of non-contextual stress is similar in general, mixed income populations (with attention to potential confounding effects of SES, social support etc), since studies of non-contextual stress in the US to date have restricted their samples to low-income groups. Another question is whether the effects of chronic stress differ by outcome (PTB v. LBW), as has been shown in studies outside of the US (57). The effect of different subcomponents of chronic stress differed between outcomes in one study conducted among a

population-based sample of South Carolina women, the only study to examine both LBW and PTB simultaneously (66).

Researchers must be explicit about their definitions and conceptualizations of chronic stress and mindful of the potential limits of the actual measures that are used to reflect the underlying construct. To achieve adequate construct and content validity, future studies should employ multiple measures of stress, preferably measures that tap into each of the sub-components of Lazarus' model of stressor, appraisal and response. Combining measures will allow for a more comprehensive and robust operationalization of the construct of chronic stress (i.e. better construct validity) and ultimately for a more powerful test of the relationship between chronic stress and birth outcomes (55). Future studies should incorporate measures of social support and coping and test for potential mediation/effect-measure modification by these variables.

There is also a need for more longitudinal studies and datasets (57) that can better establish temporal patterns in the relationships between stress exposures and outcomes. Furthermore, several studies have suggested that timing of stress exposures over the life course (64) and across micro time scales (i.e. across pregnancy-see 67) are important. Longitudinal designs might allow for a more comprehensive examination of the effect of the timing of exposure. In addition to accumulation of stress, critical periods of stress should also be considered (e.g. stress in childhood might have a different impact on birth outcomes than stress during adulthood). A consideration of critical periods necessitates the collection of repeated measures of stress exposures over the life course.

Another key issue in the study of chronic stress and birth outcomes is the uneven distribution of the exposure in the population; propensity score methods might help to overcome some of issues with confounding and independence of stress exposure and other risk factors (e.g. socio-economic disadvantage). The propensity score is the probability of being exposed for a participant conditional on the participant's pre-exposure covariates. Propensity score methods correct imbalances between exposures groups that limit exchangeability and remove the association between exposure and confounder. Researchers can then make inferences about observed differences in outcomes, based on the

assumption that differences are due to exposure alone (68). Since the covariates must predate the exposure, this method might be most applicable to studies of chronic stress during pregnancy.

III. GENERALIZED LINEAR MODEL FOR CATEGORICAL RESPONSE DATA

i. Description of method

a. *Overview*

Generalized linear models (GLMs) are a general class of models for observations that are independent. GLMs consist of three components: 1) the random component which identifies the response variable and defines its distribution (e.g. binomial); 2) the systematic component which identifies the explanatory variables (linear predictors); 3) the link function which specifies the function that links the random (the mean of the outcome's probability distribution) and systematic components (the linear predictors) (69, 70). The selection of the type of GLM depends largely on the nature of the categorical response variable (e.g. ordered, binary, or an event count). The GLMs for categorical responses reviewed here include logistic regression, Poisson regression, and cumulative logit regression.

b. *Summary table of regression models for categorical response variables*

Model	Nature of outcome	Distribution	Link	Key Assumptions
Logistic	Log odds of a binary variable	Binomial	Logit	- Linear relationship between the log odds of the response and continuous explanatory variables (71, 72) - Requires large sample for valid inferences (69)
Poisson	Log mean of a count variable or log of the rate [mean/index of size (e.g. time, space)]	Poisson	Log	- The mean equals the variance (70) - Requires large sample for valid inferences (69)
Cumulative logit	Log odds of being at or below a certain category of the response variable for two different levels of the explanatory variable (when the explanatory variable is binary) (74).	Multinomial	Cumulative logit	- The same proportionality constant applies to each cumulative probability; log odds does not depend on response category (70,73) - Requires large sample for valid inferences (69)

c. *Testing the model assumptions*

The models described above have several important assumptions that should be tested before or during model building. In general, if the assumptions are violated, estimates and standard errors might not be valid. In logistic regression, a key assumption is a linear relationship between the log odds of the response and continuous explanatory variables (71, 72). This relationship can be examined visually by graphing the exposure and outcome (e.g. a scatter plot of the exposure on the x-axis and the outcome on the y-axis or a lowess plot of the smoothed logits). If there is a non-linear relationship between the exposure and outcome, then the explanatory variable should be transformed. For example, say the exposure variable, age, is not linearly associated with GDM (i.e. the GDM risk is low-moderate at young

age, decreases slightly in the early 20s, increases slowly in late 20s-early 30s and then increases more sharply in the mid-30s and beyond), age should be transformed. Common transformations are dichotomous (e.g. median split), polytomous (e.g. 5-year age groups), and quadratic forms (e.g. age-squared). The AIC values corresponding to the models with each form of the exposure variable can be compared (with the lowest AIC value supporting the best fit for the model to the data). Alternatively, one could re-plot the exposure and outcome and examine the shape of the plot to check for normality.

A key assumption of the Poisson regression model is equality between the mean and the variance. However, frequently data vary more than if the Poisson distribution were truly applicable. Data that have larger variability than would be expected in a true Poisson distribution are overdispersed. In the presence of overdispersion, the standard errors for the parameter estimates are underestimated and the confidence intervals are overly narrow. Heterogeneity among observations is a common cause of overdispersion. Negative binomial regression can be applied in a situation in which the variance is greater than the mean. This model has an extra parameter for overdispersion and thus allows the variance to exceed the mean. (70). To test for overdispersion, one should calculate and compare the sample mean and variance at each level of the exposure variable (if categorical) [70]. Alternatively, one could apply a likelihood ratio test to a Poisson model and a negative binomial model, as follows: -2LL(poisson) -2LL (negative binomial), where LL=log likelihood. If the likelihood ratio test statistic is significant, then the null hypothesis (i.e. the mean=variance) can be rejected; the variance does exceed the mean and the negative binomial model should be used (75).

Lastly, large sample theory requires that the overall sample be reasonably large as data are assumed to be representative of some larger population in a simple random sampling frame. Testing and inferences require sufficiently large samples so that the parameter estimates are normally distributed and the statistical tests follow chi-square (for likelihood ratio tests) and normal distributions (for Wald tests) [73]. Violations, such as small samples and highly skewed table margins, might lead to erroneous estimates and inference (69). One central question is: are there adequate data to fit a multivariable model? Determining the adequacy as the data involves an examination of number of events per covariate (see

next section on model building) [73]. In addition, one can calculate a rough estimate of the necessary sample size for a multivariable regression by dividing Hsieh's formula for one-sided tests by the estimated association between the exposure and covariate(s) of interest. However, this formula relies on crude estimates of the magnitude of the exposure-confounder association as well as the size of the effect (e.g. odds ratio) in Hsieh's formula (70, 73). When large sample size assumptions are violated, one can apply conditional exact or bootstrapping methods (involving repeated sampling from the study population) [69].

ii. Model building

A multiple regression model allows for the examination of the relationship between a response variable and more than one explanatory variable. In such a model, the parameter beta refers to the effect of the main explanatory variable on the log odds of the outcome occurring, holding constant the other explanatory variables in the model (70). Model building is a process that involves the selection of covariates and assessment of the adequacy of the multivariable model in regards to its individual variables and its overall fit (73).

There are two main issues in variable selection: how many covariates and which covariates to include in the model. There is a limit to the number of explanatory variables to include in any model. When data are unbalanced on the outcome (i.e. when there are very few observations with disease or with no disease), the number of explanatory variables that the model can estimate accurately is reduced. Consequently, the estimates might be biased and the standard errors poor (i.e. sparse data bias). As a general rule, there should be 10 observations for every covariate in the model (70).

Determining which variables to include in a model is central to model building. Variable selection should be guided by theory regarding the underlying causal model (shaped by the existing literature) as well as by statistical assessment. Therefore, one might include covariates that have been identified in the literature as potential risk factors for the outcome and believed to be associated with the exposure regardless of their statistical significance. This approach provides a more complete control of confounding compared to selecting based on significance alone (73). Statistical assessment of the

covariates should include bivariable analyses, in which the relationships between the covariate and exposure and the covariate and outcome are determined. Covariates that have a statistically significant relationship with the exposure in the source population and with the outcome among the unexposed, but which are not thought to be in the causal pathway nor a common effect of the exposure and the outcome, should be included in the model [this assessment approach adheres to Rothman definition of a confounder (76)]. After variables have been selected and the multivariable model fitted, each covariate should be examined for its significance (i.e. confidence intervals and p-value for the Wald test) and the change in the estimated coefficients of the main exposure of interest and the covariate from the model with only that covariate to the multivariable model (73) and the change in the coefficients from the crude to the multivariable model.

As an example, in a study of nativity and postpartum depression, bivariable analyses are performed, as described above with all potential confounders (including age, socio-economic status, race/ethnicity, parity, marital status, labor complications). Covariates for the multivariable model are selected that meet the confounder criteria described above, as well as any covariates known from the literature to be associated with postpartum depression. In this example, the bivariable analyses showed that age, socio-economic status, race/ethnicity and labor complications were significantly associated with both nativity status and postpartum depression at alpha-level of 0.05-these variables are selected for the multivariable model. In addition, marital status is selected based on subject knowledge (and to improve comparability with previous studies), even though it had a non-significant association with postpartum depression in the sample (77). Once the preliminary model has been fitted, one would examine the covariates more closely and consider the removal of covariates from the multivariable model that are non-significant and/or show no appreciable change in the estimate of the exposure-outcome relationship from the crude to adjusted model (73). However, there are situations in which one might retain covariates whose presence does not show an appreciable change in the exposure-outcome association if they are thought to be clinically important or are consistently included in previous studies (for comparability).

An important issue that arises in model building is multicollinearity, which results when two or more explanatory variables that are correlated with each other are entered into the model. Multicollinearity can result in null associations between the explanatory variables and outcome because of the overlap with other explanatory variables in the model. It will also inflate the standard errors of parameter estimates (70); the confidence intervals will be wider and type II errors may result. To address multicollinearity, one should first confirm that there are no obvious errors (e.g. incorrect dummy coding). If the covariates are thought to tap into one underlying construct, then one might create a sum or scale from the covariates. Another option is to drop variables; one covariate might be chosen to represent the construct (78). An example of a set of multicollinear variables is maternal education, paternal education, and household income. These variables are likely to be highly correlated with one another and reflect the larger construct of socio-economic status or social position. However, if there is evidence of multicollinearity (e.g. inflated standard errors, high correlation among the variables), one might choose one to represent the underlying construct of socio-economic status. Alternatively, one could create an index as Huang and colleagues did in their study of depressive symptomatology in US-born and immigrant women. Their index consisted of the three components: paternal education/occupation, maternal education/occupation, and household income. The index was a 5-category ordinal variable (categories represented quintiles of the SES index) [26].

Similarly, interaction terms add complexity to the model and can reduce precision and accuracy in the parameter and confidence interval estimates. In typical epidemiological studies, the power to detect interaction effects will be an order of magnitude less than the power to detect main effects. Consequently, there is more variance in interaction estimates than variance in estimates of main-effects alone. Larger study samples are necessary to study interaction effects (79). Greenlander has shown that failure to reject additive or multiplicative models (i.e. erroneously concluding that there is no additive or multiplicative interaction) is common in studies with small to moderate sized samples (79). In these cases, spare-data or exact methods, such as conditional maximum likelihood, should be used (76).

iii. Application to topical areas

As noted by Preisser and Koch, public health research is often concerned with the relationships between a categorical response and one or more explanatory variables (69, 72). In a multi-causation framework, the importance of modeling that can accommodate multiple explanatory variables is apparent. Clearly, the outcomes examined in the previous topical sections-postpartum depression, gestational diabetes, peripartum maternal morbidity, maternal mortality, and key birth outcomes (e.g. preterm birth)-are thought to arise from a complex and dynamic constellation of potential causes. Not unexpectedly, much of research in these areas utilizes multiple-regression modeling to elucidate the multiple relationships between and among various risk factors and the periconceptual outcomes of interest. Second, most research studies in maternal and child health use observational designs. Observational studies are common in maternal and child health due to the logistical and ethical concerns surrounding randomization of exposures in pregnancy. Adjustment for inherent differences in comparison groups is especially important in observational studies that lack randomization (72). Adjustment for confounding is a necessary component of maternal health research because of the strong effects of certain immutable maternal characteristics, such as parity and age at first birth, on maternal and infant health outcomes. These maternal characteristics are usually not the main explanatory variables of interest and they introduce non-equivalence in comparison groups.

IV. ASSESSMENT OF INTERACTION/EFFECT-MEASURE MODIFICATION

i. Definition of interaction/effect-measure modification in epidemiology

Epidemiologists use the term effect-measure modification to indicate a situation in which the association between an exposure and an outcome varies across different strata of a third exposure (80). In other words, exposures interact with one another when one modifies the effect the other has on the occurrence of disease (81). A key concept in interaction/effect measure modification is how the two exposures interact with one another. Qualitative effect-measure modification refers to average causal effects in the strata of the third variable that are of opposite direction (e.g. in Z=1, the risk ratio is > 1.0; in Z=2, the risk ratio is < 1.0). When there is qualitative effect-measure modification, multiplicative effect-measure modification implies additive effect modification and vice versa. However, when there is quantitative effect-measure modification (i.e. the average causal effects in both/each strata of the third variable are in the same direction), there can be effect modification on one scale but not the other. This phenomenon is called scale dependence; some authors prefer to use effect measure modification to highlight the dependence on the effect measure used (76, 82).

There are two main concepts of interaction in epidemiology: statistical interaction and biologic interaction. Statistical interaction (most akin to definitions of effect-measure modification-see Rothman) typically refers to the inclusion of a product term (main exposure x third variable) in a statistical regression model. Common criticisms of statistical interaction are that it is disconnected from the underlying causal models on the biological level and that it is completely dependent of the type of statistical model that one uses (i.e. a log-linear model could show no evidence of interaction, whereas the equivalent linear model could show evidence of interaction) [79]. Biologic interaction takes into account underlying causal effects (in contrast to statistical interaction which refers to association whether causal or not [76]). There are two related definitions of biologic (causal) interaction based on the sufficient component cause model and the counterfactual model. Biologic interaction within the sufficient cause framework refers to two component causes co-existing within a sufficient cause; the causes act together in the same causal mechanism and there is synergism between the two (83). Utilizing the counter-factual

framework, there is interaction between two treatments (or exposures in absence of randomization), A and E, if the causal effect of A on the outcome, Y, after a joint intervention that sets E to 1 is different from the causal effect of A on Y after a joint intervention that sets E to 0 (82).

ii. Assessment and measurement of interaction

Several methods for assessing interaction exist. Stratification is the natural, first step to identify interaction/effect measure modification. One examines the magnitude and direction of the association between the exposure and outcome in each level of the potential effect modifier (before adjusting for any potential confounders) (82). In multivariable analysis, the test for product term (main exposure x third variable) is a common method for assessing statistical interaction. The Wald-test tests whether the beta coefficient of the product term is statistically different from zero (if so, then there is evidence of interaction on either the multiplicative or additive scale depending on the type of regression model used). The likelihood ratio test assesses whether the fit of the model with the product term is significantly better than fit of the main effects model without the product term (84).

In addition, several measures of additive risk within multiplicative models, such as logistic or Poisson, have been proposed: the relative excess risk due to interaction (RERI), attributable proportion due to interaction (AP), and the synergy index (SI). The RERI is calculated as the difference between the expected effects based on the addition of the individuals effects of the two exposures of interest and the observed effect in the joint exposure category (85). If the effects of the exposures are monotonic (i.e. the exposures never prevent disease), a RERI >0 implies sufficient-cause interaction. If monotonicity cannot be assumed, a RERI >1 implies sufficient-cause interaction (83). Interpreted as the proportion of events that is due to interaction, the AP is calculated as RERI divided by risk ratio in the joint effect category. The SI is interpreted as the excess risk from exposure to both exposures when interaction is present relative to the risk from exposure when interaction is not present (85). It is important that authors clearly indicate the assessment of additive and/or multiplicative interaction and the underlying scale of the model (e.g. log-linear vs. linear model).

iii. Additive vs. multiplicative interaction

Interaction can be assessed on an additive or multiplicative scale. For example, when the amount that the main exposure, X, multiplies the risk is less in one stratum of a third variable, Z, than in another, then there is said to be effect modification on the risk ratio scale (i.e. multiplicative scale). If the risk differences for the main exposure change across levels of a third variable, Z, then there is said to be effect modification on the risk difference scale (i.e. the additive scale); the combined effect of the main exposure, X, and the third variable, Z, on risk is greater/less than the risk computed by simply adding the separate risk differences for X and Z alone (76). Other measures of additive and multiplicative interaction utilize the risk ratio as follows: in an additive model, the amount of change in the main exposure, X, from x=1 to x=2, is measured by the amount that the change *adds* to the RR; in a multiplicative model, the amount of change in the main exposure, X, from x=1 to x=2, is measured by the amount that the change *multiplies* the RR (86).

Many believe that the additive model is of greater public health importance because of its ability to identify subgroups that would most benefit from intervention (81, 87). Departures from additivity (i.e. non-additivity of the risk differences) indicate the group in which the greatest *absolute* risk reduction would occur, which may or may not be the group with the highest risk group (87). Similarly, many suggest that additive interaction is most aligned with biologic interaction. Non-additivity of risk differences implies the presence of interaction types-where we cannot say what the effect of one exposure would be without knowing the value of the other exposure-or causal interdependence (76, 80).

iv. Recommendations and rationale for testing interaction

The assessment of interaction in epidemiology has spawned significant debate regarding its appropriate application and reporting in research studies and the non-correspondence between concepts of statistical and biologic interaction. Nevertheless, it is important to test for statistical interaction because of its enhanced ability to detect effects and prediction of disease based on individuals' risk profiles, as well as its practical implications for targeting interventions (81). Sound techniques should be applied when testing for interaction. The following recommendations for detecting 2-way interaction are presented: 1) stratification by the potential effect modifier; 2) building and comparison of a main effects model (i.e. the

multivariable model without any interaction terms) and a model with relevant interactions terms; 3) calculation of an additional measure of interaction such as the RERI or SI with 95% CIs to test for additivity using effect measures from multiplicative models (e.g. logistic regression). Before beginning an assessment of interaction, it is important to have an a priori hypothesis about the underlying causal mechanisms involved and the expected direction of the difference in associations.

Stratification of the bivariable association allows for a brief examination of crude associations in levels of the potential effect modifier. Adjusted stratum-specific estimates should be compared to one another, with attention to both their magnitude and direction. Though stratification is an important first step, formal tests for interaction-the most appropriate statistical test for heterogeneity between or among subgroups-are necessary. The main effects model should be built including all relevant covariate including the potential effect modifier. A second interaction model should then be built with all relevant covariates and an interaction term between the exposure of interest and the effect modifier (i.e. the Wald-test for product term) as well as interaction terms between the confounders and the effect modifier. The latter interaction terms allow one to determine whether there is variation in confounding across strata of the modifier (non-significant terms can be dropped in the final model). The significance of the p-value of the main exposure-effect modifier product term should be assessed, using a p-value of <0.15 to indicate significant *multiplicative* interaction (i.e. deviations from multiplicativity). The likelihood ratio test may be used to compare the fit of the main effects and interaction models (i.e. to test the difference in log likelihood between the two models on their chi-square distributions). A significant p-value (< 0.05) for the likelihood ratio test would indicate that the interaction term is needed in the model. If interaction between the exposure and effect modifier is confirmed, then the results should be presented with a common reference group-the reference group being those not exposure to either factor (88).

Lastly, *additive* interaction should also be tested because of its adherence to theories of causation and ability to identify subpopulations that would most benefit from intervention. A few additive tests for use in models with underlying multiplicative scales have been suggested-the most common being RERI and SI. The RERI has a major drawback when used in multiplicative models, such as logistic regression

models: its calculation is only exact and valid for models that do not include other variables over which the RERI might vary (83, 84). Anticipating that my future analyses will include adjustment for multiple confounders, SI for additivity is the best choice as it is more resistant to variation over confounders (84, 85). A SI of 1.0 would indicate no departures from additivity (in practice, a 95% CI would be calculated and if 1.0 were within the interval, the null hypothesis of non-additivity would be accepted) [85].

v. Application to topical areas

Assessment of interaction is an important component of a comprehensive analysis of both nativity and maternal health outcomes and chronic stress and birth outcomes. As Geronimus points out, risk factors may not operate in the same way across sub-populations (61). In terms of maternal health outcomes in immigrant women, subgroup differences are expected due to the considerable heterogeneity among immigrant women. For example, in Chu and colleagues' study of gestational diabetes among Asian Pacific Islanders, country of origin modified the relationship between nativity and diabetes; in women of Japanese/Korean ancestry, US-born status conferred an increased risk of gestational diabetes, while in every other Asian nationality examined, US-born status conferred a decreased risk of gestational diabetes (8). In addition to country of origin, time since migration is another important potential effect modifier of the relationship between nativity and birth outcomes. Researchers have suggested that not accounting for time since migration can mask disparities in outcomes between immigrant and native-born women (the average effect) and between subgroups of immigrants by time since immigration (90). Within the maternal stress and birth outcomes literature, researchers have suggested that timing and chronicity of stress impacts the magnitude of the association between stress and birth outcomes. For example, stressors that occur before or early in pregnancy might have stronger effects on birth outcomes then stressors that arise later in pregnancy (91). Another potential interaction is between stress and social support, with social support modifying the association between stress and birth outcomes (62). It is important that both factors' independent and joint effects are examined in studies of birth outcomes. Lastly, as noted previously, a main strength in interaction assessment is its application to targeting of interventions. However, few studies in these topical areas have assessed additive interaction.

Community Board Three: Queens Profile Paper II

The population of district 3 of Queens increased to 178, 022 people in 2013.[1] Comprised of three neighborhoods, East Elmhurst, Jackson Heights and North Corona, this district is largely inhabited by Hispanic residents who make up 64% of the population.[1] This community possesses a plethora of assets, such as different denominations of churches, small businesses, several public and private schools and easily accessible public transportation. Nevertheless, District 3 faces a number of public health concerns. The three neighborhoods rank first in percent of adults without health insurance throughout New York City.[1] Thirty-eight percent of the population has no access to health care or preventive services which in turn influences the rate of avoidable hospitalizations in the district as people turn to emergency rooms for treatment. Furthermore, the closest hospital that serves this community is located, in a different district, 20 minutes away on public transportation from East Elmhurst.

One of the needs of Queens Community District 3 is for sexually transmitted disease (STD) clinics and services. Currently, there is only one clinic that serves this purpose in the community and it does not offer any physician services. Likewise, only one walk-in immunization center is present in the community, and thus access for adults is limited.[2] Poor quality diet and physical inactivity are health concerns related to obesity, diabetes and heart diseases. Residents of District 3 consume more sugary beverages than residents of Queens and NYC in general. The community lacks recreational centers, green spaces and healthy food options, enabling sedentary lifestyles and unhealthy food decisions. These behaviors lead to an increased risk for diabetes which is the 7th leading cause of death in the district.[1] Diabetes leads to cases of blindness, amputations and contributes to the community's leading cause of death, heart disease. People with diabetes are more likely to die from the flu and pneumonia, the third

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leading cause of death in District 3 than in? NYC as a whole.[1,3] It is estimated that 1 in every 2 Hispanic/Latino children born in the United States, will develop diabetes in their lifetime.[3] It is an alarming statistic for our community made primarily of Hispanic residents. In this paper, we will address the impact of diabetes in this community and establish program objectives to reduce the burden of this condition in District 3.

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What is diabetes and how can I manage it?

Diabetes is a chronic illness caused by the malfunction of the pancreas. Glucose in the blood prompts the beta cells in the pancreas to secrete insulin that will then transport the glucose from the blood and attaches it to the receptors of the body cells.[4] The New York City Department of Health and Mental Hygiene lists three types of diabetes: Type I (insulin-dependent), Type II (non-insulin dependent), and gestational diabetes.[5] Type I is an autoimmune disease which affects 5-10% of diabetes cases, and while the cause is unknown, it could be due to genetics or environmental triggers.[5-8] With no cure or preventative measures, injected insulin and a restricted diet are necessary for survival.[5-8]

Unlike type I, type II diabetes affects 90-95% of diabetic cases.[4] The cause of this form of diabetes is not definitive but risk factors include obesity, family history of disease, sedentary lifestyle, hypertension, high cholesterol, being older than 45, and being a member of a racial/ethnic minority.[5] If left untreated or poorly managed, complications arise, such as heart attack, stroke, blindness, renal failure, nerve damage, foot infections, limb amputations, and dental disease.[4-8] The estimated 86 million pre-diabetics must make a lifestyle change in order to prevent the onset of disease.[6]

Gestational diabetes is a temporary condition affecting 5% of pregnant women in New York City but will put these women at increased risk for developing type II diabetes later.[5] The

excess blood glucose causes the babies to store more fat, resulting in large newborns that are now at risk for neonatal hypoglycemia, respiratory problems, and obesity.[7,8] Asians, Hispanics, African-Americans, and women that are over 35 and/or overweight are at increased risk.[5] Following birth, women must monitor their diet and remain active to prevent type II diabetes.[7]

Aside from the enormous physical toll, the economic toll is stupefying. In 2012, treating the 29.1 million diabetics in the U.S. – 8.1 million of whom were unaware of their status – cost a total of $245 billion, with $176 billion spent on direct medical expenses, and $69 billion on indirect expenses, such as loss of productivity and disability.[6] Twenty percent of federal health care dollars go towards diabetes care.[5-8] In 2013, the CDC reported that NY had 1,625,044 diabetics, and it costs about $11,744 to treat a single diabetic.[6,8]

As shown in Figure 1, Community District 3 has a diabetes prevalence of 9.1-12.4%.[9] The most alarming fact is the overwhelming impact diabetes has on minorities when compared to White residents. The National Diabetes Statistics Report states that diabetes is much more prevalent among minority groups than whites.[6] According to Table 1, 15.9% of American Indians/Alaska Natives, 12.8% of Hispanics, 13.2% of African American, and 9.0% of Asians have diabetes, as opposed to 7.6% of whites.[6] Among Hispanics, the highest prevalence is in Puerto Ricans (14.8%) and Mexican Americans (13.9%).[6,10] This showcases why a focus on diabetes is imperative, as District 3's majority racial population is of Latino/Hispanic descent.

While there is no cure, type II diabetes can be managed through a healthy diet, frequent exercise, medication, daily monitoring of blood glucose levels, cessation of smoking, controlling blood pressure and cholesterol, and ensuring that feet are dry and free of sores.[5-8] The most crucial component of diabetes management is education. People must understand diabetes and its severity i.e. the high physical and economic cost. High risk groups, such as minorities, should be

tested for the disease. There must be a clear, easy-to-follow plan between physicians and patients on how to manage symptoms and complications. Pre-diabetics and type II diabetics must understand how nutrition and exercise impact this disease. To become wiser consumers, they should inspect nutrition labels, understand the differences between unsaturated, saturated, and trans-fat, avoid highly processed foods, and determine the best exercise regimen that will help control weight. Additionally, when dining outside the home, it is important to inform either the server or the host of this condition.

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Evaluations of New York City Diabetes Interventions

Creating a healthy educational atmosphere is a priority in New York City. In 2010, Mayor Michael Bloomberg created an Obesity Task Force, in response to the growing epidemic and its health effects on residents of the city. This Task Force was made up of eleven city agencies and political representatives and their goals were to combat the rise in obesity in New York City via a number of city-wide initiatives.[11, 12] These initiatives were implemented as intervention methods in an effort to decrease the rise in obesity and to promote healthy living within the city.

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To highlight attempted obesity interventions, we will focus on two interventions executed by the Obesity Task Force. Move-To-Improve, or MTI, was a program that was implemented in New York City public schools to increase the amount of physical activity of students in a classroom setting.[13] The goal was to train Kindergarten through 5th grade teachers on how to integrate physical activities, and therefore physical education, in their classroom. This strategy was created to get children in New York City to the CDC recommended physical activity goal of one hour, or 60 minutes, per day.[13]

In a 2012 study, the efficacy of Move-To-Improve was evaluated over a two-month time period. The program was funded by the New York City Department of Education and the Department of Health and Mental Hygiene. This analysis compared the outcomes of MTI trained teachers versus untrained teachers and how this manifested in the quantity and quality of classroom-based physical activity.[13] Thirty-nine schools were observed, consisting of 150 classrooms. The outcomes of the study were that classrooms with MTI trained teachers had significant increases in physical activity.[13] A critique of the MTI program was that it was not cost effective due to the amount of schools in New York City, all with varying financial and educational needs. This highlights the main limitations of this study – which are tied to the difficulty of implementing a city-wide public school program due to cost?.[13]

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Another program implemented was the "New York City Green Cart" initiative, in 2007, which aimed to bring fresh produce into low-income neighborhoods, as well as creating jobs for residents of the community.[11,14] The program is comprised of 500 fresh produce vendors that are located in nutritionally underserved communities. There are 1000 Green Cart permits for all five boroughs of New York City, 100 of them located in Queens. In the press release for the announcement of the initiative, Health Commissioner Dr. Thomas Frieden said, "In some neighborhoods, rates of obesity and diabetes are 50 percent higher than the citywide average. To tackle this problem, and help prevent diabetes, heart disease, and cancer, we must change our environment and make healthy food more available".[14] This program was created to tackle the growing prevalence of obesity and diabetes in New York City.

The goal of the Green Carts program was to target neighborhoods with 'food deserts' or little access to fresh produce. Additionally, these neighborhood designations were in low-income communities due to the relationship between obesity, diabetes and other nutrition related

diseases and high poverty rates. Although there were many successes in regard to the outcome of the initiative, which is still operational, one particular limitation needs assessment. Several hundred Green Carts are scattered over the five boroughs, however, some neighborhoods in need of access to fresh produce are underserved, especially locations near public housing.[15] The city is still committed to the Green Carts program and strives to bring fresh fruits and vegetables to communities in need.

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Effective programs promoting healthy foods within bodegas would increase communal access to fresh produce and make it much easier for residents to lead healthier lives. Bodegas are often less likely to have fresh produce and are instead loaded with convenience items that are high in calories.[19] An example of a healthy bodega program is the Healthy Bodegas Initiative in NYC, which has been successful in over 1000 bodegas in neighborhoods with high poverty rates.[19] Providing store owners with monetary incentives and recommendations for stocking and promoting healthy foods, guidelines for interacting with customers, and nutritional education would lead to an increase in purchases of healthy foods.[19] Implementing this program in community District 3 would provide residents with greater food accessibility and help reduce incidents of health diseases such as diabetes.

Program Objectives

The American Diabetes Association suggests comprehensive diabetes assessments for diabetics, including a physical examination, medical history, laboratory tests, and regular eye and dental care.[16] Census records show a surge in the amount of foreign-born residents from 2000-2011. Queens' total population of 2.2 million is 49% immigrant (1.09 million), the largest immigrant concentration in NYC.[17] Because of district three's large immigrant population,

effective health communication is vital to help this vulnerable population, and the other members of the community.

Since District 3 is not made up solely of immigrants, a population-based intervention should be applied to focus on everyone impacted by diabetes. One of our objectives is to increase the number of people who live well with diabetes and successfully manage their disease to avoid or delay difficulties and improve quality of life. Stanford Patient Education Research Center created a Diabetes Self-Management workshop that is given 2½ hours once a week for six weeks in churches and community spaces, where groups of 12-16 type II diabetics attend. Two leaders, at least one being a diabetic, would facilitate the workshop.[18]

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We would add trained leaders from each of the immigrant populations within district three, and have education materials available in all the languages spoken within the district. The Diabetes Self-Management workshop uses some of the following topics: (1) Skills to handle the indications of diabetes, (2) Exercise for sustaining and improving endurance and strength, (3) Healthy eating, (4) Correct use of medication, and (5) Working efficiently with health care providers.[18] Participants will make weekly action plans, share experiences, and assist each other.[18] Health professionals and educators, both at Stanford and in the community, have reviewed all materials in the workshop and handle all medical inquiries; should any of the material conflict with teachings they received elsewhere, they are urged to follow their physician's orders and discuss those differences.[18] This process is effective because of member participation, where shared support and accomplishment build the participants' confidence in their ability to handle their health and retain active and satisfying lives.[18]

Increasing access to healthy foods can greatly reduce the burden of diabetes in Queens Community District 3. Providing farmers markets and bodegas that have fresh produce allows

residents to have much healthier food choices. Community district 3 has supermarkets that have specialty foods due to the dominant populations, which are Hispanic and Asian. In contrast, there is only one farmers market in Jackson Heights. There are far too many fast food outlets throughout this district, which are associated with an increased risk of obesity and a variety of other health issues.[19]

Healthy food incentive programs at farmers markets would greatly increase fresh fruit and vegetable consumption in low income neighborhoods. Health Bucks is a farmer's market incentive program that aims to reduce food insecurity among NYC residents by increasing access to fresh produce.[20] Health Bucks was established in 2005 by the NYC DOHMH.[20] The District Public Health Offices (DPHOs) hands out $2 coupons, also known as "Health Bucks" that can be used for purchasing locally grown fresh fruits and vegetables at farmers market in North and Central Brooklyn, East and Central Harlem, and the South Bronx (DPHO areas).[20] This program would be expanded to include Queens Community District 3. In addition, SNAP recipients have an added incentive: for every $5 in EBT purchases, an additional $2 Health Bucks coupon is provided.[20] Since high prices are a major reason why healthy food consumption is low, these incentive programs would increase affordability and lead to healthier purchases. Another program to aid the vast immigrant population in district 3 is Grow NYC, a nonprofit organization that sponsors more than 50 farmers market and trains immigrant farmers to combat the decline in farmers.[21] GrowNYC also provides job opportunities for immigrants and encourages them to make healthy food choices that could have a lasting influence on their own communities.

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Figures and Tables

Figure 1 - Image taken from Epiquery[9]

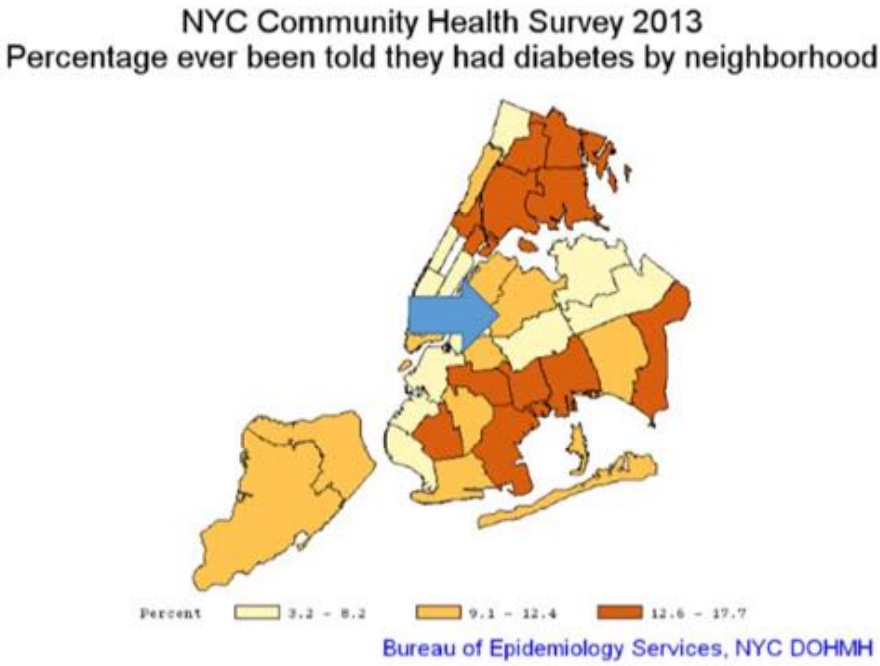
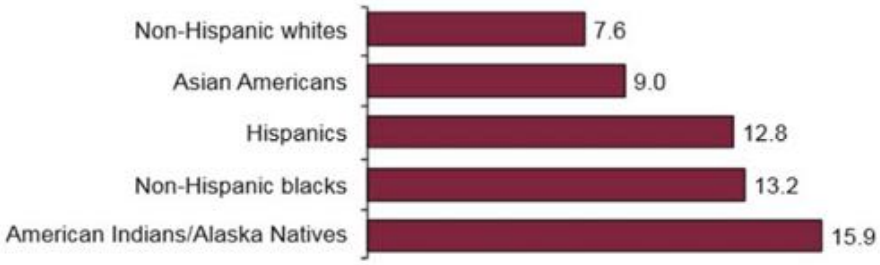


Table 1: Age-adjusted percentage of people 20 or older with diabetes, by race/ethnicity from 2010-2012

Age-adjusted* percentage of people aged 20 years or older with diagnosed diabetes, by race/ethnicity, United States, 2010–2012



*Based on the 2000 U.S. standard population.
Source: 2010–2012 National Health Interview Survey and 2012 Indian Health Service's National Patient Information Reporting System.

Table is from the National Diabetes Statistics Report, 2014[6]

GRADE: 14/15

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Staten Island Community District 1 Community Profile II

a. Primary Health Concerns in Community District 1

When one examines Staten Island's Community District 1 (SI CD1) health and epidemiologic profile, several major public health concerns are immediately made apparent. HIV is the ninth leading cause of death for SI CD1, with 24.1 newly diagnosed cases of HIV per year per 100,000 people, more than double the rate for Staten Island.[1] In spite of this, SI CD1 has only one sexually transmitted disease (STD) clinic to serve its approximately 175,000 residents' for prevention and screening needs.[2,3] Hospitalizations due to injuries resulting from assaults are high in SI CD1, over 40% higher than New York City's (NYC) rate.[1] Tobacco use is a tremendous problem in SI CD1, as it has the largest percentage (22%) of smokers in any community district in NYC.[1] SI CD1 also has a very high rate of mortality due to heart disease, with 277.4 deaths per 100,000 people, over 1.5 times the average rate for the U.S. as a whole.[1, 5] Finally, many SI CD1 residents struggle with chronic diseases related to nutrition and weight status, one of SI CD1's most serious public health problems.

Nutrition and weight status, one of the topics included in "Healthy People 2020," are the most pressing problems in SI CD1 for several reasons.[4] Thirty-three percent of SI CD1 residents are obese, the 10th highest prevalence amongst NYC's community districts. Obesity significantly increases one's risk of developing Type 2 diabetes, especially if weight is carried around one's middle, known as visceral adiposity.[6] Visceral adiposity also increases one's risk of hypertension, heart attack, and mortality.[7] Diabetes is the fourth leading cause of death in SI CD1 and 9% of adult residents in SI CD1 are diabetic.[1] Of great concern are SI CD1's avoidable hospitalizations due to diabetes, with 415 per 100,000 adult residents hospitalized for preventable diabetes-related problems, a rate more than 1.5 times that for Staten Island as a

whole and 33% higher than the average rate for NYC.[1] High rates of avoidable hospitalizations due to diabetes likely signifies many diabetics in SI CD1 have poorly controlled diabetes, which increases risk of serious complications such as diabetic retinopathy, diabetic nephropathy (the U.S.'s leading cause of kidney failure), diabetic neuropathy (which can require amputation of portions of the lower extremities), and cardiovascular disease.[8]

Commented [m1]: Good demonstration of why obesity & diabetes are primary health concerns in this district

Many of these chronic diseases are modifiable through changes in nutrition and weight status.[9] Research suggests that very low-fat, vegan, refined-sugar free, plant-based diets can prevent and reverse heart disease, and mediate a host of other chronic illnesses, such as diabetes and hypertension.[9-11] Lipids from fatty foods cause buildup of plaque in arterial walls: as the liver is unable to eliminate excess LDL cholesterol from the body, it circulates in the blood and adheres to the endothelial walls.[12] Excess sugar intake further exacerbates this process, as hyperinsulinemia prompts the liver to produce additional cholesterol.[12]

Weight status problems and the prevalence of many chronic diseases in SI CD1 may be closely tied with the lack of easy accessibility to nutritious food in SI CD1. Sources of fresh fruits and vegetables in SI CD1 are limited: a few large supermarkets and one farmer's market, the St. George Greenmarket, open Saturdays mornings, provide the fresh fruits and vegetables for approximately 175,000 SI CD1 residents.[6] There is a profusion of small local bodegas in SI CD1, which offer little to no fresh fruit and vegetable options and an abundance of processed and canned foods. Canned vegetables, often high in salt, are not a good food option for a population already grappling with hypertension, the 10th leading cause of death in SI CD1.[1] Approximately 14.5% of SI CD1 residents report eating no fruits or vegetables in a given day, and 32% report consuming one or more 12-ounce sugary drinks per day.[1, 12] Thus, though nutrition and weight status are not among SI CD1's leading causes of death, chronic diseases

and nutritional disorders that can be mediated or eliminated through nutritional changes are indeed one of the most pressing concerns that should be addressed in the district.

b. Review of Existing Literature

A nutritional disorder that exacerbates many chronic conditions, obesity refers to an excess of fat.[15] Obesity is usually assessed by the relationship between height and weight, which gives an estimate of body fat for clinical purposes. Body mass index (BMI) is the standard measure of overweight and obesity for people two years of age and older.[15] BMI is calculated by dividing the body weight (kilograms) by the height (meters) squared. Adults with a BMI between 25-30 are considered to be overweight and over 30 are considered to be obese.[15]

Type 2 diabetes mellitus (T2DM), the most common type of diabetes in adults, is characterized by high blood sugar, insulin resistance and impairment in insulin secretion by the pancreas.[16,17] One of the criteria for diagnosis of T2DM in patients that are asymptomatic is measuring by blood test hemoglobin A1C over 6.5%.[17] Common symptoms of hyperglycemia include increased urination, increased thirst, nighttime urination, blurred vision and, rarely, weight loss.[18] Obesity may cause insulin resistance and decrease the pancreas' sensitivity to glucose.[15,17] Causes of obesity include excess caloric intake and sedentary lifestyle lacking in proper exercise.[15] There are many ways of treating T2DM, which include lifestyle changes, medications, and patient education, which aim to decrease cardiovascular and other long-term complications.[20] One imperative treatment goal for diabetes is to control and lower glucose levels to mediate the risk of microvascular complications.[19]

For people with T2DM who are overweight or obese, decreasing caloric intake, maintaining medication regimens and increasing physical activity are key to achieving weight

loss, thus helping to improve control of blood sugar.[19] The methods by which insulin medication works include: stimulating insulin release from the pancreas, inhibiting reuptake of glucose in kidneys, reducing blood glucose levels, and increasing insulin sensitivity.[17,19] There are effective treatments for diabetes, but some patients may not tolerate medications well due to side effects, which may include severe hypoglycemia, increased risk of cardiovascular events such as heart failure, and weight gain, among others.[16,17]

Commented [m2]: Nice review of the literature

c. Review of Past Intervention Studies

Interventions that seek to address nutrition disorders, such as obesity, and chronic diseases, such as diabetes, can be difficult to organize and implement due to the interconnection of the root causes that result in poor nutrition and difficulties in treating their complications. Examining two interventions, a food co-op in East New York and a school-based program, Choice, Control & Change, we can better understand two, divergent tactics employed to combat obesity and promote healthy nutrition habits. These interventions illustrate two different types of interventions and focus our scope on interventions implemented within NYC, where the SI CD1 population resides.

The East New York Food Co-op aimed to provide economic opportunity to and increased wellness in Brooklyn Community District Five. A food cooperative is an autonomous membership organization that puts buying power in the hands of the community, enabling members to purchase discounted goods in bulk, direct from wholesalers and farmers, and cuts organizational overhead through requiring member labor.[25] In this style of market, fruits and vegetables offer the biggest savings and thus are naturally incentivized to members.[25] Funded by the NIH, starting in 2005, the East New

York co-op's goals included providing alternative food options, cooking and nutrition classes, as well as collaborating with Mount Sinai to provide free health screenings.[21]

Kimberly Morland studied the East New York Co-op over a three-year period analyzing the study population, which included community, health care partners and other major stakeholders involved with the co-op.[21] Morland concluded that the model for the co-op was not organized with the intention for success for a number of reasons. Members found the co-op space was beyond financial capacity and could not be maintained by the resources at hand.[21] This problem was compounded by the failure to consistently meet benchmark sale levels.[21] The co-op was unable to reach established goals due to lack of experience and instability of organizational leadership.[21] Although co-ops can be successfully sustained in some communities, they require organizational maintenance and structure. Organizational issues that can arise unfortunately surfaced as limitations to the intervention design in East New York, and although funding was hefty, the Co-op was closed in 2008.[21]

Commented [m3]: What were the limitations of her analysis? Was the community involved in the development of the co-op?

As compared to a macro-level, community intervention such as the East New York Food Co-op, more specific, field-based interventions are more heavily represented in the literature. For example, the Choice, Control, Change program aims to teach middle school students how biology and the world around them have an impact on nutrition and health outcomes.[22,23] Students in five schools learned through hands-on projects in the classroom, which provided a greater understanding of how food environment and choices had an impact on how they ate and felt throughout the day.[22] Studied over the 2006-2007 school year, students were evaluated with a pre- and post-test to see if they met the goals of increasing fruit and vegetable intake and physical activity.[22,23] This intervention did not explicitly involve the community around the schools, but used a "teacher- implementation" study

design, which may have resulted in limited student reception, as post-test outcomes improved when outside representatives initiated the program. Funding was provided by NIH as well as the National Center for Research Resources and was quoted by program organizers to be substantial and sufficient.[22,23] Overall, results supported the notion that this education-based intervention succeeded, as students in the post test consumed fewer sugary beverages and less fast food, while increasing both physical activity and healthy food consumption.[22,23]

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d. Proposed Program and Objectives

As mentioned above, due to the lack of retail options for fresh produce in SI CD1, current nutrition initiatives and food justice programs in Staten Island include citywide initiatives and community initiatives. Citywide initiatives include: mobile produce carts named Green Carts stationed in NYC food deserts, Green Markets, and City Harvest's Healthy Neighborhoods program, all of which are currently working to change food attitudes and behaviors in SI CD1. Concurrently, community-led interventions include initiatives like Community Health Action food pantry, a pantry that provides cooking and nutrition classes and Staten Island Partnership for Community Wellness and Staten Island Foundation's Take Care Staten Island.[14] Like the St. George Greenmarket, many programs of both types are limited in their scope and availability.[24] While other boroughs are allotted 100 to 175 Green Carts, NYC only allots 50 Green Cart permits to SI CD1, suggesting perhaps that low walkability of the area may significantly decrease likelihood of Green Cart utilization, a successful intervention in other boroughs.[25] City Harvest, a nonprofit that works in neighborhoods throughout NYC to combat food insecurity, has chosen the North Shore Neighborhood (SI CD1) as one of six "Healthy Neighborhoods" to provide emergency food assistance, educate residents on nutrition and enable community

organizations to provide healthy foods to residents.[26] Over the last year, City Harvest has hosted over 24 food markets, providing food for over 2,300 people every two weeks.[27] City Harvest depends on private donations for 99% of its budget.[27] Similarly, two salient points regarding the limitations of the Green Markets and Green Carts programs are their limited hours and dependence on city government funding, which may indicate impermanence.

As SI CD1 is a nutritious food desert, we propose that a food co-op intervention using a social ecological model target the social, economic, environmental and individual roots of nutrition disparity and address both the immediate and underlying issues at hand. Modeling our intervention after the Healthy New York campaign, which outlines objectives for healthy nutrition initiatives at the community intervention level, proposed program objectives include: increasing retail availability of healthy foods, adopting policies to reduce overconsumption of sugary drinks, implementing practices to increase access to affordable healthy foods for individuals, and investing in evidence-based community programs for improved nutrition.[28] Starting at the individual level, while working at the co-op members may gain new skills, social capital, and confidence, which could lead to paid employment and foster an environment of inclusion and community.[29] Interacting with community members equally interested in maintaining their own and the community's health and wellbeing may decrease social isolation.[26,28] Policies may take decades to change, and NYC has had particular difficulty in implementing policies to change the consumption of sugary drinks, however, the co-operative could embed this objective into its purchasing decisions with member support.[27] Should the co-op members choose to do so, a partnership with Island Charter, a charter bus company, could provide shuttle transport to the co-op from nursing homes, adult homes and public housing that would increase co-op access to individuals with mobility challenges, the elderly and residents of

public housing located in SI CD1.[30,31] By strategically locating the co-op at the New Stapleton Waterfront, we would already increase the proximity of affordable healthy foods to individuals living in the neighborhood's public housing.

The literature suggests that a food cooperative will need a wealth of support from primary, secondary and potential building blocks in order to succeed.[21] Partnering with existing healthy restaurants and community programs, our food co-op could bolster healthy options throughout SI CD1 by offering healthy takeout prepared foods, increasing partners' consumer base and healthy option awareness. Start-up grants from community organizations like Staten Island Foundation and national corporations like Community Cooperative Fund as well as consultancies from Staten Island Small Business Development Center would help the co-op to be well-organized and maintained in order to avoid the pitfalls that befell the East New York co-op. Due to prevalent health problems and inadequate healthy options, SI CD1 requires a nutrition intervention that can provide longstanding support. A food cooperative would not only empower the community to drive the market and the food environment in a healthy direction, but also would amplify the current food culture revolution happening throughout NYC as a whole.

Commented [m5]: Need two specific and measurable objectives

Commented [m6]: Nice conclusion

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GRADE: 14.5/15

Birth Tourism and Caribbean Women

Professor Meredith Manze
COMHE 770.85
Final Paper
7/8/2012

Abstract: The paper presents the results of a qualitative study based on Caribbean women's (who come to the United States solely for giving birth) childbirth experience in the U.S. and their native country. The paper contributes to the understanding of birth tourism by shedding light on the reasons for women coming to the U.S. to give birth and the factors that enabled to make that decision.

INTRODUCTION

In the wake of globalization, many people now have the opportunity to travel to many previously unreachable foreign destinations. As such, there is a growing phenomenon known as medical tourism, which is understood as traveling abroad with the intention of obtaining non-emergency medical services, but little is known about its scope.[12-14] Likewise, so is "birth tourism", used interchangeable with "maternity tourism", which is also becoming a growing industry within medical tourism.[8,11,13] In recent years, there has been an increase in advertised packages for doctors, insurance, and postpartum care by businesses located in China, Mexico, and South Korea.[1,6,7] Birth tourism clinics have appeared throughout the U.S., including states, such as New York, where a Turkish-owned hotel on the Upper East Side of New York City has advertised month-long "baby stays" that come with a stroller.[1,2] These businesses have made a lucrative practice of arranging birthing accommodations in the U.S. for wealthy pregnant women (often documented as Asians -- Chinese and Koreans, respectively) from overseas who are entering the country for the sole purpose of attaining U.S. citizenship for their children.[1,4,6]

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As such, birth tourism is commonly perceived and popularly depicted as an economic issue, both at the system and individual levels, yet the decision to engage in such tourism is more complex.[8] Some of these women decide that travelling is in their best interest, as they prefer to be closer to family for the birth. Other women may decide that they do not mind travelling in order to give birth with a particular doctor or at a particular facility. Still, others choose to travel abroad to give birth due to personal preference or for private reasons beyond obtainment of an American citizenship for their baby, such as seeking a safer birthing experience due to poor healthcare in their native country. However, there is no data documenting these reasons. Moreover, the focus has been largely on Asian and Mexican pregnant women, omitting women

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from other backgrounds, such as the Caribbean, in this discourse. Furthermore, there is lack of data on traditional birth tourism (i.e., non-advertised packaged), but the reliance of existing social networks –-family and friends and the use of regular medical facilities (e.g., hospitals and clinics), often public. Therefore, the aim of this study is to better understand the scope of birth tourism by examining the experiences of Caribbean women. Thus, the research question is: What are Caribbean primiparous or multiparous women's (who come to the United States solely for giving birth) perceptions are prior to coming to the U.S., their reasons, and their experiences of childbirth in the U.S., compared to their native country?

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METHODS

Study Participants

Eligibility

To be eligible to participate in the study, participants were required to be a cis female, born and currently living in the Caribbean region. Participants had to have given birth at least once in their native country. In addition, participants had to have given birth at least once in the United States of America within the past 10 years and had to have come here solely for giving birth. All participants' births (between native country and the U.S.) had to be less than 10 years apart.

Recruitment

For the study, two (2) women from the Caribbean region (Trinidad and Tobago and Grenada, respectively) were recruited to participate in an interview. All participants were recruited using the snowball approach, with my personal social networks of family and friends as the initial point of entry. Recruitment consisted of family and friends providing potential participants with brief information about my educational background and the purpose of my

research (i.e., needed to complete a summer class). If any eligible woman was interested in participating, either she was given my contact information or I was given hers. The snowball strategy was adopted to make recruitment easier, given the time constraint of the study, as well as the nature of the study. Although, I had told 5 personal contacts, I do not know how many potential participants were informed. I received immediate interest by one potential participant and shortly another response through a personal contact. However, shortly before the interview, the latter participant could not conduct the interview for unknown reasons. A third person was contacted, who agreed to an interview.

Data collection and analysis

Data Collection

Semi-structured, in-depth interviews based on a topic guide, which include a brief survey, were used to enable a detailed exploration of women's' views and experiences using a flexible and responsive approach. The in-depth interviews were conducted over the internet using Skype -- a freemium voice-over-IP service and instant messaging client software, roughly between 30 and 35 minutes, over the weekend of June 21 – 22, 2014. All interviews were recorded with the permission of the women being interviewed using the Smart Voice Recorder mobile app. After the interviews, the recordings were transcribed into computer files using Microsoft Words. I assured the participants that they would not be identifiable in any subsequent report by letting them know prior to the interview that all information shared and expressed during the interview would be kept confidential. I also used pseudonyms in the transcripts to protect the confidentiality of parents and children. Once the final research report was written, the recordings from the interviews were permanently deleted.

Data Analysis

For the analysis, the interview transcripts were thoroughly read and coded in the style of a grounded theory approach to data analysis, which helps identify patterns within the data (i.e., interview transcripts). The interview transcripts were indexed and mapped based on recurring themes. Twenty-one codes were generated and five category headings were generated from the data and under these all of the data were accounted for. Four independent researchers (i.e., 1 professor and 3 classmates) were asked to verify the seeming accuracy of the category system by providing critical and analytic feedback, and after reviewing their feedback, modifications were made to the categories. Table 1. presents the demographic characteristics of participants and their children.

TABLE 1. Demographic of participants

Participant's ID	**0023**	**0069**
Age	37	35
Nationality	Trinidad and Tobago	Trinidad and Tobago
Number of children	3	2
Gender/Age of children	1st birth: Girl and Boy (twins)/13 2nd birth: Girl/8	1st birth: Girl/15 2nd birth: Boy/ 7
Type of labor	1st birth: induced 2nd birth: induced	1st Birth: spontaneous 2nd birth: induced
Type of Delivery	1st birth: vaginal 2nd birth: vaginal	1st birth: vaginal 2nd birth: vaginal

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Commented [MD6]: Would help to add the country of birth for each child

RESULTS

The findings are presented according to the key themes and subthemes: (i) the influence of a planned vs. unplanned pregnancy in the decision to travel (ii) The role of family in birth tourism (iii) dualities of native country U.S. healthcare system (iv) cultural pain management norms and (v) birthing expectations of pregnant women. Throughout this section, participant's id number is used to identify the quote's source.

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i. The influence of a planned vs. unplanned pregnancy in the decision to travel

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The study participants said that their decision to travel abroad was influence by whether their pregnancy was unplanned or planned. The participants said that the reason for not giving birth in the U.S. with their first pregnancy was due to the pregnancy being unplanned. Thus, they were unable to make adequate travel and birthing arrangements in a timely fashion. Moreover, participants mentioned that when they had considered traveling abroad, their bellies would have also been too visible, which could have been grounds for an immigration officer to prevent them from entering the U.S. Participant 0069 states, "…my stomach was too big at seven months to travel to the States. That's why my daughter was born in T n T [Trinidad and Tobago]." As a result, participants chose to give birth in their native country. However, with their second pregnancy, participants mentioned that it was planned, thus they were able to travel to give birth before their stomachs became visible. On average, the participants travelled when they at five months pregnant.

ii. The role of family in birth tourism

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When asked about other reasons that abetted their decision to travel and what informational resources were consulted, participants mentioned that they relied on their family members, living abroad in the U.S. Participants said that it was family members; primarily

women (e.g., mother, aunt, cousin) who provided them with the information, such as the procedures and protocols for obtaining the government funded maternity insurance coverage. In addition, family members provided them with shelter during their stay in the U.S.

iii. Dualities of native country and U.S. healthcare system

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Although the study participants' native country of Trinidad and Tobago has socialized medicine (i.e., free or nominal cost of healthcare), which provides free maternal services, ranging from prenatal care to services incurred during labor and delivery, participants mentioned that they were dissatisfied with certain aspects of the healthcare system. Two common areas that they expressed dissatisfaction with are the lack of advanced medical technology and the unprofessionalism of healthcare providers, especially nurses, whom "seem like they never knew how to fully comprehend their reasons for being nurse" and "needed a lot of people relations training and skills workshop". The participants blamed the lack of advanced medical technology, but particularly the lack of professionalism for the high rates of infant mortality. They also mentioned that the high infant mortality rate in their native country also bolstered their decision to give birth in the United States with their second pregnancy.

On the contrary, participants lauded the U.S. healthcare system in these areas. The participants were highly impressed by the level of care that they received during their pregnancy by healthcare providers, particularly nurses, whose level of professional competence was "exceptionally excellent". For instance, participants shared that the constant availability, presence, and support of nurses at the time of their hospitalization made their birthing experience much better than their native country, despite their respective pregnancy complications and the admittance of their baby in the intensive care unit. They emphasized that the combination of professionalism and the use of advanced medical technology they encountered in the U.S. played

a significant role in their baby's health outcome following their subsequent care after birth in the intensive care unit, which exceeded more than two days for each participant.

When participant 0023 was asked to recount her birthing experiences, she states,

> "…During the entire time [while giving birth for my1st pregnancy], I was screaming. I was in a lot of pain. When baby #2 finally was delivered, she was not breathing. It was just terrible and heart breaking. But with my last pregnancy [in the U.S.], it went really well. It was completely different than my first with the twins."

Participant 0023 said that despite being hospitalized for an entire week prior to giving birth and receiving a potentially lethal medication that could have harmed her unborn child as a means to help induce her labor, the constant monitoring and professionalism by doctors and nurses helped mitigate her concerns.

Although, study participants had different birthing experiences in their native country, they agreed that their pregnancy and birthing experience was exceptionally different in the U.S. from their native country due to advanced medical technology and the high-level professionalism of healthcare workers**.**

iv. Cultural Pain Management Norms

When participants were asked about labor management and coping techniques, participants shared that they bared the pain for both pregnancies, as it was a "cultural norm". The participants mentioned that with their first pregnancy in their native country, epidural was not a customary procedure since it was relatively new to the region in the late 90s and early 00s. The participants also mentioned that pregnant women, as well as doctors, mostly in public hospitals did not grant epidurals due to the risks involved, such as the fear of a woman losing her ability to walk; however, participants stated that they were given other forms of pain relief medications

then. However, even with the perceived safety of epidural during their second pregnancy in the mid-00s in the U.S., the study participants still opted from being given an epidural. As participant 0069 states, "Yes, it was a personal decision [not to have an epidural]. It's customary in my culture for women to give birth without getting an epidural. I did not see the need to have an epidural with my son, given that I had delivered my daughter without one." Nonetheless, participants received other forms of pain relief medications. Moreover, they also discussed that the support of attending nurse's helped ease their pains while giving birth.

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v. Expecting a Healthy Baby

Because of their adverse birth outcomes with their first pregnancy, study participants conveyed being equally as stress with their second pregnancy, albeit being in the U.S. They expressed fears of unborn child dying, being injured during birth, or being born with a health condition. As a result, their only birthing expectation was to have a birth outcome that resulted in the delivery of a "healthy and normal baby". For instance, during their first pregnancy, participant 0069's baby was diagnosed with a tetralogy of fallot, a rare congenital heart defect, whereas, one of participant 0023's twin's foot was damaged during delivery due to the baby being in a transverse presentation (i.e., breech). Therefore, the study participants only wished for a viable and healthy child with their second pregnancy. As 0023 states, "…my daughter is now a happy and spontaneous 8 year old that is very much vibrant." Further supporting that the study participants only hope was for a normal child.

Commented [MD12]: Nice description of findings

DISSCUSSION

The results from this study suggest that there are various reasons for women coming to the United States to give birth besides the premise that they solely want an American child. The findings reveal that women are opting to travel abroad in hope for a safer birth outcome due to

their native country's poor quality of healthcare. However, the decision to make that choice involves many factors, such as having a planned pregnancy and the resources that will enable them to travel (e.g., money and a passport). Additionally, the women have to make sure that they have secured a place to stay before they arrive in the U.S.; therefore, it is critical that they have an existing and reliable social network of family and friends. Furthermore, they also have to be knowledgeable on how to obtain maternity health coverage and informed on how to maneuver the healthcare system once they arrive in the U.S.

Most importantly, the findings show that the professionalism of healthcare providers is critical in a woman's pregnancy and subsequent experience with labor and delivery. The study shows that these contacts determine the woman's birth outcomes to a great degree. It was most certainly apparent that birthing support by healthcare providers, specifically nurses was essential in calming and empowering the women while giving birth and overall determines their childbirth experiences.

Consequently, the implications of the findings suggest that countries within the Caribbean region need to improve their healthcare system, particularly in the quality of their maternity services, starting from prenatal care to labor management and delivery care. More so, that the focus should be specifically on training their healthcare workers to be more cognizant of the needs of pregnant women and the manner in which they interact with them, given their vulnerable state. In addition, these countries within the Caribbean region should take the necessary measures to ensure that healthcare professionals are knowledgeable and skilled to carry out the duties involved with maternal and child health care services, such as how to handle breech births that would not result in the harming of mother, baby, or both. Moreover, the

findings suggest that the healthcare system needs modernizing through the incorporation and use of the latest medical technologies to ensure a safe birth or post-delivery care.

In interpreting the findings of this study, it is important to acknowledge its limitations. The sample size was small and derived from women who had not given birth within the past 5 years and thus their birthing experience may not be reflective of recent and current changes in maternal services and practices (whether good or bad) in their native country and the U.S. In addition, the participants were also from the same country – Trinidad and Tobago, therefore, the study may not be a very accurate representation of women from the Caribbean region. As a result, the size and homogeneity of the sample may have limited the generalizability of the study's findings. Another limitation is that the interview guide's questions and probes, in retrospect, may not have been refined enough to illicit better responses from the participants.

Nonetheless, the findings provide information that has been lacking in the literature in regards to the inclusion of other women within the discourse of birth tourism in the U.S. Moreover, the study provides detailed information on the experiences of pregnant women both in their native country and in the U.S., in similarities and differences, as well as the nuances of each participant's pregnancies. Furthermore, the findings may help future studies expound on the different experiences of women by examining birth tourism more closely among women of other regions of the world. Future research may consider examining the phenomenon by studying traditional birth tourism, juxtapose to the burgeoning businesses that are offering all-inclusive packaged deals for wealthier women. Additionally, future studies may reveal if the findings in this study among this particular demographic of women is still prevalent.

Commented [MD13]: Nice synthesis of findings, limitations and recommendations for practice

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Well-written, interesting and quality analysis. Excellent.

GRADE: 20/20

The PIMCO Foundation
650 Newport Center Dr.
Newport Beach, CA
92660-6398

Dear PIMCO Foundation,

Catholic Charities of Brooklyn and Queens (CCBQ) is extremely excited by the possibility of PIMCO supporting the development of a program that not only will educate the Coney Island community on healthy eating but also increase food security by providing them practical knowledge that will help residents obtain employment. **We request consideration of an Engage grant of $75,000 over 1 year to support Employment through Nutrition at the Our Lady of Solace food pantry for FY2016.** Please see the enclosed proposal for information on what the program entails and why it is so vital to the Coney Island community.

Within the past three years, rates of poverty, unemployment, and obesity have increased and resources for help have decreased on the island. It is our mission to support members of the community by empowering and educating them. Employment through Nutrition will address food security while providing skills to increase employment as peer nutrition educators.

We are confident that a grant from PIMCO will allow this program to live up to its full potential and benefit hundreds of lives. We hope by the end of this proposal the dire need for this program will be evident and how it will not only help the program participants but the entire community. We look forward to hearing from you in the future and would love for you to help us take on this venture. Thank you for the consideration of pursuing this grant with CCBQ.

Sincerely,

Catholic Charities



EMPLOYMENT THROUGH NUTRITION

GRANT PROPOSAL

May 21st, 2015

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EXECUTIVE SUMMARY

Coney Island, located in Brooklyn, New York, is comprised of a large hard working immigrant population that has access to minimal resources with more than half of the food pantries unable to meet the demands of the people. Poverty is a major issue for residents and has been caused by lack of employment resulting in food insecurity and obesity. The rate of food insecurity is higher than the national average and more than half of the residents are overweight or obese, resulting in high rates of chronic diet-related disease among residents.

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In hopes of reducing diet related diseases, Lady of Solace food pantry –an extension of Catholic Charities- is creating a program, **Employment through Nutrition** that addresses the root causes of food-related diseases. The program will both educate members of the community on nutrition and provide them with job skills to make them more marketable within the workforce.

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Employment through Nutrition will be a 6-month program made up of 24 culturally competent weekly sessions that are 2 hours each. Half of the sessions will focus on nutrition, and half will focus on job readiness skills. Their will be 3 variations of the class; English, Mandarin and Russian, with 30 participants each. At the end, 90 participants will have been directly affected, but countless community members will benefit as knowledge spreads and increased employment creates economic growth.

To allow Employment through Nutrition to help the Coney Island community, we are requesting $75,000. This money will help us hire qualified employees and provide participants with quality resources. Catholic Charities, established in 1899, has multiple sources of funding and has helped 17,488 individuals within the past year through its countless outreach programs.

Employment through Nutrition looks forward to enhance Catholic Charities, Lady of Solace food pantry, and the Coney Island community.

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STATEMENT OF NEED

The dual issue of food insecurity and obesity is a growing public health concern in the United States.[1,2] It has been well established in the literature that socioeconomic status contributes to disparities in food insecurity and subsequent diet-related diseases.[2,3] Coney Island, a vibrant and diverse community located on southwest peninsula of Brooklyn, is a microcosm of such issues.

Coney Island has a significant senior population and a large immigrant community. Eighteen percent of the neighborhood's population is 65 years and older and almost half of residents are foreign born (49%).[4,5] For many Coney Island residents, English is not their primary language. At home, around 36% of residents speak Russian and 14% speak Asian languages including Mandarin and Urdu.[4] Poverty is also a salient issue for Coney Island residents. In 2012, 21% of residents lived in poverty and 9% of the labor force was unemployed. In Coney Island, the median household income is approximately $32,000, which is $12,000 less than the median of Brooklyn as a whole. Housing is also a growing concern, with increases in the median gross rent and half of all renters paying more than thirty percent of their total income on rent.[3]

Poverty is a key determinant of food insecurity and obesity, as food quality and quantity are compromised when household food budgets fall too short to meet adequate nutrition needs.[3] In many neighborhoods, including Coney Island, unhealthy, high-energy dense foods are aggressively marketed, highly accessible, and inexpensive.[6] Subsequently, Coney Island residents also experience numerous health challenges. Rates of food insecurity in Coney Island

are at 20%, compared to 14% nationwide.[7,8] Over half of Coney Island residents are overweight (28%) or obese (32%). In addition, 9% of residents are diabetic and one in three have hypertension.[9] A Needs Assessment conducted by Coney Island Hospital identified diabetes, heart disease and obesity as priority needs.[10]

With high rates of unemployment and rising costs of living, more residents are finding themselves unable to purchase foods that meet the adequate nutrition requirements necessary to prevent these key diet-related diseases. Food Assistance programs are also struggling to meet the growing demand. 91% of food pantries and soup kitchens in Brooklyn reported a growing demand for services since 2010, and more than half indicated not having enough food and resources to meet the increasing needs of residents.[11] Given the increase in demand for safety-net food providers, it is critical that food assistance programs develop services to address the root causes of food insecurity and diet-related disease beyond food access. Previous studies have suggested that food assistance programs may be well positioned to integrate nutrition and financial education and support into existing services in order to meet the complex needs of communities.[12, 13]

Catholic Charities is a community-based organization that currently runs 20 food pantries in high-need areas of Brooklyn and Queens. Last year, the food assistance program helped distribute more than 1 million meals to over 115,000 people.[14] Taking into consideration the community's needs and existing resources, food pantries in Brooklyn can be leveraged to implement a program that addresses the interrelated issues of obesity, food insecurity, and unemployment.

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PROJECT DESCRIPTION

Project Goals/Objectives. Understanding Coney Island's priority needs areas, we propose a skills-based program that will integrate nutrition knowledge, cooking skills and job readiness in order to address the root causes of food insecurity. Program goals and objectives are dependent on program implementation and participant enrollment in the 6-month program. We will implement a total of 24 culturally competent program weekly sessions (2 hours each) tailored to the Russian and Chinese populations in Coney Island. We will conduct 3 versions of the program in English, Mandarin, and Russian and aim to recruit 30 participants in each language cohort; 90 participants overall. In order for participants to obtain optimal benefits from the program activities, they must attend 75% (18/24) of the total weekly sessions. It is anticipated that 24/30 participants will meet the minimum attendance requirement for graduation.

Goal 1: Increase nutrition knowledge and healthy eating behaviors in Coney Island.

- Objective 1: At the end of the 6-month program, 80% of participants will have increased knowledge about adequate nutrition, healthy cooking skills, and how food choices relate to diet-related diseases.
- Objective 2: At the end of the 6-month program, 50% of participants will meet the recommended 2010 dietary guidelines for fruit and vegetable intake; 5 servings of vegetables per day and 3 servings of fruit per day, and continue to meet it for at least one year.
- Objective 3: At the end of the 6-month program, 60% of participants will have increased knowledge of the 2010 dietary guidelines recommendations for physical activity; 30 minutes per day.

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Goal 2: Increase food security on Coney Island through the use of community and state resources

- Objective 1: At the end of the 6-month program, 80% of participants who qualify for Supplemental Nutrition Assistance Program (SNAP) will have applied or renewed their application to receive maximum benefits.
- Objective 2: At the end of the 6-month program, 80% of participants will have planed an individualized, 1 week, budget friendly meal plan.

Goal 3: Increase participants' job readiness skills and decrease unemployment rates on Coney Island

- Objective 1: At the end of the 6-month program, 75% of participants will be aware of nutrition-related employment opportunities within Coney Island and the surrounding areas accessible by public transportation.
- Objective 2: At the end of the 6-month program, 75% of participants will gain skills to aid them in obtaining a job including interview skills, resume building skills, and guidelines for professional attire.
- Objective 3: At the end of the 6-month program, 80% of participants will have met program requirements for graduation and receive a certificate of completion for employment opportunities in the food and nutrition field.
- Objective 4: Within one year of completion of the program, 15% of participants will be employed.

Commented [m8]: Are there enough resources for those who do apply? The need statement referenced many food banks feeling under resourced

Commented [m9]: Consider expanding the scope of potential employment

The goals of the proposed program are well aligned with PIMCO's indicated priority areas for 2015, which aim to fund programs that address issues of food insecurity and enhance workforce development opportunities in underserved communities.

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Methods. Catholic Charities will implement Employment through Nutrition over a one-year period and run three language-specific versions of the program. Months 1-2 will focus on hiring, training and recruitment. The program for English speakers will launch in month 3, followed by the Mandarin cohort in month 4 and the Russian cohort in month 5. Months 11 & 12 will focus on evaluation. Each language cohort will receive a similar 6-month program with some culturally appropriate variations. Participants will attend 24 two-hour sessions following the food pantry's Monday hours based on language cohort. Sessions will rotate between nutrition education and job readiness skills. All classes will end with an interactive cooking component. Employment through Nutrition is open to all food pantry clients over the age of 16. To address immediate food insecurity needs, staff will help qualifying participants apply for or renew applications to receive maximum SNAP benefits.

The nutrition curriculum will cover healthy diet and physical activity guidelines and address links between diet and chronic disease prevention and management. In addition, participants will learn about food safety and develop meal plans and food budgets. In the cooking skills segment, participants will prepare a healthy recipe using foods available at the food pantry. This component will often focus on how to modify culturally relevant recipes to increase nutritional value. All recipes will be budget friendly and easy to prepare.

The job readiness skills curriculum will cover interview strategies and resume and cover letter writing. Participants will also learn to lead and facilitate culturally competent nutrition

education and cooking skills programs. Participants who successfully complete the program will receive a certification of achievement. The certificate demonstrates participants' mastery of this skill set and can be an additional credential for job applications. Upon completion, the program will connect participants to other community-based nutrition organizations for potential employment opportunities as nutrition peer educators or advocates.

Evaluation. Evaluation is the primary mechanism to determine the success of the program. The stated goals and objectives are dependent on participant enrollment and engagement in the 6-month program. In order for participants to obtain optimal program benefits, they must attend 75% (18/24) of the total weekly sessions. We will track attendance in order to determine the number of participants that meet the minimum dosage (18/24 sessions) but also to engage participants who may be in danger or not graduating due to excessive absence. Attendance data will help the program determine whether participant enrollment and engagement targets were met. The following performance metrics will be assessed among those who meet the minimum dosage requirement.

A major goal of the program is to increase participants' healthy eating knowledge and behaviors. In order to assess changes in knowledge and behavior we will collect pre-post surveys. The surveys will assess baseline knowledge of adequate nutrition, healthy cooking skills, diet-related diseases, and dietary guidelines for fruit and vegetable in-take and physical activity. Changes in self-reported fruit and vegetable intake will also be assessed using the pre-post survey.

The second goal is to increase food security through the use of community and state resources. Program staff will be required to document the total number of eligible participants who enrolled in SNAP or who renewed their benefits during the program period. Another

program goal is to ensure that all participants develop a weekly food budget. Participants will be asked to submit a copy of their food budgets in order to discuss with staff and to document completion rates.

Finally, the program aims to increase job readiness skills and employment rates among participants. Changes in these areas will also be determined using a pre-post survey. The survey will allow us to determine baseline rates of employment and knowledge regarding key job skills such as interviews, resumes, and guidelines regarding professional attire. This data will also allow staff to tailor program sessions based on needs or knowledge gaps that emerge from the survey. The program will track the number of graduates who are linked to other community-based organizations for employment opportunities immediately upon graduation. The program will also have a system in place to follow-up with program alumni and document the number of participants employed in the food or nutrition field one-year after the program.

The above quantitative measures will allow us to clearly determine whether program activities successfully achieved the stated outcomes. The program will also collect qualitative data in order to ensure that the program is meeting participants' needs. The program will administer satisfaction surveys at the mid-way and end point of the program. Program staff will also conduct exit-interviews in order to discuss individual progress and to connect participants to potential employment opportunities. Participant feedback on the program will also aid in quality improvement efforts both during and after the program.

Commented [m11]: Nice evaluation plan that matches program objectives

Sustainability. With diverse funding streams, Catholic Charities is well prepared for sustainable growth and continual support of successful programs. In 2012, Catholic Charities received funding through foundation grants and contributions from corporations and the Brooklyn and Queens Dioceses.[15] The organization also received revenue from rental properties,

investments, and service fees from the government and third party reimbursement.[15] Catholic Charities is committed to transparency and efficiency; 91 cents of every dollar donated goes directly to programs.[16]

Commented [m12]: This is ok but doesn't leave me encouraged that this program can be easily sustained once the money runs out.

ORGANIZATION INFORMATION

Since 1899, Catholic Charities in the Diocese of Brooklyn and Queens, guided by the principles of the Catholic Social Teaching, has been serving and empowering Brooklyn and Queens' diverse communities. Catholic Charities Brooklyn and Queens (CCBQ) mission is to "translate[s] the Gospel of Jesus Christ into action by affirming the dignity and value of every person, especially the most vulnerable members of our diverse society. Catholic Charities develops effective responses to human need and joins with all people of good will in advocating for a social order which promotes justice and embraces human development."[17]

Initially formed in order to outreach and care for the orphan children in its communities, as more needs emerged the organization expanded its outreach and services. In order to provide additional and more diverse services, the organization widened its areas of programming, becoming one of the leading organizations in the nation. Today, CCBQ offers more than 160 programs and services, reaching all segments of Brooklyn and Queens' communities: adults, seniors, children and youth, as well as the disabled and mentally ill. The organizations' programs include: Parish and Community Outreach, Behavioral Health Services, Early Childhood Services, Family Services, Older Adult Services, Housing Services, Developmental Disability Services, and Affiliated Agencies.[17]

During this past year, CCBQ Parish and Community Outreach services program provided services to 17,488 individuals through its two community centers in Brooklyn and Queens, and its 16 satellite sites located in areas of high need. The two community centers, one in Brooklyn

and one in Queens, provide on-site emergency food assistance, financial assistance, continuing education opportunities, such as GED, ESL and computer classes, guidance for employment, immigration and bereavement services, as well as referrals and access to other needed services. In addition, this past year, CCBQ Parish and Community Outreach services program awarded emergency funds to 433 families who received a total of $115,437 to prevent utility shut offs, 155 individuals received $36,600 for assistance with energy and heating utility bills, and 380 families received a total of $221, 315 in rent assistance. Through its network of 20 Food Pantries located in 17 perishes, 1,071,072 meals were distributed to 119,000 community members, and health bucks to purchase produce at nearby farmer's markets were given to individuals in order to promote healthy eating. [18]

CCBQ is comprised of 14 senior staff members, 47 board members and junior board members, young professional volunteers, who assist with CCBQ projects and initiatives in Brooklyn and Queens' communities. This past year, 130 volunteers provided assistance in many different CCBQ Parish and Community Outreach services projects. Richard Slizeski, who has been working with CCBQ for more than a decade, directs parish and Community Outreach and Services program. Mr. Slizeski received his Bachelor of Arts degree in Journalism and Spanish from the University of Wyoming, holds a Master of Divinity degree from the Washington Theological Union, a Master of Social Work from Fordham University, and a New York State Master of Social Work License. Prior to joining CCBQ, Mr. Slizenski gained broad experience at several social service agencies and pastoral services as well.[17]

CCBQ Parish and Community Outreach service program is also able to provide its extensive vast services as a result of its strong established collaborations with fellow strategic partnering organizations. Some of these include: Catholic Migration Services, Fidelis Care of

NY, St. John's University, St. Joseph's College, DeSales Media Group, Inc, LifeWay Network Inc, Human Resource Administration, Cornell University Cooperative Extension, NYC Department of Education, ConEd and National Grid, Visiting Nurse Services, etc.[18]

Commented [m13]: Nice description of org.

CONCLUSION

Food insecurity caused by poverty can lead to many co-morbidities including obesity, hypertension and diabetes. On Coney Island, the median income is shockingly less than the median of Brooklyn as a whole. Many of the residents are unemployed, inhibiting them from having access to healthy and nutritious meals.

Employment through Nutrition's undertaking is to empower and educate community members so they can take full advantage of employment opportunities and lead healthy lives. Within the first 6 months of the program, 90 participants will be directly affected and a countless number of people will have benefited. As participants learn about accessible, healthy eating they will teach their friends and family members. Similarly, as they become employed they will bring money to the local economy, which will benefit thousands. We strongly look forward to PIMCO helping us change lives and bring vitality to a much-needed community.

BUDGET SPREADSHEET

Budget, Employment through Nutrition
Catholic Charities Brooklyn and Queens

Personnel Costs	**Salary**	**% Effort**	**Total**
Project Coordinator	$50,000	50%	$25,000
Parish and Community Outreach Director	$86,000	10%	$8,600
	Rate	**Hours**	**Total**
English-speaking Nutrition Educator	$26/hr	104	$2,704
Russian-speaking Nutrition Educator	$26/hr	104	$2,704
Mandarin-speaking Nutrition Educator	$26/hr	104	$2,704
Subtotal Personnel Costs			$41,712
Fringe Benefits at 24%			$10,010
Total Personnel Costs			$51,722
Other Direct Costs			
Printing and duplication			$450
General office supplies			$200
Cooking equipment			$1,800
Food			$6,480
Educational materials			$810
Rent/utilities			In kind
Subtotal Other Direct Costs			$9,740
Total Direct Costs (Personnel and Other Direct Costs)			$61,462
Indirect Costs			
22% of total direct costs ($61,462)			$13,521
Total			**$74,983**

Commented [m14]: Fringe not normally given to hourly employees (educators)

Commented [m15]: This is a lot of money to serve <100 people

BUDGET JUSTIFICATION

Personnel Costs:

Project Coordinator- An existing staff member in the Parish and Community Outreach Division of Catholic Charities will spend half her time coordinating Employment through Nutrition and the remaining half on existing programs. The Project Coordinator will be responsible for program logistics and coordination between the host site, the nutrition educators and Catholic Charities. The Project Coordinator will train the nutrition educators on the program curriculum, assist in participant recruitment, ensure that the nutrition educators have the necessary supplies each week, and lead the project evaluation.

Parish and Community Outreach Director- The Parish and Community Outreach Director, NAME REDACTED, is responsible for all programs within Parish and Community Outreach. He will spend 10% of his time on Employment through Nutrition. NAME REDACTED will supervise the Project Coordinator and Nutrition Educators and ensure that the project aligns with the overall mission and goals of the Parish and Community Outreach division.

Nutrition Educators- Three part-time Nutrition Educators will be hired to facilitate Employment through Nutrition on a weekly basis. Nutrition Educators will be responsible for set-up, leading class activities and cooking demonstrations, and clean up. Nutrition Educators' time is estimated at four hours a week for 14 weeks (12 weeks of facilitation, plus a week of training and a week for project wrap-up).

Commented [m16]: I thought the program was 6 months (24 weeks)?

4 hours X 14 weeks = 56 hours per educator but the budget says 104 hours per educator

Fringe Benefits- Fringe Benefits for all five personnel were calculated at a rate of 22 percent. Benefits include payroll taxes and medical benefits.

Other Direct Costs:

Printing and duplication and general office supplies- Printing and duplication costs will cover printing and copying all program fliers, registration materials, class session sign-in sheets and handouts, and evaluation materials throughout the program. Printing costs will include certificates of achievements for participants who graduate from the program. General office supplies will include flip charts, pens, pencils, markers folders, and other general office supplies for the Nutrition Educators and program participants to use throughout the program.

Cooking equipment- For the cooking skills component, the program will purchase enough small kitchen appliances for two language cohort classes to run simultaneously. The program will purchase hot plates (20 double burners hot plates at $35 each), blenders (20 blenders at $25 each) and electric griddles (20 at $30 each) as well as smaller cooking equipment including measuring cups, utensils, knives, pots, mixing bowls, cutting boards, etc.

Food- The Program Coordinator will be responsible for purchasing food for each session related to the food currently available at the food pantry for the cooking demonstrations and cooking skills program components. Estimated total costs are $6,480 = $3/per serving x 90 participants x 24 sessions.

Educational materials: This includes educational books, handouts and other materials for the Nutrition Educator to share with participants throughout the program. Educational materials will include healthy recipes, cooking safety tips, and meal planning and budgeting tools. Estimated total costs are $810 = 3 items at $3/each x 90 participants.

Rent/utilities- Rent and utilities expenses are being provided in kind by the program host site, Our Lady of Solace food pantry.

Indirect costs- Indirect costs were calculated at a rate of 24%.

Commented [m17]: Budget says 22%

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GRADE: 18.5/20

GRADE: 18.5/20

Reaching-Out Community Services: Level Up Program
Addressing Unemployment Among Young And Middle Aged Adults In Brooklyn

In alphabetical order:

Final Proposal
Professor Meredith Manze
COMHE 753.01: Health Program Planning and Funding
May 21, 2015

Reaching-Out Community Services
7708 New Utrecht Avenue
Brooklyn, NY 11214

May 21, 2015

, V.P., Global Grants Manager State Street Foundation

1 Lincoln Street
Boston, MA 02111-2900

Dear

I am writing to submit a proposal to the State Street Foundation. We are requesting a grant of $268,517 to provide English as a Second Language classes, GED classes, and job skills training to the underserved, low income population between the ages of 16 and 44 in Brooklyn, New York. These programs will allow capable participants of Reaching-Out Community Service's (RCS) food pantry the opportunity to improve their economic status so that they no longer need to rely on RCS' services.

We understand that your foundation primarily donates to programs seeking to improve community sustainability through education and job force development programs. We would like to improve the conditions in our neighborhood by providing education and skills training to our participants. We hope that you will be able to help us achieve some of our goals in the upcoming year.

We believe this grant of $268,517 will be paramount to our success and can allow us to expand our range of services. Please call our office at (718) 373-4565 if you have any questions.

Sincerely,

Executive Director

Reaching-Out Community Services
A Request for Funding to State Street Foundation

Submitted By:

Founder, Executive Director
Reaching-Out Community Services
7708 New Utrecht Avenue
Brooklyn, NY 11214
Phone: (718) 373-4565
www.rcsprograms.org

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EXECUTIVE SUMMARY:

Reaching-Out Community Services (RCS) is a multi-functional service organization located in the Bensonhurst neighborhood of Brooklyn, New York. It was established in 1989 and incorporated as a 501(c)(3) in 1992 by Thomas Neve, a Brooklyn native who recognized that his neighbors needed a helping hand. From its humble beginnings handing out food and clothing from a van, RCS has grown into a supermarket-style client-choice food pantry and social service referral organization serving over 3,000 individuals in the Brooklyn community.

In the United States, unemployment affects over four million people between the ages of 16 and 44. In Brooklyn, 196,635 people are unemployed, of which 70% are between 16 and 44 years old. RCS has identified poor English skills and low education levels as significant barriers to attaining employment in this community. Long-term unemployment has negative health consequences such as depression, anxiety, and other stress-related conditions, as well as an 83% increase in conditions such as hypertension and diabetes. Therefore, we hope to address the unemployment problem by providing training to current clients aged 16-44 in English proficiency, General Education Development (GED), and job readiness. Our *Level Up* program will give our clients the skills and training they need to attain employment and break free from dependency.

It is our belief that with the training and skills provided by RCS, our clients can become more proficient in reading, writing, and conversational English. Coupled with training in both GED classes and job readiness skills, they will have the tools they need to succeed in the job force. We are asking for $268,517 from the State Street Foundation in order to implement this program. With this generous grant, we will be able to serve 250 people over two years. We believe that a partnership between the State Street Foundation and RCS will truly help our community.

Commented [m1]: This entire section needs references

STATEMENT OF NEED:

In the United States (US), 5.5% of the population ages 16 years and over are unemployed, representing a staggering 8.7 million individuals.[1] Adults ranging from ages 16 to 44 comprise the majority (52.9%) of unemployed individuals in the US, whereas this same age demographic represents 70% of the unemployed in Brooklyn, New York, equating to over 137,000 people.[2] Studies have shown that as education decreases, weekly earnings decrease and unemployment increases.[3] Nearly 70% of Brooklyn residents do not have a college education.[2] While the education levels are low, of far greater concern is the prevalence of low English proficiency, largely due to a high foreign born population. 50% of residents in Brooklyn speak a language other than English and more than half consider their English speaking "less than very well."[2] Studies have suggested poor English is often accompanied by low education levels and jointly serve as significant barriers for most individuals to attain employment.[4, 5] Reaching-Out Community Services (RCS) aims to address the needs of unemployed young and middle aged adults in low-income communities in Brooklyn by providing job training, advancing education, and offering English as a Second Language (ESL) courses.

Long-term unemployment can have detrimental effects in terms of future productivity, overall health, retention of job skills, and the ability to secure future employment.[6,7] In a systematic review, being unemployed led to a breadth of poor health outcomes related to the inability to afford care or stress-related conditions such as depression, anxiety, and even suicide.[8] Added financial strain, updating one's résumé, job searching, and interviewing can lead to self-defeating cognition and negatively impact long-term mental health.[7,8] Beyond psychological health, unemployed individuals face greater physical health issues with an 83% increase in forming new conditions such as hypertension, arthritis, and diabetes.[8,9] Additionally, foreign born individuals and minorities experience larger health inequalities, leading to poorer health

outcomes and higher mortality rates compared to a native population.[5] Furthermore, unemployment insurance programs alone cost $520 billion in 2012, not accounting for indirect costs of physical or mental health issues due to unemployment.[10]

According to Wanberg et al., reemployment success is dependent on the labor market's need, the individuals' human capital, defined as his/her job-related knowledge and ability, and social capital, which is the ability for individuals to access information on career opportunities.[11,12] Based on this model, employment-related programs that enhance job readiness skills and assist in establishing social capital could be beneficial to unemployed individuals. One featured program that has been well-researched is the JOBS program, from the University of Michigan, which aimed to improve job search skills and was found to demonstrate higher levels of employment, higher monthly income, and lower levels of depression after a two year follow up.[8] Overall, a significant drawback of current interventions is that very few programs, if any, actually focus on skill upgrading, and the majority lack assistance with culture, language, and education barriers. Several studies have noted that differences in employment across racial and ethnic groups may occur as a result of differential skills.[8] Thus, interventions would need to be tailored by offering ESL courses jointly with job readiness to cater to the Brooklyn demographic to improve reemployment rates and living conditions by minimizing racial disparities in health.[13]

RCS aims to address the barriers faced by the low-income communities of Brooklyn, equipping them with marketable workforce skills, and providing them with exposure to potential employment opportunities. Numerous young and middle aged people (of age ranges 16 to 44 years old) are currently reliant on RCS' food pantry due to unemployment. Training and placement for those who are unskilled or lacking resources will aid individuals to "level-up" and become self-sustainable and thus reduce their reliance on current food pantry services.

Commented [m2]: How many?

PROJECT GOALS/OBJECTIVES:

To reduce the unemployment rate among individuals who use the RCS pantry, RCS has created a program titled *Level Up*. *Level Up* offers educational resources such as English as a Second Language(ESL), General Education Development (GED), and job readiness classes to help decrease the perpetual cycle of unemployment due to lack of adequate resources in low-income communities in Brooklyn, New York. With the aid of educational instructors and equipment, clients will not only learn technical and educational skills but also develop self-confidence to aid in achieving future success.

Goal 1: To increase English language proficiency among class participants via ESL classes offered by RCS

Objectives:

- Enroll 25 participants in each ESL class for each semester
- Increase in proficiency among 50% of participants in writing and reading English by non-native English speakers after completion of one semester of the program
- Improve conversational English among 75% of participants after completion of one semester of the program

Goal 2: To increase the number of participants who attain high school credentials through GED courses offered by RCS

Objective:

- Enroll 25 participants in each GED course for each semester
- 50% of participants obtaining GED or high school equivalency within 1 year after completion of GED course

Goal 3: To increase job readiness skills for participants through job training course offered by RCS

Objectives:

- Enroll 25 participants in each job training course for each semester
- Develop resume among 100% of participants with updated relevant skills after the first semester
- Increase in job searching ability among 75% of participants through the completion of at least 10 job applications per month by the end of the second semester
- Obtain a minimum of 3 interviews among 75% of participants after completion of both semesters to demonstrate interview preparedness (e.g. simulated interviews, appropriate apparel, professional etiquette)

METHODS:

To apply for these classes, participants must be within the age range of 16 to 44 years old, as this age range constitutes the greatest unemployment rates in Brooklyn. In order to ensure that all students are given individual attention, there would be a maximum student to teacher ratio of 20:1.[14] RCS will work in partnership with several local organizations and educational institutions—libraries, The People's United Community Foundation, Inc.—to obtain both educational and administrative resources—instructors, donated space at schools, and printing. Three to four instructors will be recruited with two part-time program coordinators to efficiently administer each class. Courses will be offered on a semester basis, allowing participants to register for the following semester upon completing one course. Upon completion, students will be awarded a $100 gift card.

Commented [m3]: Why would you need 6 people to conduct each class?

The *Level Up* program will include an ESL, GED, and job readiness course.

1. The ESL course will be held twice a week for 1.5 hours over a 15-week semester. This will help prospective students of the ESL program improve their levels of English, adapt to life and culture in America and increase their self-confidence. In this class, students will learn conversational English, grammar, reading/writing, listening comprehension, and

Commented [m4]: People are busy so it may be easier to have one longer session once a week

vocabulary. The course will enable students to converse proficiently in English, improve their writing ability, and increase self-confidence in English as a whole.

2. The GED course will be held twice a week for 3 hours over a 15-week semester to help individuals who did not complete high school to obtain high school credentials. The class will cover: Social Studies, Writing, Language Arts/Reading, and Mathematics.[15,16] Pretests will be administered to students to gauge any areas that need improvement. Two subjects will be covered in each class. The GED tests will enable qualified participants to pursue a higher education, obtain a job or job promotions, enlist in the military, and achieve personal goals.[17,18]
3. The job readiness course will be held once a week for 1 hour over two 15-week semesters. This course will cover: résumé writing, mock interviews, and dressing for interview success. This class will help participants gain self-confidence through professional apparel, obtain new job skills, develop résumés and career plans, improve job searching skills via search engine training, and improve their interviewing techniques via simulated interviews.[19]

Commented [m5]: Can the same student come to each course? If so, this is a lot of $ to ask for 25 participants

EVALUATION:

Level Up is designed to give clients equal opportunity to participate in all courses of the program to ensure job readiness. It therefore measures the effectiveness of the program through its participants' progress. In order to appropriately match RCS participants with the most valuable skillset, an initial assessment will be given to all incoming RCS participants to determine their current skillset and register them in the most suitable class. Surveys will be administered and topics will include current interests and previous job experiences the participants enjoyed, and future career aspirations and coursework participants are interested in.

Attendance will be taken at the beginning of each class across all three courses. Upon entry, students will be given a reading comprehension, written, and oral exam to determine

reading, writing, comprehension, and ability to converse in English. Mid-term and final assessments will be given to confirm that students have made progress from their baseline assessments. RCS will request a copy of formal GED certifications to account for which students obtained their GED. Instructors will ensure that each participant has a current resume updated with relevant skills after the first semester. To evaluate the job readiness class, the program coordinator will keep track of job applications submitted per month for each participant. Instructors will have a designated checklist of interview skills, and will evaluate each participant on demonstrated interview preparedness through mock interviews. The program coordinator will keep track of scheduled and attended job interviews for each participant. Overall, long-term psychological benefits and mental health outcomes of this program will be evaluated at the two year mark, using the Behavioral Risk Factor Surveillance System (BRFSS).[20]

Commented [m6]: How long after the program ends?

Commented [m7]: Needs corresponding objective

Course evaluations will be conducted with participants at the middle and end of each semester to assess their perceptions of course content, instructor capabilities and self-confidence levels in each area learned by participants to fulfill the qualitative aspect of the program.

To ensure that instructors are suitable to teach at *Level Up*, annual assessments will be conducted to gauge strengths and areas that require improvement by the instructors. This assessment, likened to participants' initial assessment, will include testing to attest for each instructor's ability to teach their courses.

SUSTAINABILITY:

As *Level Up* seeks to enhance education levels and one's confidence in finding and obtaining a job, the program's contributors are well invested in the program's mission. In addition to their certifications before their work with *Level Up*, volunteers and staff are required to enrich their qualifications through independent online training. In this manner, they remain

current on new teaching techniques and refresh their knowledge in their respective field to provide the best for their students. However, your generosity to aid *Level Up* will also assist with training incoming staff. All certified instructors teaching each course will be trained and will then train incoming volunteers. This in-house training will decrease the need for funding for future training in the subsequent years.

With supplementary help from The People's United Community Foundation, Inc., *Level Up* plans to run a two-year program with the indicated number of participants. As our evaluations from the participants will be conducted mid and post year, we will be able to note our areas of weakness and begin to rectify them before the new year begins. A contribution from your foundation will enable *Level Up* to offer GED, ESL and job readiness courses twice a day in the following years as the demand for the courses increases due to the rising number of applicants and their revolving schedules. Although there will be more classes, there will not be a need for new staff as courses will be offered after 5 P.M., allowing the current staff to maintain their current schedules with minor adjustments.

Level Up also wishes to collaborate with local high schools. In an attempt to resolve the issues before they progress, local high schools will work in tandem with at-risk youth, their parents, guidance counselors and *Level Up* program coordinators to discuss possible placement in the program. The schools will donate resources such as old textbooks and library books, decreasing our need for resources while increasing the productivity of its participants.

RCS' *Level Up* aims to enable people of low-income, those lacking skills and resources, with the skills to become self-sufficient so that they may become confident, active members of society. Your assistance will give hope and confidence to people, thus reducing the burden of the economically disadvantaged, fostering development and empowerment.

Commented [m8]: Nice demonstration of sustainability

ORGANIZATION INFORMATION:

In 1989, Thomas Neve recognized that the homeless of Bensonhurst, New York, were in need of services and had nowhere to turn. He purchased a van and began meeting some of these needs daily in a mobile out-reach program, serving meals, giving out clothing, and referring his neighbors to shelters and programs. As demand for services increased, he rented a storefront to operate out of, storing food and developing more services. In 1992, Reaching-Out Community Services (RCS) was formed and incorporated as a 501(c)3.[21] By 1996, the food bank portion had become the first client choice supermarket-style pantry. Rather than distribute uniform packages determined by staff, RCS understands that clients come from all backgrounds and gives them the opportunity to choose foods they would like to serve in their homes. In 2007, RCS opened its new location on New Utrecht Avenue, where it remains today though its doors are bursting with increasing demand. Currently, RCS serves over 3,300 low-income families and individuals from over 16 different postal codes. RCS operates five days a week and the food pantry is open late on Thursdays to accommodate working clients.[21] Thomas Neve remains at the helm of this organization and you can often find him working directly with clients, distributing food or connecting them with other services. RCS is committed to providing services in a dignified and humane manner. Services include:

- Supermarket-style food pantry—clients choose the food they receive from the pantry
- Social Service assistance—referrals provided to Medicare, Medicaid, housing assistance (Section 8), Access-a-Ride, Home Energy Assistance Program, and more
- Electronic Food Stamp Submission Site—clients do not have to visit a food stamp office but can apply electronically at RCS
- Free tax preparation assistance—provided by IRS certified volunteers

- Workshops—nutrition and health education, computer skills, free blood pressure screenings
- Family Support Fund—connects families in need of essential items, beds, furniture, with people who donate such items
- Summer tutoring—for grades 2-8, 3 days a week, 2 hours per day
- Seasonal activities—includes giving children back-to-school supplies, providing Thanksgiving dinner to families, and acquiring Christmas gifts for children

RCS relies heavily on 18 dedicated volunteers who perform tasks ranging from restocking pantry shelves, assisting clients in choosing food, bagging food, and office work such as preparing mailings, copying, and other administrative duties. There are three full-time employees including Tom, the executive director. The board of directors and trustees include attorneys, bank managers, and web developers.[21]

Mission Statement: "*Reaching-Out Community Services in Brooklyn, New York leads the effort to eliminate hunger in our community by providing food, a food bank pantry, social services and programs that inspire self-reliance and community empowerment in a dignified manner.*" [21]

Commented [m9]: Nice overview of org

RCS recognizes the need and potential for clients to "level-up," wherein these clients who have the capacity to learn new skills can do so in order to improve their economic status and break free of the need for food pantry and social services.

CONCLUSION:

Reaching-Out Community Services already meets several needs of the Brooklyn community, and meets them with compassion and dignity. Though we have a great relationship with our clients, we would love to see the day that they no longer rely on us for food, clothing, or social services. It is clear how dedicated we are to our mission because of our strong volunteer base and our founder, Thomas Neve. Through our *Level Up* program, we believe that our current and capable community will gain the skills they need to free themselves from dependency. Not only will they gain proficiency in English, job skills, and knowledge, they will gain self-confidence and empowerment to achieve their goals.

A generous grant of $268,517 from the State Street Foundation would allow us to extend our hand a little further and bring our clients into a life of self-reliance. Together we can break the cycle of financial insecurity and create a sustainable community. We hope you will join us as we lay down the foundation for a brighter future in Brooklyn.

BUDGET:

ITEM	Salary	%effort	COST	Year 1 Total (2 semesters) 15 weeks x 2	Year 2 Total (2 semesters) 15 weeks x 2	Year 2 Total (4 semesters)
Personnel						
Program Coordinator	45,000	100	45,000	45,000	45,000	90,000
Fringe rate (25.9%)			11,655	11,655	11,655	23,310
Total key personnel				56,655	56,655	113,310
Non-Personnel						
Temporary Employees5/13/2015						
ESL Instructor (3 hrs x 30 weeks @ $17.50 per hr)			1575	1575	3150	4725
GED Instructor (6 hrs x 30 weeks @ $20.00 per hr)			3600	3600	7200	10800
Job Readiness Instructor (1hr x 30weeks @ $17.50 per hr)			525	525	1050	1575
Total non -personnel			5,700	5,700	11400	17,100
Other Direct Cost						
Phone				180		180
Postage				900	900	1800
Office Supplies				5,000	5,000	10,000
Educational Supplies				4,500	4,500	9,000
Educational Material				3,700	3,700	7,400
Copy/Printing				1,400	1400	2,800
8 laptops				7,472	7,472	14,944
Office Furniture				1,500	1,500	3,000
Metro Card (5.50 x 125)				690	690	1,380
Advertising Material				2,000	2,000	4,000
Incentives(100 x 125)				12,500	15,000	27,500
IT support				1,200	1,200	2,400
Total other-direct cost				41,042	43362	84,404
Total Direct Cost				103,397	111,417	214,814
Indirect cost @25% yrs 1 and 2				25,849	27,854	53,703
TOTAL COST				129,246	139,271	268,517

Commented [m10]: You list personnel under "non-personnel" category

Last column isn't clear- should just be "total" not year 2 total

It's a lot of $ to help 75 people at most (maybe even as few as 25 if they can take all 3 courses)

BUDGET JUSTIFICATION:

Personnel: **Program Coordinator:** Program Coordinator will be full time (35 hours, yearly salary $45,000) and hold a bachelor's degree. Because of the vast range of Brooklyn residents served, coordinator must be at least bilingual in English and Spanish in order to cater to this target population. He or she will direct the overall operation of the *Level Up* program and oversee, implementation of project activities, coordination with other agencies, organizations, schools or programs, registration of students, hiring the instructors for all three courses, and creating schedules for classes and instructors. Fringe benefits for the program coordinator are calculated at 25.9% ($23,310 for years 1 and 2) and include health insurance, unemployment compensation, and retirement.

Commented [m11]: If this person isn't involved in running the actual sessions, it likely won't take 100% of his/her time.

Non-Personnel:

Commented [m12]: These are personnel! They're just not full time.

- **ESL Instructor**: ESL instructor will be part-time ($17.50 per hour) and must have an ESL certificate and a minimum of two years of experience teaching basic skills to adults. He or she must be bilingual. Payment will increase in year 2 for additional classes.
- **GED Instructor**: GED instructor will be part-time ($20.00 per hour) and must have a bachelor's degree and a minimum of two years of experience teaching basic skills to young adults. Must have experience in creative curriculum planning and development. He or she must be bilingual. Payment will increase in year 2 for additional classes.
- **Job Readiness Instructor:** Job Readiness instructor will be part-time ($17.50 per hour) and must have a bachelor's degree and a minimum of three years of prior group teaching or training experience, of which at least one year must have been with adult students in underserved neighborhoods. He or she must be bilingual. Payment will increase in year 2 for additional classes.

Commented [m13]: It's unclear from looking at the budget why the cost doubles in year 2. It doesn't look like the program is being offered more often.

Other Direct Cost:

Phone: Phone will be available for students to make phone calls with.

Postage: To mail out any necessary documents for the program or students.

Office Supplies: Pens, pencils, printing paper, computer supplies etc. to be used by staff members to carry out daily activities.[22]

Educational Material: Student workbooks, booklets, textbooks, teacher's manual, exam material for GED and ESL courses and worksheets for the Job Readiness Course.

Copy/Printer: To carry out grant activities and support the work being done for *Level Up*.

8 laptops: One laptop for the program coordinator, and 2 laptops for volunteers assisting the program coordinator to be used for general program related duties, including email and Internet access. Three laptops will be for job readiness course students to create resumes, write cover letters, search for jobs, send emails, etc., and one for general use.

Office furniture: To purchase desks and chairs to use as student workstations.

Metro card vouchers: To distribute round trip Metro Card ($5.50) to cover traveling expenses.[23]

Advertising Material: To cover expenses of making copies of fliers or pamphlets at Kinko's.

Incentives: Each student will receive a $100 gift card upon completion of their courses.

IT support: For on-call IT support.

Other: Electricity, Gas, Rent [24]

APPENDIX 1:

Board of Directors and Officers

Name	**Title**
Kimberly Fasano	Chairperson
Francine Russo	Vice Chair
Bob Aronson	Secretary
Rosemarie Gentiliaco	Treasurer
Jerry Albano	Trustee
Ilene Sacco	Trustee
Brian Chin	Trustee
James Tartamella	Trustee
Bobby Giurintano	Trustee

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Are rates of obesity among participants in the *2013 NYC Community Health Survey* significantly different for those who consume less than 12 ounces of soda versus 12 ounces or more?

Commented [m1]: Excel spreadsheet not uploaded or emailed by the deadline

Methods:

For our research, we used the 2013 NYC Community Health Survey (CHS). This is an annual survey conducted by the NYC DOHMH in order to better understand the health and risk behaviors of New York City residents while tracking key indicators of said behaviors over time.[1] The survey population included adults 18 and over with a household landline or cell phone. The questions included were based on the following topics: mental health, general health status, access to care, cardiovascular health, alcohol consumptions, smoking, HIV, and more. [1] Upon obtaining this information, the CHS uses a stratified random sample to create neighborhood and citywide estimates.[1]

Commented [m2]: Add # of participants

The nutrition section of the CHS asked various questions about consumption of sweetened beverages such as "Average number of sodas per day, drink two or more sodas per day, average number of *other* sugar-sweetened beverages per day, and etc."[3] However, to narrow down to our research question, we focused broadly on the CHS question of what size of sugar sweetened soda do participants usually drink. This gives us a better idea on the impact portion sizes have on BMI. As for the BMI component, the height and weight were self-reported by participants. The NYC Community Health Survey coded BMI in different ways such as one variable would include very obese and another variable would include under/ normal category together. For our area of interest, we sorted and categorized the BMI into obese and not obese categories. Nevertheless, some of the BMIs were close to 30, indicating that he/she may be at risk to obesity, which should also be considered for health purposes.

As per the CHS data, we will use the estimates to conduct an analysis on the rates of obesity based on participants self-reported Body Mass Index(BMI) and soda consumption. The Center for Disease Control and Prevention (CDC) website recommends no more than 8 ounces of soda consumption.[2] In this analysis, 12 ounces of soda consumption will serve as the recommended amount and baseline for our research. For the BMI guidelines, we used the CDC website as a reference to classify participants' with a BMI of 30 or higher into the "obese" category and participants with a BMI of 29.9 or lower into the "not obese" categories. This does not include participants who did not respond or responded with "blank" for BMI and size of sweetened soda consumed.

The research study was conducted using a two-by-two contingency table to classify the responses to one question from the 2013 CHS - "When you drink sugar-sweetened soda, what size do you usually drink?" Respondents were given the option of less than 12 ounces, 12, 16, 20, 32 ounces, or more than 32 ounces. When looking at the exposure status for this study, respondents were classified as "obese" or "not obese" based on their BMI. The determination of what is obese versus not obese was made by consulting the Center for Disease Control and Prevention (CDC) Body Mass Index chart.[2] The second exposure status was sugar-sweetened soda consumption (SSB). Respondents would be categorized based on their consumption of "less than 12 ounces of soda" or "more that 12 ounces of soda." Despite there being more options for soda consumption, to simplify our statistical analysis, responses were grouped as mentioned.

We chose this statistical test because our variables were categorical. This allowed us to determine the significance of our results and easily identify any differences between the observed and expected values. In other words, we were able to determine if there is a significant

Commented [m3]: But I thought you changed your analysis so this included those who reported drinking 12 oz. (as per the feedback to all on your oral presentation, and your title indicates)

Commented [m4]: This section has the right information but it jumps around a lot from talking about obesity variable to the soda variable; keep mention of each in the same place

association between the two variables - obesity and ounces of soda consumed. Our null hypothesis, is that there is no significant difference between the amount (less or more than 12 ounces) of sugar-sweetened soda consumed, in relation to obesity. Our alternative hypothesis, is that there is a significant difference between the amount (less or more than 12 ounces) of sugar-sweetened soda consumed, in relation to obesity.

Results:

Descriptive results shows that 33% of the sample drank less than 12 ounces of soda, whereas 67% of the sample drank more than 12 ounces of soda(Table 1, Figures 1 and 2). The descriptive results also show that 31 % of those who are obese drank less than 12 ounces of soda, and 67% of all those who are not obese drank more than 12 ounces of soda (Table 2). Additionally, 69% of those who are obese drank more than 12 ounces of soda and 33% of those who are not obese drank less than 12 ounces of soda (Table 2). This results are important because it shows that among the obese, people who drank more than 12 ounces of soda represent the 69% which indicates that there is a relationship between obesity and amount of soda consumption (>12 ounces).

Commented [m5]: So it's looking like you didn't take the feedback to include those who responded that they drank 12 oz. of soda into one of these groups; this leaves out important information and may change the results

Commented [m6]: I gave feedback on the oral presentation that this comparison doesn't make sense. Needed to updated to compare the same variable across the comparison groups

The Chi square test (Figure 3), gave us a P-value of 0.387 which is greater than the alpha, 0.05. Hence, we accept the null hypothesis. There is not enough evidence to suggest that there is a significance difference in rates of obesity by amount of soda consumption. In addition, there was not enough difference in percentages based on the descriptive results: Those who consumed less than 12 ounces of soda were 31% obese and 33% not obese. Those who consumed more than 12 ounces of soda were 69% obese and 67% not obese (Table 2).

Assuming that the amount of soda consumption had no effect on the rates of obesity, we would obtain the observed difference or more in 39% of the study due to chance.

Discussion:

Reflecting on our study's results of the test of significance, we have not found a link between soda consumption and obesity rates in the sample of adults in NYC. However, our descriptive results suggest that there might be a link between obesity and soda consumption since a greater percentage of soda consumption of 12 or more ounces was observed among obese participants compared to those who were not obese. In other words, our study shows that soda intake might be a risk factor for obesity among adults. Similar to these results, extensive literature has also reported that soda consumption is positively associated with obesity, and hence, it is a risk factor for obesity among American adults. Research including a number of cross-sectional, experimental, prospective cohort and other studies revealed this positive relationship between obesity and soda consumption.[3,4,5,6,7,8] For instance, three studies have illustrated that higher sugary drink intake during early years of life (childhood/adolescence) provoked excess weight development in adulthood.[3, 4,5] A 2009 study actually found that adult population consuming one or additional sodas or other sugar-sweetened beverages on a daily basis have a twenty-seven percent higher likelihood of suffering from being overweight or obese.[6] Furthermore, a study conducted over 20 years using 120,000 males and females reported that individuals who raised their sugar-sweetened beverage (e.g. soda) intake by single 12-ounce serving per day experienced greater weight gain or an additional pound every 4 years, over the course of the study's duration.[7] One other group of researchers investigated whether reducing soda intake would actually promote weight loss among obese adults.[8] Interestingly, they found that a decrease in sugar-sweetened drink consumption of 1 serving per day was linked with a weight reduction -0.49 kg at 6 months and 0.65 kg at 18 months of intervention. [8]

Based on the results of our statistical test and existing literature on the topic of sugar-

Commented [m7]: Feedback given on the oral presentation that 2% difference is not enough to suggest any real difference.

sweetened beverage consumption and obesity, there are several recommendations that can be made. There is existing literature that states sugar-sweetened soda consumption as a risk factor for obesity.[3,4,5,6,7,8] In contradiction, there are studies that didn't find a significant difference in obesity rates based on sugar-sweetened soda consumption and hence, concluded that soda intake is in fact not a risk factor for obesity.[9,10] Moreover, a group of researchers claimed that certain studies reporting positive relationship between soda intake and body weight did not control for critical confounders (e.g. physical activity) and/or utilized untrustworthy dietary assessment techniques.[11] Further research on this topic will help clarify the risk factor(s) and present ways to effectively address them. It can lead to new and/or improved intervention programs, tactics for health education and promotion, and also increase public knowledge of the topic.

Alongside further research on sugar-sweetened beverage consumption, there is a need for research on individually sugar-sweetened beverages and its link to obesity. For example, a lay person may conclude that SSBs only consists of sugar-sweetened soda. Why? Because many existing public health intervention programs make sodas the forefront of their marketing. There are other sugar-sweetened beverages such as iced teas, sports drinks, and energy drinks that are rapidly growing in consumer markets and have the potential to be risk factors for obesity. New research on individual SSBs will provide further detail on what specific beverages create the highest risk for obesity and which do not.

Lastly, increasing the duration of research trials on SSB consumption and obesity will ensure the validity of the studies. A systematic review on sugar-sweetened beverage intake and weight gain states that short term trials of a year or less, result is soda consumption increasing the risk for obesity.[12] In the same review, it states that some long term trials did not show this

risk factor.[12] By increasing the duration of research trials, it will create a more reliable consensus of risk factors for obesity based on BMI.

It can be noted that obesity research in public health is becoming increasingly popular. Many even refer to obesity as the "new smoking" among the public health field's concern. [13] Smith Ward states in his article, "Obesity is associated with a 36% increase in health care spending."[14] Statistics such as these increase public policy to address these issues because it is causing disease burden among adults and children along with increasing the cost of health care. Some public policy approaches that are seeking to address this concern are the new nutrition fact labels, which make nutrition labels such as those found on sugar-sweetened beverages, easier to read by the lay person. One other conversation that is currently happening within public health and policies is increasing the taxes on sugar-sweetened beverages while simultaneously decreasing the costs of healthier beverages. This is an implication for policy because advocates are debating the validity and necessity for this change. Nevertheless, it may increase healthier food choices among the public because neighborhoods, such as low-income neighborhoods, will have easier access to these options - thus reducing the risks for obesity.

Obesity being an epidemic; alongside the lack of detailed literature on how food and/or sugar-sweetened beverage intake plays a role - rates will continue to soar. In terms of the correlation of sugar - sweetened beverages to obesity, there can be an issue with identifying valid risk factors and increasing awareness on obesity. For example, this study concluded that sugar-sweetened soda consumption is a risk factor for obesity which allowed it to fit in with the existing literature but also oppose to some others. This is the crucial factor which determines that there needs to be more research done. As previously stated, obesity is noted as the "new smoking," which can be defined as a topic of high interest and controversy. The results of this

Commented [m8]: Good recommendations

Commented [m9]: This could be paraphrased vs. direct quote

Commented [m10]: Statistics don't increase policy but should influence policy

Commented [m11]: reword

Commented [m12]: this isn't a sentence

statistical analysis are one of many hoping to provide more insight and effectively address this topic from a public health perspective.

Commented [m13]: You included most of the relevant information, but unfortunately the paper doesn't sound like it was written in the same voice. I imagine this is a result of the lack of effective group work. I also gave specific, detailed feedback on the oral presentations for you to incorporate in this final analysis that was largely ignored.

Tables:

Table 1: Obese/Not obese people by soda consumption.

		Obesity based on BMI: Yes 30.0 and above, No 29.9 and less.			
		Obese (Yes)	Obese (No)	TOTAL N	% of total sample.
Risk factor: Soda consumption by ounces: >12 and <12.	<12 ounces of soda	229	751	980	33%
	>12 ounces of soda	498	1509	2007	67%
Number of Total		727	2260	2987	
% of total sample		24%	76%		

Table 2: Obese/Not obese people based on soda consumption by columns.

	Obesity based on BMI: YES 30.0 and above, NO 29.9 and less.		
		Obese (yes)	Obese (no)
Soda consumption by ounces amount	Less than 12 ounces of soda	31%	33%
	More than 12 ounces of soda	69%	67%
Total		100%	100%
	[a] New York City Community Health Survey 2013[1] [b] CDC Body Mass Index Chart BMI[2] [c] BMI 30 or higher = Obese		

Commented [m14]: percentages could be consolidated into first table

	[d] BMI 29.9 or lower= Not obese **[e] Table does not include participants who did not respond or responded with "blank" for BMI and size of soda consumed**

Appendix:

Figure 1: Bar graphs representing sample numbers of not obese and obese people:

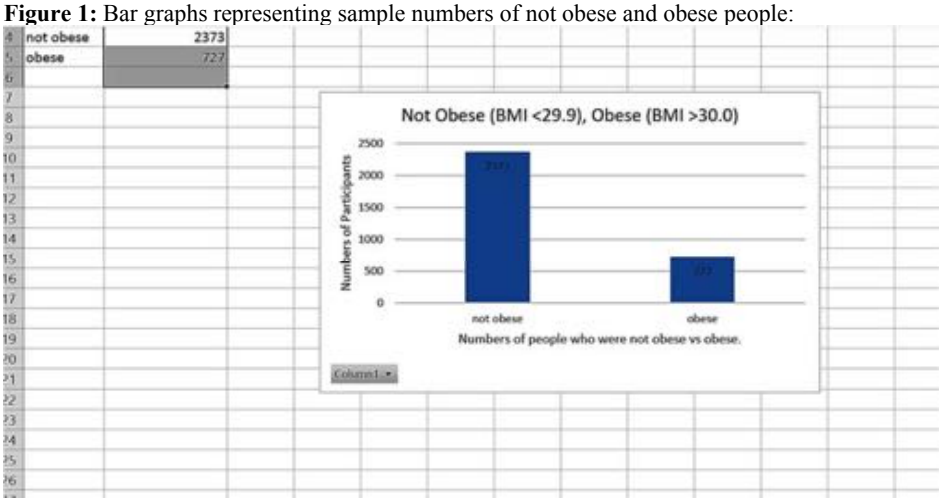

Figure 2: Bar graphs showing number of participants based on soda consumptions.

Commented [m15]: would have been nice to see a bar chart with both variables (obesity and soda size) so we can visually see the differences/similarities)

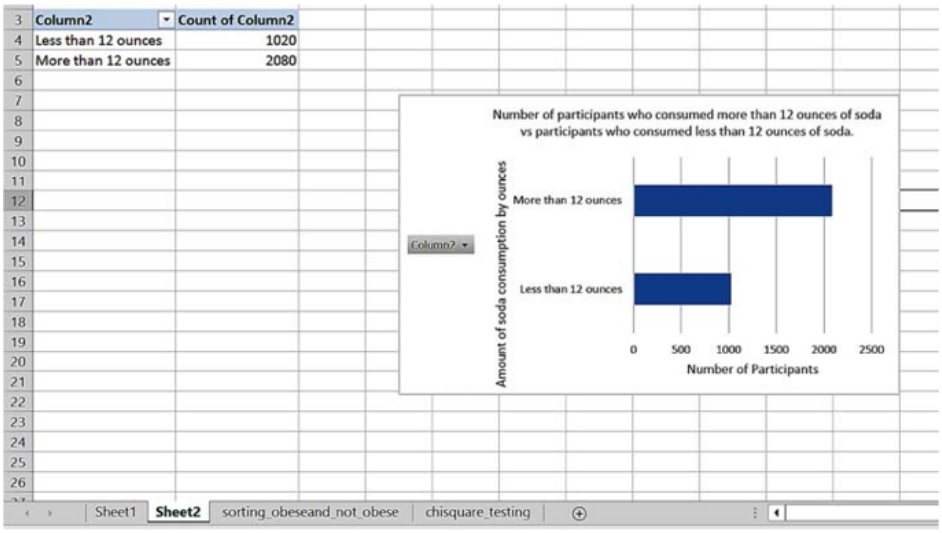

Figure 3: Chi square table used to calculate P-value:

Column1	Column2	Column3	Column
	obesity (based on BMI)		
observed	yes (30.0 and above	no (29.9 and less)	total
less than 12 ounces	229	751	980
more than 12 ounces	498	1509	2007
total	727	2260	2987

Column1	obesity based or	Column2	Column
expected	yes (30.0 and more	no (29.9 and less)	total
less than 12 ounces	238.5202544	741.4797456	980
more than 12 ounces	488.4797456	1518.520254	2007
total	727	2260	2987

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GRADE: 22/25

How are Hispanics affected by gentrification financially and residentially in Bushwick, Brooklyn, New York within the past decade?

COMHE770

1. Introduction

Secondary displacement, or what is known as gentrification, occurs when rising market rents or new developments in a neighborhood cause existing, lower-income residents to relocate.[1] Often, landlords seeking to develop more profitable units may force residents out of their dwellings[1]. Further, displacement can occur when one ethnic group succeeds another in an urban neighborhood, and forces residents to relocate when living conditions become either impossible or unaffordable[1,2]. Gentrification and displacement are common in urban areas where population dynamics and economics are constantly changing.

Commented [MD1]: The connection between ethnicity and income should be made explicit

For instance, the population dynamics, real estate, and crime rates are changing in Bushwick, Brooklyn, New York. The majority, 65% of the Bushwick population was of Hispanic origin in 2010[3]. Overall, the borough has seen a 7.9% population increase over the past decade[3]. Within that rise, white non-Hispanic populations have increased 216.1%, Hispanic populations of all origins have increased by 5%, and other minority groups have all declined between 8.7-42%[3]. Interestingly, Hispanics have declined by 25% and 20%, respectively, in the North Side-South Side, and in East Williamsburg (east of Bushwick)[4]. Within many parts of Brooklyn, new businesses, housing developments, restaurants, bars, and cafes are on the rise, and crime rates have declined. In merely one year, the median sales price for new homes in Bushwick has increased by 28.9% and over the past 5 years by 118.8%[5]. Concurrently, Bushwick, known as the 83rd precinct to the police department has seen a 74.3% decrease in total crime rates since 1990[6]. These patterns are characteristic of gentrifying neighborhoods, and often affect the minority groups within them.

Quantitative data exists about changing demographics and real estate in Bushwick, for example, the cost of rent or neighborhood safety. Yet, data examining the opinions and feelings

of residents has not yet been collected. Researchers know based on government data that Hispanic populations are at least sustaining (and slightly increasing) in Bushwick compared to the tremendous increase in Caucasian populations[3]. However, it is not clear why this is, or how gentrification over the past decade has truly affected the lives of current Hispanic residents financially and residentially. Therefore, it would be meaningful to conduct analysis of how gentrification has affected them thus far, and whether the consequences are positive or negative. It appears as if there are a number of positive features including safer neighborhoods and new developments. However, as tenants and residents report being bought out or sold out and the cost of living quickly rising, these additions could be costing current residents not only financial insecurities, but also housing insecurities. Researchers set out to find: how are Hispanic residents affected by gentrification financially and residentially in Bushwick, Brooklyn, New York over the past decade?

Commented [MD2]: Ok this is what I was looking for in my other comment (now below, #3). This section belongs in the Introduction

Commented [MD3]: You gave a nice background of gentrification and what it means & how it's impacted NYC, but there is no lit review of what is known so far about how gentrification impacts communities.

Commented [MD4]: Add citation

2. Methods

~~Quantitative data exists about changing demographics and real estate in Bushwick, for example, the cost of rent or neighborhood safety. Yet, data examining the opinions and feelings of residents has not yet been collected. Researchers know based on government data that Hispanic populations are at least sustaining (and slightly increasing) in Bushwick compared to the tremendous increase in Caucasian populations[3]. However, it is not clear why this is, or how gentrification over the past decade has truly affected the lives of current Hispanic residents financially and residentially.~~ In order to explore the effects of gentrification, first, quantitative data was collected via secondary sources such as government statistics, censuses, and community maps. After researchers learned about current and past statistics concerning demographics and real estate as well as neighborhood boundaries, researchers set out to collect qualitative data.

Data collection tools included semi-structured interviews with current Bushwick residents. Participants (P.) were recruited from the Bushwick neighborhood, Community Board no. 4[3]. Researchers used a homogeneous sample of Hispanic (Puerto Rican) residents of the neighborhood. Participants were considered eligible if there were of Hispanic origin, 30 years or older, had been living in Bushwick for 8 or more years, and were born in Brooklyn, NY. Study data used in analysis was obtained via audio-recorded and ~~transcripted~~ transcribed interviews with at total of 2 participants. ~~These are~~The participants recruited were both single, working males in their mid 30's who are currently renting apartments in Bushwick. After data was coded, several themes and sub-themes emerged from repeating ideas and codes. These themes were consistent with theoretical framework and guided data analysis.

Commented [MD5]: Why was 8 yrs chosen as the defining criteria?

Commented [MD6]: How were participants recruited? Where was interview conducted?

Commented [MD7]: Add mention of the type of analytic technique (grounded theory)

3. Results

A ~~Combing through the two interviewees transcripts, a~~ few themes ~~came to surface~~emerged when Hispanic participants were asked about their experience living in Bushwick: gentrification, attractions and luxuries present, positive changes in the community, and comfort of remaining in a place where they grew up. A few sub-themes arose such as changing demographics, displacement, increased cost of living and increased neighborhood safety.

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Commented [MD8]: Same comment as in oral presentation that Gentrification as it stands isn't really a theme since that's the topic of the research. Needs to be more descriptive.

3.1 Gentrification is present in Bushwick, Brooklyn, New York.

Neighborhoods were said to be gentrified when they experienced a shift or displacement of populations, when residents were forced out of dwellings by landlords seeking higher profits from rent, and when the overall cost of living in the neighborhood became increased[1].

Commented [MD9]: Is this the formal definition? If so belongs only in the Intro. Here present what the participants defined as gentrification.

Demographics were shifted in Bushwick because of gentrification. P.001 described the historical population of Bushwick compared to the most currently dominating population type:

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> P.001: And then they moved out and the Puerto Ricans and the minorities took over... …Yeah, it has definitely (changed). A lot of White, um, how do you say White professionally? Caucasian people?

~~Participant~~ He implies that a once minority-dominated neighborhood is now seeing a shift towards predominantly White inhabitants.

Next, P.002 spoke of being forced out of his building, evident that displacement is part of gentrification. When asked about his experience renting in Bushwick, P.002 explained;

> P.002: I have to move out first. They want to renovate it and change it completely…So rather than fight it and do all this, I'd rather take what he gives me and move out. And then he'll probably double the rent from what I pay.

The participant is faced with displacement due to his landlord seeking a higher profit on rent. The process described by the participant is a prime example of what is occurring all over the neighborhood.

Not surprisingly, both interviewees report that gentrification causes an increase in the cost of living, a sub-theme dominant throughout the interviews. Gentrification, and thus, increases in rent have steadily crept their way east of Williamsburg and into Bushwick. P. 001 explains why this is occurring:

> P.001: Because Manhattan's getting even more pricier. So everybody's coming over here and they figure 'hey let's raise the rent here as well'.

Therefore, between increased rent and or cost of real estate, current tenants are displaced for renovations and a new population and demographic is taking over the neighborhood. Often found

as a result of changing demographics is increased neighborhood safety or perceived safety as a sub-theme. P.002 spoke of this:

> P.002: You know, my neighborhood's not the safest neighborhood, but it's changed now, so it's a little safer… 'Cause it got more congregated. It got way more people, way more establishments, and then, you know, of course in the beginning what's always going to happen is the kids from the neighborhood who wanna make a quick buck are gonna try rob someone's house or rob someone walking to the train. So now there's more police police presence. They'll always be a cop at the station driving around. So when neighborhoods change like that, police activity tends to go up.

Where there were nicer establishments and increased cost of living, police activity quickly increased.

Commented [MD11]: Something about Safer neighborhoods might then be a theme?

3.2 New, trendy neighborhood attractions are a sign of gentrification

Both participants mentioned an influx of new attractions and trends in their neighborhood. For instance, P.002 describes:

> P.002: Back in 2007 it was changing, but it already had changed. It already had lofts, galleries, uh, restaurants. That's when you know a neighborhood really changed. Like, you can have all the out of town-ers you want. You can have all the White, blue, green, people. But, until you start getting like, restaurants, and you know, cafes, that's when you really know your neighborhood changed.

Furthermore, these attractions appeal to a certain demographic. P.002 hints that the new attractions present in his neighborhood influence and ultimately attract a certain population type:

> P.002: So if there's a new establishment on the corner, you know, some new, some urban, some new trendy restaurant you're not going to get people who grew up here eating there. Maybe the kids, maybe the ones that are cool that transition, but, uh, yeah, most likely you won't get the neighborhood people frequenting your establishments… they'd rather go to the, to Whole Foods or to some nutrition deli that has what they prefer.

Therefore, placement of establishments is key if the neighborhood is to appeal to a certain demographic, and certain establishments may not attract minorities or those who grew up there. Interestingly, despite changing population demographics and relocation, Hispanics living in Bushwick did not want to move, or leave Brooklyn.

3.3 Minorities, especially Hispanics living in Bushwick feel comfortable living in the place where they were born and raised, among one another

Hispanics and other minorities have been living in Bushwick before changes arose, and for most, if not all of their lives. When asked whether participants thought minorities are still living in Bushwick and why, P.001, of Puerto Rican decent, responded:

> P.001: Yeah, we all still live here. Nobody wants to move out…'Cause this is where we were born and raised. Like, you can go wherever you want in the world. But you're always gonna come back here.

Within this idea, it became clear that comfort is key for these populations. P.001further explains:

> P.001: It's my comfort zone. Like, I feel comfortable here…'Cause everybody knows me here for not being a, a thief, or a lowlife or nothing.

Despite neighborhood changes, Hispanics do not want to leave due to a certain level of comfort they feel living in a neighborhood where they all grew up and know one another.

3.4 Despite some negative consequences, gentrification also benefits minorities

Though some Hispanics living in Bushwick may be negatively affected by the increased cost of living and displacement, they also benefit from many of the changes. For example, P.001 admits when asked about changes he has seen:

> P.001: When I was growing up, it wasn't kid friendly in Bushwick. It wasn't kid friendly. The parks was beat up, the slides was… (pause). It wasn't kid friendly. Now when you go to a park, it looks nice.

Once one, or a few elements of a neighborhood become nicer, other facets of the neighborhood followed suit. Besides better care of parks, participants also spoke about increased culture and arts, lower rates of crime, and more things to do in the neighborhood.

Commented [MD12]: Nice review of findings and illustrative quotes

Discussion

Shortly after the new millennium, many Brooklyn neighborhoods started changing. Some of these neighborhoods included Fort Green, Williamsburg, Bedstuy, Crown Heights, and Bushwick. Some of these changes included shifting demographics, displacement, increased cost of living, increased neighborhood attractions, and increased neighborhood security. Not all of the changes current Hispanic residents face who have been living there most or all of their lives are negative. In fact, some of the changes benefit them as well. This study of gentrification through example neighborhood Bushwick, Brooklyn, New York, highlights the positives and negatives of gentrification for Hispanic and minority populations, and the financial and residential affects. The Diffusion of Innovations Theory explains how new ideas, products, and social practices spread within organizations, communities, or societies, and how innovations are communicated

over time[9]. Therefore, those who can keep up, or adapt, so to say, might be able to benefit from the positive changes and avoid the negative consequences.

Perhaps the biggest and most severe consequence of gentrification participants mentioned was displacement. Both participants expressed concern that residents who faced displacement might not be able to afford to stay in the neighborhood once bought out.

> P.001: …people might wanna buy a building and buy you out, but the problem with that is, once they buy you out, and you move somewhere else out where you grew up in, and you can't afford that rent from where they put you in, you're going to the street. So you lost what you grew up in.

Though participants admitted how expensive the neighborhood has become, and that they or friends they knew were victims of relocation, participants mentioned a strong desire to remain living in the neighborhood where they felt comfortable among their own type of people. It seems as if one really wanted to 'make it', and really enjoyed living in the neighborhood, one would ensure they procured the means necessary to remain living there. For example, one participant mentioned working two jobs while another mentioned he is an artist and networks with other artists in the area. Limitations arise from this sample, as both males interviewed are single and do not have any children, thus, lessening the amount of financial responsibility placed upon them.

One of the more positive neighborhood changes includes new attractions and luxuries. Luxuries are defined by researchers in this study as items working class neighborhoods might not have access to. These include an abundance of dogs, restaurants, galleries, lofts, studios, and cafes. Upscale restaurants, cafes, and stores arise as highly visible signs of gentrification in cities all over the world[7]. Participants said they liked these changes, and the fact that they did not have to go far or even leave their neighborhoods to enjoy certain luxuries. Both also recognized that

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increased neighborhood safety was a result of new establishments, and newly renovated homes. Bushwick had once been a town that was crime ridden. ~~:~~

~~P.002: …and years ago this was like, crime ridden area and those were the kind of people, (Blacks and Hispanics), well, not to say those are the kinda people, but they were the kind of people in the neighborhood, so anyone that was here was just, not minding about any of that. Years ago, nobody would have lived here for that.~~

Therefore, there is less tolerance in Bushwick currently for violent behavior and crime, changes anyone should likely welcome.

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As one participant mentioned, current residents might not be likely to frequent new establishments, but those who do make the transition will benefit—those who take advantage of innovations, or the positive changes associated with gentrification will benefit. It was evident that P.002 may be an early adapter, versus P.001 who may still be part of the late majority. P. 001 explains his view on changing demographics:

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~~P. 001: …that's the newest people I'm used to seeing now. I gotta hafta get used to seeing.~~

~~Versus P.002 when asked about how he feels about changes:~~

~~P. 002: Um, I mean, I like the changes, I'm not gonna lie.~~

While P. 002 seems to be taking advantage of and enjoying the new attractions brought into the neighborhood as a result of gentrification, P.001, who has been living in the neighborhood since he was born seems to still need some getting used to them.

Though the neighborhood has seen many positive changes, there are still further improvements needed in Bushwick. One participant speaks of the need for recreation centers, or places where kids can feel safe until parents arrive home from work. Both participants voice

concern for displaced residents who will not be able to afford new dwellings. Most recent minutes from Community Board No. 4 meeting highlight the need for affordable housing, continued development of parks, and high-quality educators in schools[10]. Data from the 2010 Survey Atlas suggest that the community is also battling obesity, lack of physical activity, and lack of health insurance[11]. Innovations need to have meaning in order to powerfully influence populations, and it seems current innovations such as trendy attractions might only be targeting the needs one population group[12]. Perhaps other future neighborhood additions could be more relevant to minority groups like Hispanics. Perhaps what the community needs is not only more trendy attractions, but interventions to help improve the health and well-being of its most underserved residents.

Overall, study findings suggest there are some not so pleasant affects of gentrification in neighborhoods like Bushwick especially for those who cannot afford to remain living where they would like. However, the neighborhood seems to at least benefit from other changes in safety and increased attractions. This study was limited by small sample size and a homogenous ethnic selection. With more time and funding, it would be interesting to hear about how other ethnicities and even other age groups are affected by these changes. Nevertheless, through data analysis, perhaps public health professionals will be able to learn how to better focus on improving issues its underserved communities are facing that could be currently masked by the positive effects of gentrification.

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GRADE: 18.5/20

EPI 752

Final Paper

Professor Kelvin

	Points Allowed	Comments on draft	Comments on final	Grade
OVERALL	I think this paper is worth trying to publish. You might consider the The Journal of school health or The American journal of drug and alcohol abuse.			
Introduction	20	Good, although some edits needed (see suggestions in text) You should discuss foreign born in the intro and also weight control as it seems like an odd thing to adjust for.	The intro was reading really well until you mentioned the two studies that looked at interaction by race – you need to describe those in more detail. What exactly did they find? You only describe the population for one of the studies. What was the population of the other study?	18
Methods	20	I do not understand your logic for excluding those who exercise in the intermediate category. Why not have three categories, low, moderate and high PA and compare moderate and high to low – then you might even see a dose response. Or/also maybe	Looks good, although I wonder about your measure for nativity s it is not really a measure of foreign versus US born. Maybe there is another variable about location of birth you could use>	19

		explore just dichotomizing in the middle to see if you get the same results. What happens if you include the "other" race category? Your justification that the n is small does not really hold-up with >500 people in that group.		
Results	20	On table 1 I would report row percent rather than column percents. You want to know whether the proportion with the outcome differs by exposure not vice versa. See comments in text and tables	Good, but see comments and suggested edits in text.	19
Discussion	20	The discussion needs a bit of work to really focus it on what you found. I am not sure that the findings regarding the covariates are really worth much discussion, but really focus on comparing your	Good, but I might also emphasize that (1) whites and Hispanics were the most likely to drink alcohol in general. In addition, point out that the association between	19

		findings to the literature. What was the racial make-up to the studies in the US that did versus did not find an association between PA and alcohol? Why might there be differences by race? What are the policy implications?	physical activity and alcohol was not significant in the main effects analysis and only became apparent after stratifying on race/ethnicity.	
Other (endnote codes, grammar, etc.	20	Good	Good	20
GRADE			90	95%

Does race/ethnicity modify the association of physical activity and alcohol consumption?

INTRODUCTION

Modifiable risk behaviors during adolescence, such as alcohol consumption, can have a profound effect on morbidity and mortality throughout life. In fact, alcohol consumption during ages 10 to 24 is the most important risk factor for decreasing disability-adjusted life-years.[1] Estimates from the 2013 national Youth Risk Behavior Survey (YRBS) show that 30 days before the survey, 34.9% of youth had consumed alcohol.[2] While the overall prevalence of alcohol use has been decreasing, alcohol remains one of the six leading causes of morbidity and mortality among youth and adults in the United States.[2] Alcohol consumption during late adolescence is associated with alcohol dependence during adulthood, premature death, and compromised work capacity.[3,4] Thus, understanding the factors that affect alcohol consumption during adolescence is important for developing appropriate interventions.

Health behaviors tend to correlate with one another. Research suggests that physical activity protects against participating in certain risk behaviors, such as smoking, and negative health outcomes, such as heart disease, but has been associated with increased alcohol use.[5,6] The link between physical activity and alcohol use is hypothesized to be through common personality, biological, and social mechanisms.[7] One possible explanation is that impulsivity is a shared cause of physical activity and drinking.[8] That is, impulsivity has been connected to sensation seeking, which is associated with increases in both physical activity and alcohol consumption.

Additionally, when assessing physical activity levels in studies, a social-sports effect is likely as well. It has been found that adults who are part of sports clubs are more likely to engage in heavy alcohol consumption.[9] In the U.S., a study specifically among high school and college students found that participation in sports was linked to higher rates of alcohol consumption.[10]

However, the positive association between physical activity and alcohol use is not consistent across studies. Studies in Finland found no association between physical activity and alcohol consumption among adults,[11,12] and a longitudinal twin study in Finland found no association between baseline physical activity and weekly alcohol consumption among adolescents.[13] A study among eleventh and twelfth graders in Florida also found no association between physical activity and alcohol use.[14] In this study, most of the students were White (45%) or Black (26%), all attended the same suburban high school, and the sample size was small (N=822).[14] In contrast, other studies, including a literature review, have found a positive association between alcohol consumption and physical activity among adolescents.[15-17] Higgins et al. (2003) found that among a nationally representative sample of 12,120 Canadian youth aged 12 – 24, alcohol was positively related to physical activity among both males and females.[15] Among 11,741 individuals from the senior classes in American high schools from 1986–2001, Terry-McElrath et al. (2011) found that engagement in higher levels of participation in sports, athletics, and exercise was associated with increased alcohol consumption.[17]

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A plausible explanation for inconsistent findings is that the association between physical activity and alcohol use might be dependent on certain socio-demographic or

cultural characteristics, which can vary across study samples.[18] Some possible ~~moderators~~ modifiers of the relationship between physical activity and alcohol use have been examined. A study among a representative sample of U.S. adolescents found that students who consumed one or more alcoholic beverages in the past 30 days were less likely to be low active than those who consumed no alcoholic beverages. However, after adjustments, this association was found among females, and not among males.[19] A study by Lisha et al. (2011) found that age appears to modify the relationship between vigorous physical activity and alcohol use, and gender appears to moderate the relationship between moderate physical activity and alcohol use~~,~~ among American adults.[18]

Based on estimates from the 2013 YRBS, prevalence of many health-risk behaviors differ by race/ethnicity.[2] The relationship between physical activity and alcohol use may differ by race/ethnicity for several reasons. In 2014, a study found that Whites and Hispanics were significantly more likely than African Americans to have consumed alcohol in the previous year.[20] A study that included Asian Americans found that they also reported significantly lower alcohol use compared to other racial/ethnic groups, ~~while~~ with Hispanic youths reported the highest level of alcohol use.[21] Physical activity also differs by race; results from a nationally representative sample suggest that physical activity is significantly lower among Blacks, Hispanics, and other racial groups.[22]

There is an important gap in the literature in that no one has looked at possible differences in the relationship between physical activity and alcohol consumption by race/ethnicity among adolescents. Two studies began to explore the relationship by race and did not find evidence of interaction between alcohol use and physical activity;[19,23] however, they did not include Asians and neither had the diversity of the New York City

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population.[19,23] One of the studies was conducted among a college-based population in southern U.S.; 49% of the participants were White, while 45% were Black.[23] New York City is a multicultural city, where 1 in 10 residents are Asian,[24] and a high proportion of residents are foreign born.[25] This diversity allows for the exploration of race/ethnicity as modifiers of the physical activity-alcohol consumption association.[26] This population also allows us to consider nativity as a covariate since 37% of the New York City population, including 8.2% of adolescents, are considered foreign-born.[25,27] Further, nativity has been shown to effect alcohol consumption.[28]

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The present study used cross sectional data from the 2013 New York City Youth Risk Behavior Survey to examine the relationship between exercise habits and alcohol consumption among high school students in New York City. In addition, we looked at whether race/ethnicity is an effect modifier of the physical activity-alcohol consumption association.

METHODS

Data

The data from this study come from the 2013 New York City Youth Risk Behavior Survey (YRBS), which is a cross sectional study conducted by the New York City Department of Health and Mental Hygiene (DOHMH) in an ongoing partnership with the New York City Department of Education (DOE). The NYC YRBS is part of the Centers for Disease Control and Prevention's National Youth Risk Behavior Surveillance System. The NYC YRBS used a stratified, two-stage cluster sample aimed at producing a representative sample of students. In the first stage, schools were randomly selected with probability proportional to school enrollment. In the second stage, classrooms in a

designated period or class were listed in a classroom-level sampling frame, and then were selected randomly for each school. One week prior to the survey, parents were sent a letter with an opt-out form that could be used if they decide. The study participants include enrolled students in the selected classes who were in attendance the day of the survey. English as a Second Language (ESL) and special education classes in selected high schools were excluded. During the fall of 2013, 9,439 students in 81 public high schools in New York City completed the 2013 YRBS. The school response rate was 89%, the student response rate was 79%, and the overall response rate was 71%. The results are representative of all students in grades 9 through 12.[27] After the survey was administered, ~~the responses were~~ weights were calculated~~ed~~ to adjust for nonresponse and probabilities of selection.[27]

Measures

The primary independent variable of interest was physical activity not conducted in physical education (PE) class. Determination of physical activity status was made from the following survey question: "Outside of PE classes, in an average week during the school year, on how many weekdays do you play sports or do other physical activities that increase your heart rate or breathing?" Those who reported fewer than 2 days were classified as low active, those who reported 2 and 3 days were considered moderately active, and those who reported 4 or 5 days of exercise were considered high active. This measure was informed by the federal government guidelines for recommended exercise.[29]

The outcome, alcohol consumption, was assessed with the question: "During the past 30 days, on how many days did you have at least one drink of alcohol?" Alcohol consumption was dichotomized into an indicator for having had at least 1 drink of alcohol

during the past 30 days.

Covariates

Socio-demographic characteristics examined included students' age, sex, race/ethnicity, and nativity. These were included based on previous literature.[18,19,22] Age was dichotomized to those who are 16 and older ~~and to those who are~~versus under 16. Nativity was based on response to the following question: "How long have you lived in the United States?" The options included: (1) I have always lived in the United States; (2) Less than 1 year; (3) 1 to 3 years; (4) 4 to 6 years; and (5) More than 6 years but not my whole life. Those who always lived in the Unites States were considered U.S. born, while all other responses were categorized as foreign born. Two questions determined race/ethnicity, "What is your race?" Respondents could choose from the following choices: (1) American Indian or Alaska Native; (2) Asian; (3) Black or African American; (4) Native Hawaiian or Other Pacific Islander; and (5) White. Respondents also indicated whether they were of Hispanic origin. Race/ethnicity was then categorized by the YRBS as White, Black, Hispanic, Asian, and Other (American Indian, Native Hawaiian/other Pacific Islander and multiple).

Statistical Analysis

All statistical analyses were conducted using SAS 9.4, and all analyses took the sampling methods into account and adjusted for the sampling weights. The analysis proceeded in 5 steps. First, we used descriptive statistics to describe the distribution of physical activity and all covariates for the total sample, and then separately by ~~no~~ alcohol consumption status. We used a chi square test to assess the significance of differences by alcohol consumption. Second, unadjusted odds ratios (ORs) using logistic regression

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analysis were ~~used~~ estimated to examine the crude associations between alcohol consumption and physical activity, as well as all covariates.

Third, we ran a multivariate logistic regression model ~~of~~ looking at physical activity, age, sex, race/ethnicity, and nativity as predictors of alcohol consumption.

~~Interaction~~ Forth,

t~~T~~o explore whether race/ethnicity was an effect measure modifier, an interaction term for physical activity times the race categories was added to the multivariate model. If physical activity showed significant interaction with race/ethnicity, in the fifth step separate logistic regression models were run stratified on race to estimate the group-specific association between physical activity and alcohol consumption. The significance level for all tests was set at value of $p<0.05$.

RESULTS

Table 1 provides descriptive statistics for the total sample, including unweighted frequencies and weighted percents, and by alcohol consumption for the ~~9,439~~ sample of 9,439 youth. For the entire sample, the majority of the participants were male (50.78%), Hispanic (38.30%), born in the U.S. (72.12%) and under 16 years of age (52.61%). Approximately 14% of the youth were white, 30.49% were black, 15.88% were Asian, and 1.58% were of other races. Those who were classified as high active represented 25.86% of the sample while those were considered moderately active constituted 26.67%. Nearly 25% of the participants reported drinking at least one alcoholic beverage in the last 30 days. Females were more likely to report alcohol use than males (26.49% vs. 22.72%, P=<0.01), and those who were 16 and above were also more likely to report alcohol use than those under 16 (31.03% vs. 18.85%, P=<0.001). Further, Whites were

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the most likely to report alcohol use compared to all the other races (31.79%, P=<0.001). We found no differences in alcohol use by physical activity or nativity (Table 1).

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Results from the univariate logistic regression models are presented in Table 2. ~~In the univariate logistic regression model, we did not find~~There was no statistically significant associations ~~between those who were moderately~~moderate ~~active~~ (OR: 1.05, P=0.711), ~~those who were high~~or high ~~active~~ (OR: 1.08, P=0.492) activity and alcohol use. ~~, and nativity (OR: 0.93, P=0.348) with alcohol consumption. We found that~~ ~~m~~Males had lower odds of ~~reported~~ alcohol use than females (OR: 0.82, P=0.01), and those who were 16 and above had higher odds of ~~reported~~ alcohol consumption (OR: 1.94, P=<0.001). ~~We found significant differences by race/ethnicity:~~ Blacks had 0.66 times the odds of consuming alcohol ~~than~~ compared to Whites (P=<0.001); Asians had 0.27 times the odds of consuming alcohol compared to Whites (P=<0.001); and those of other races had 0.68 times the odds of consuming alcohol compared to Whites (P=0.044). The association between Hispanics and reported alcohol consumption in comparison to Whites was not statistically significant and nativity was not significantly associated with alcohol use~~.~~

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Results from the multivariate logistic model also showed that being moderately active (AOR: 1.03, P=0.839) ~~and~~ or highly active (AOR: 1.05, P=0.690) were not ~~statistically~~ significantly associated with alcohol consumption. All the results that were significant in the univariate models remained significant after adjustments, with the exception of those of other races and males (Table 2). Blacks had 0.61 lower odds of ~~reported~~ alcohol consumption than Whites (P=<0.01) and Asians had 0.25 lower odds of ~~reported~~ alcohol consumption than Whites (P=<0.001), after adjustments. Those who

were 16 or older had 2.07 times the odds of reported alcohol consumption than those under 16 (P=<0.001).

Interaction Results

When adding the interaction term to the multivariate model, we found that the race and physical activity interaction term was statistically significant (P=<0.001, not shown). After stratifying by race, among Whites, those who were moderately active had 1.75 times the odds of reported alcohol use than those who were low active~~, after adjustments~~ (P=0.047), and ~~. Among Whites,~~ those who were highly active had 1.94 times the odds of reported alcohol use than those who were classified as low active~~, after adjustments~~ (P=0.013). Among those of other races, those who were classified as moderately active had 2.17 times the odds of reporting alcohol use than those who were low active (p-value: .027). ~~The associations for physical activity were not significant for Black, Hispanic, or Asian youth. However, though not statistically significant, those~~among Asians, ~~who~~those who were highly active had 1.85 times the odds of alcohol consumption than those who were low active, ~~among Asians and after adjustments~~although the association was only of borderline significance (P=0.06~~). ~~). Physical activity was not associated with alcohol use among black and Hispanic students. ~~Finally, among all categories of race but those of other races, those who were 16 and above had a greater odds of alcohol consumption than those who were under 16 years of age (Table 3).~~ However, b~~B~~eing foreign born was not statistically significant in the stratified models with one exception: among Hispanics, those who were foreign born had 1.39 times the odds of consuming alcohol than those who were born in the U.S. (P=<0.01).

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DISCUSSION

We believe this study to be one of the first to examine how race modifies the relationship between physical activity and alcohol consumption ~~when considering~~that includes Asians. The results show that among white youth, those who are high active or moderately active have a greater odds of alcohol consumption compared to those who are low active. Additionally, among those of other races, those who are moderately active have increased odds of alcohol consumption, and among Asians there was an association between high physical activity and alcohol consumption that was of borderline significance. We found no association between physical activity and alcohol consumption among ~~Asians, b~~Blacks or Hispanics.

Our finding that the association between physical activity and alcohol consumption is modified by race suggests that cultural and ethnic differences affect this association. Another example of this is the finding that being foreign born was only associated with alcohol consumption among Hispanics. Our results add to previous research that have found a positive association between physical activity and alcohol consumption when considering the modifying effects of socio-demographic variables[18,19] and t~~T~~he effect modification by race/ethnicity may explain why some previous studies ~~found no~~failed to find this association ~~between physical activity and alcohol~~.[14]

The relationship between physical activity and alcohol consumption is potentially linked because of social influences; students who ~~are prone to exercising~~participate in physical activity, especially on sport teams, ~~are~~ may be more ~~likely to be~~ attracted to ~~consume alcohol in~~ social settings that often presents opportunity for alcohol consumption, and may be more influenced by~~due to~~ peer norms and social pressure to

drink as a form of comeraderie.[10] The social influences that affect drinking wais further explained byfound in a previous study conducted among a sample of predominately white (83%) high school athletes. This study found that expecting positive alcohol outcomes (e.g. "I would be outgoing") was associated with higher levels of risky drinking.[30] A possible explanation for our moderation findings that race/ethnicity modifies the association between physical activity and alcohol use among teens is that social factors, such as peer pressure, and cultural perceptions that influence the physical activity-alcohol consumption association also differ by race. In fact, a previous study found that white youth are more vulnerable to descriptive norms (e.g. "how often you think your close friends drink alcohol") than Blacks in relation to binge drinking.[31] Further, a previous study found differences between non-Latino and Latino youth in the social influences, such as perceived social norms, that affect drinking.[32] Social expectations and norms may have a greater influence on white youth who participate in sports. More studies are needed that clarify why the physical activity-alcohol relationship differs by race/ethnicity.

Commented [f11]: I am not sure I understand this

Though the association among Asians was not statistically significant, it was suggestive and the association of physical activity and alcohol use should be explored with larger samplesfurther given that the p-value was close to significant. Although Asians have been found to have the lowest rates of drinking compared to other races, previous studies conducted in East Asia found that Asian college students who participated in both moderate and vigorous physical activity had greater odds of heavy drinking.[21,33] Asians who participate in sports teams may feel social pressure to engage in alcohol consumption. A previous study found that among Asian youth in California, peer

substance use was the strongest predictor of ~~youth's~~ the participant's own substance use.[34]

Alcohol consumption remains a leading cause of death,[2] and understanding the characteristics associated with alcohol misuse is essential for designing effective interventions. Previous studies have acknowledged the importance of understanding student subgroups for targeted interventions.[35] This study suggests that white adolescents as well as those of other or mixed race and Asians who are high or moderately active ~~should b~~might be a ~~the~~ focus ~~of~~ for interventions that target the peer norms associated with drinking.[31]

Limitations

This study has several limitations. First, the observed association should be interpreted with caution given that this study involves cross-sectional data~~,~~ and, as a result, we cannot make inferences on temporal order. Future research that employs a longitudinal design could assess whether youth who begin engaging in sports or physical activity also later consume more alcohol than those who did not begin. Second, all measures were self-reported, which could lead to misclassification errors. Finally, the measures used by the YRBS may not have caught all the aspects of these variables, since the 2013 YRBS did not report if students participated in school sports teams. Consequently, future studies should test the hypothesis that participation in school sports teams may be related to increased alcohol consumption overall and among students of different race/ethnicities~~s~~ as opposed to ~~physical activity in general which includes individual physical activity as well as group sports~~other forms of physical activity.

Conclusions

However, within the limitations of the study design, we believe this study revealed an important modifying factor between physical activity and alcohol consumption. These findings provide support for additional research and initiatives focused on understanding the association between physical activity involvement and alcohol consumption when considering the effects of demographic characteristics. Exploring this relationship further and how it is affected by cultural differences will be important for preventing this modifiable risk behavior. It would also be advisable for health professional to screen for alcohol use among active white youth.

APPENDIX:

Table 1: Demographic characteristics of total population and by alcohol consumption For High School students in the 2013 Youth Risk Behavior Survey, n = 9,439

	TOTAL SAMPLE, n (%) [a]	**No Alcohol, n %)**	**Alcohol, n (%)**	**P-value** [b]
Total	9,439	6,180 (75.32)	2,161 (24.68)	
Physical Activity	7,268	4,838	1,700	0.485
Low, 0 - 1 days	3,363 (47.48)	2,248 (76.02)	725 (23.98)	
Moderate, 2 -3 days	1,891 (26.67)	1,233 (75.08)	469 (24.92)	
High, 4 -5 days	2,014 (25.86)	1,357 (74.53)	506 (25.47)	
Race/Ethnicity	8,953	5,813	2,077	<.001***
White	1304 (13.74)	771 (68.21)	415 (31.79)	
Black	2307 (30.49)	1542 (76.54)	438 (23.46)	
Hispanic	3834 (38.30)	2344 (70.10)	1002 (29.90)	
Asian	983 (15.88)	818 (88.69)	104 (11.31)	
Other	525(1.59)	338 (75.87)	118 (24.13)	
Nativity	9,313	6,059	2,136	0.254
U.S. Born	6,856 (72.12)	4,464 (74.99)	1,627 (25.01)	
Foreign Born	2,457 (27.88)	1,595 (76.43)	509 (23.58)	
Sex	9,375	6,090	2,138	<0.01**

Female	4854 (49.22)	3,153 (73.50)	1,238 (26.49)	
Male	4521 (50.78)	2,937 (77.28)	900 (22.72)	
Age	9,406	6,091	2,152	<.001***
<16	4,655 (52.61)	3,278 (81.15)	803 (18.85)	
≥16	4,751 (47.39)	2,813 (68.97)	1,349 (31.03)	

a) Weighted percents
b) P-value based on an independent samples t-test or chi-square tests for differences in proportions.
P < .05; ***P* < .01; ****P* < .001

Table 2: Unadjusted and Adjusted Logistic Regression Models for Alcohol Consumption— Youth Risk Behavior Survey, 2013

	Sample Size	**Odds Ratio N=9,439**	**95% CI**	**P-Value**	**Adjusted Odds Ratio N= 6,217**	**95% CI**	**P-Value**
Physical Activity	6,538						
Low, 0 -1 days (ref)		1.00	-	-	1.00	-	-
Moderate, 2 -3 days		1.05	0.80 - 1.38	0.711	1.03	0.77 - 1.39	0.839
High, 4 -5 days		1.08	0.86 - 1.36	0.492	1.05	0.82 - 1.36	0.690
Race/Ethnicity	7, 890						
White (ref)		1.00	-	-	1.00	-	-
Black		0.66	0.49 - 0.88	<.001***	0.61	0.44 -0.84	<.01*
Hispanic		0.92	0.72 - 1.17	0.480	0.92	0.72 -1.17	0.487
Asian		0.27	0.18 - 0.41	<.001***	0.25	0.16 - 0.38	<.001***
Other		0.68	0.47 -0.99	.044*	0.69	0.46 -1.05	0.086
Nativity	8,195						
U.S. Born (ref)		1.00	-	-	1.00	-	-
Foreign Born		0.93	0.81 - 1.06	0.248	1.06	0.89 -1.26	0.497
Sex	8,228						
Female (ref)		1.00	-	-	1.00	-	-
Male		0.82	0.69 - 0.96	0.010*	0.93	0.78 - 1.11	0.110
Age	8,243						
<16 (ref)		1.00	-	-	1.00	-	-
≥16		1.94	1.64 - 2.30	<.001***	2.07	1.64 - 2.60	<.001***

P < .05; ***P* < .01; ****P* < .001.

Table 3: Adjusted Race-Specific Odds Ratios (ORs) and 95% Confidence Intervals (CIs) from Multiple Logistic Analyses for Alcohol Consumption Stratified by Race.

	WHITE			**BLACK**			**HISPANIC**			**ASIAN**			**OTHER**		
	N = 1,304			**N = 2,037**			**N = 3, 834**			**N = 983**			**N = 525**		
	ORs	**95% CI**	**P-value**	**ORs**	**95% CI**	**P-value**	**ORs**	**95% CI**	**P-value**	**ORs**	**95% CI**	**P-value**	**ORs**	**95% CI**	**P-value**
Physical Activity															
Low, 0 - 1 days (ref)	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-
Moderate, 2 -3 days	1.75	1.01 - 3.02	0.047*	1.08	0.65 - 1.80	0.763	0.83	0.60 - 1.14	0.238	0.88	0.36- 2.16	0.778	2.17	1.09 - 4.30	.027*
High, 4 -5 days	1.94	1.15- 3.26	0.013*	0.82	0.56 - 1.20	0.400	0.81	0.59 - 1.12	0.203	1.85	0.97 - 3.53	0.060	0.89	0.44 - 1.81	0.740
Nativity															
U.S. Born (ref)	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-
Foreign Born	0.81	0.45 -1.46	0.488	0.77	0.49 -1.21	0.249	1.39	1.12 - 1.73	<0.01**	1.09	0.60 - 1.97	0.780	1.40	0.64 - 3.07	0.401
Sex															
Female (ref)	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-
Male	0.81	0.54 -1.20	0.285	0.89	0.67 - 1.18	0.416	0.80	0.59 - 1.08	0.138	1.28	0.81- 2.02	0.294	1.13	.60 - 2.13	0.712
Age															
<16 (ref)	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-	1.00	-	-
≥16	2.57	1.69 -3.91	<.001***	1.81	1.23 - 2.67	<0.01*	1.98	1.49 - 2.63	<.001***	2.66	1.27 - 5.59	<0.01*	1.68	0.91 - 3.11	0.096

*$P < .05$; **$P < .01$; ***$P < .001$.

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SAS CODE:

Formatted: English (United States)

```
libname yrbs13 'E:\YRBS\';
filename formatin 'E:\YRBS\yrbs13p-formatstatements';
%include 'E:\YRBS\\yrbs13p-formatsnumeric.sas';

data y13; set yrbs13.yrbs2013;
run;

proc format;
 value ynzero
    1 = '1 Yes'
      0 = '0 No';

      value PA
      1 = 'Low'
      2 = 'Moderate'
      3 = 'High';
      run;

*/checking;
proc contents data=y13;
```

```
run;

*checking frequency of race, sex, age, nativity, physical activity and
drinking status;
proc surveyfreq data=y13;
weight WEIGHT;
strata STRATUM;
cluster PSU;
tables race5 nq1 nq2 nq88 nq117 nq43;
run;

*/recode physical activity, alcohol, nativity;
data y13A;
set y13;

age=-9;
if nq1=. then age=.;
else if nq1=<4 then age=0;
else if nq1>=5 then age=1;
label age=Are you 16 or older?

PA=-9;
if (nq117=.) then PA=.;
else if (nq117<=2) then PA=1;
else if (nq117=3 or nq117=4) then PA=2;
else if (nq117>=5) then PA=3;
label PA=Physical Activity;

alcohol=-9;
if nq43=. then alcohol=.;
else if nq43=1 then alcohol=0;
else if nq43>=1 then alcohol=1;
label alcohol=drink alcohol?;

nativity=-9;
if nq88=. then nativity=.;
else if nq88=1 then nativity=0;
else if nq88>=2 then nativity=1;

format age ynzero.;
format nativity ynzero.;
format PA PA.;
format alcohol ynzero.;
run;

*/checking recoding;
proc freq data=y13A;
Tables race5 nq1*age PA*nq117 alcohol*nq43 nativity*nq88;
run;

*/Descriptives;
proc surveyfreq data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
tables nq2 race5 age PA nativity alcohol;
run;
```

```
*/descriptive with alcohol;
proc surveyfreq data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
tables race5*alcohol nq2*alcohol age*alcohol PA*alcohol
nativity*alcohol/row chisq;
run;

***END DESCRIPTIVES***;


***univeraite regressions;
*/proc logistic NEED DESCENDING;
proc surveylogistic data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
class PA (ref="Low" param=ref);
model alcohol (descending)=PA;
run;
*/alcohol consumption by race;
proc surveylogistic data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
class race5(ref=LAST param=ref);
model alcohol(descending)=race5;
run;
*/age;
proc surveylogistic data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
class age (ref=first);
model alcohol(descending)=age;
run;
*/gender;
proc surveylogistic data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
class nq2 (ref=first);
model alcohol(descending)=nq2;
run;
*nativity;
proc surveylogistic data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
class nativity (ref=first);
model alcohol(descending)=nativity;
run;
***Multivariate Model***;
proc surveylogistic data=y13A;
weight WEIGHT;
strata STRATUM;
```

```
cluster PSU;
class PA (ref="Low" param=ref);
class race5 (ref=last param=ref);
class age (ref=first param=ref);
class nq2 (ref=first param=ref);
class nativity (ref=first);
model alcohol (descending)= PA race5 nq2 age nativity;
run;

***multivariate modeles testing interaction***;
proc surveylogistic data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
class race5(ref=LAST param=ref);
class PA (ref="Low" param=ref);
class nativity (ref=first param=ref);
model alcohol(descending)=PA race5 age nq2 nativity PA*race5;
run;

*/domain* stratified result**;
proc surveylogistic data=y13A;
weight WEIGHT;
strata STRATUM;
cluster PSU;
domain race5;
class PA (ref="Low" param=ref);
class nativity (ref=first param=ref);
class age (ref=first param=ref);
class nq2 (ref=first param=ref);
model alcohol(descending)=PA age nq2 nativity;
run;
```

EPI752
Spring 2015
5/24/2015

	Points Allowed	Comments on draft	Comments on final	Grade
OVERALL	Excellent paper. I think for publication you might try AJPH of JAMA pediatrics as a first attempt (it is a reach, but I think the topic is of interest). Other second tier options include Journal of Adolescent Health (http://www.jahonline.org/), Tobacco Control (http://tobaccocontrol.bmj.com/site/about/) or The American journal of drug and alcohol abuse.			
Introduction	20	Very well written	Good	20
Methods	20	Good, but see comments	Good	20
Results	20	Good, but we do not usually report the parameters from a model with an interaction term (other than the p-value for the interaction term). Also, I wonder if it might not make more sense to stratify on e-cig risk perception rather than on intent to quit smoking? In table 1, I would report row percents (usually we want to know the percent within exposure group that has the outcome, not vice versa). Finally, for your class statements,	Good	20

		the syntax should read like: class sex (ref=first param=ref); You need to add the param=ref part as in one case in table 2 your p-value and CI give different conclusions.		
Discussion	20	Good, but ends a bit abruptly. Also, a more detailed discussion of the literature might be helpful.	Good	20
Other (endnote codes, grammar, etc.	20	Good	Good	20
GRADE			97%	100

Electronic Cigarette Use Among Adolescent Smokers: Interaction between Perceptions of E-Cigarette Harmfulness And Intention of Quit Smoking

INTRODUCTION

The majority of adult cigarette smokers begin smoking before the age of 18.[1] Cigarette smoking amongst adolescents has been on a steady decline for many years.[2] However, the electronic cigarette, a non-tobacco product that dispenses vaporized nicotine from a battery-powered cartridge, has recently enjoyed increasing popularity amongst teens, with a 2012 study estimating that 10% of high school students had used the product.[3-6] Given the firmly established addictiveness of nicotine, concerns have been raised that e-cigarettes may reverse the population-wide declining trend in nicotine use by addicting new generations of young people.[7,8]

Commented [f1]: OK, just personal preference but I use among instead of amongst as it sounds more modern (see: http://www.dailywritingtips.com/among-vs-amongst/), but it is, of course, up to you.

Many e-cigarette companies have marketed their products with ads that present e-cigarettes as risk-free. Other ads ~~suggest~~ recommend e-cigarettes as a smoking cessation tool.[9,10] These two characterizations are qualitatively distinct, but perceptions of the relative harmlessness of e-cigarettes may reinforce notions that e-cigarettes can be an appropriate smoking cessation treatment. Thus the perception of e-cigarettes as risk free may influence the smoking cessation tools that adolescents who want to quit smoking adopt, encouraging them to use e-cigarettes rather than other smoking cessation tools. This is the focus of the present analysis.

While the FDA has sent warning letters to e-cigarette companies regarding health-related advertising content,[11] the fact remains that currently no nationwide regulations are in place around this product and its advertising. This has given e-cigarette manufacturers a wide berth to mix unproven medical claims in with their marketing. Such efforts to paint a picture of their

product as safe appear to have successfully influenced public opinion among adults and adolescents alike.[10,12,13,13-15]

The health impacts of e-cigarette use are still under investigation. Some studies have focused on the potential for e-cigarettes to play a harm reduction role in relation to conventional cigarettes.[16,17,18] Others have focused on establishing short-term adverse effects, such as nausea, vomiting, headache, or inflammation, or longer term effects such as gene expression alteration and lung cancer.[3,19,20] Still other authors have investigated the device primarily as a smoking cessation tool, experimentally and observationally. Such results have varied markedly.[18,21,22,23,24,25] It remains unclear if e-cigarettes encourage non-smokers to take up smoking, [4,6] if there is no association,[21,26] or whether e-cigarettes assist with cessation.[14,27]

Much remains to be studied, including adolescent perception and use of electronic cigarettes. Some studies have suggested that many teens believe that e-cigarettes are less dangerous than regular cigarettes,[6] with prospective study results suggesting that such beliefs predict e-cigarette use. [14,28-30,31]

On the other hand, results have been mixed regarding whether teen cigarette smokers may be using e-cigarettes for cessation.[6,26] Analysis of the 2011 National Youth Tobacco Survey found that current adolescent cigarette smokers who had experience using e-cigarettes were more likely to intend to quit smoking within 12 months (OR = 1.53; 95% CI, 1.03 – 2.28).[6] Other studies have not consistently found a quantitative association.[5,26] There is some qualitative evidence that young adults use e-cigarettes to quit smoking, with participants citing the behavioral similarity between smoking and e-cigarette use.[17] Teen e-cigarette users have largely emphasized motivations other than smoking cessation, including the relative low risk perception

of e-cigarettes.[30] However, belief about the relative safety of e-cigarettes has not been thoroughly examined in studies investigating teen use of the product for smoking cessation.[5,6,14,29,32,33]

The present analysis ~~will~~ examines the associations between smoking cessation intention, e-cigarette use, and e-cigarette risk perception. We ~~will~~ investigate what role beliefs about the risk and safety of e-cigarettes may play in teen smokers' decisions to use them as a cessation tool. We predicted that both intent to quit and low e-cigarette risk perception ~~will have~~would have significant positive associations with e-cigarette usage, and that the effect of low risk perception ~~will~~ would be more pronounced amongst those teen smokers who intend to quit smoking in the near future.

METHODS

Data Collection and Participants

For this study, we ~~conducted secondary data analysis of~~analyzed data from the 2013 National Youth Tobacco Survey (NYTS). NYTS is conducted by the US Centers for Disease Control and Prevention (CDC) to provide data necessary to inform the development, execution and evaluation of tobacco prevention and control programs.[34,35]

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The survey uses a stratified, 3-stage cluster sample designed to generate a nationally representative cross-sectional sample of U.S. middle school and high school students in public and private schools. The strata ensure adequate representation across categories of urbanicity and racial/ethnic ~~minority~~ group ~~concentration~~. The three stages are primary sampling units (PSUs - approximately county-sized areas), schools within PSUs, and then students within schools. Non-Hispanic black and Hispanic students were oversampled. Excluded from this survey are alternative and special education schools, Department of Defense-operated schools, vocational

schools that serve only pull-out populations, students unable to complete the questionnaire without special assistance, as well as students whose parents did not consent to their participation.[36]

The survey is voluntary at the school level, and schools determine their own active or passive parental consent procedures. This means that some schools required parents to sign and return a permission slip to allow their child to participate (active consent), while others sent home a form parents would only need to return if they wanted to opt their child out of participation (passive consent).

At the student level, the survey is anonymous and voluntary, and is self-administered using pencil and paper. The final sample consisted of 250 schools, 187 of which participated, for a school participation rate of 74.8%. The survey produced 18,406 completed student questionnaires out of a sample of 20,301 students for a student participation rate of 90.7%. The overall participation rate was 67.8%. All human subjects procedures were approved by the CDC Institutional Review Board.[36]

Measures

For the purposes of our inquiry, we restricted all analyses to students who both smoked cigarettes and had heard of electronic cigarettes at the time of survey implementation. The outcome variable was use of electronic cigarettes within the past 30 days. This was determined by the response to the question "In the past 30 days, which of the following products have you used on at least one day?" Students were given a list of nicotine and tobacco products and asked to choose as many as applicable. Those who checked e-cigarettes were classified as having the outcome.

Our exposure of primary interest was belief about whether e-cigarettes are safer than standard cigarettes. Belief about the safety of e-cigarettes was determined by participants' response to a question that asked, "Do you believe any of the following are less harmful than smoking cigarettes?" and instructed the participants that they may choose more than one. Those who selected e-cigarettes were classified as having low risk perception for e-cigarettes.

We also looked at intent to quit smoking "combustible" cigarettes within the next 30 days, testing it as an effect modifier. Intent to quit in the immediate future was determined by dichotomizing the response to the question "Are you seriously thinking about quitting cigarettes?" Those who answered 'Yes, within the next 30 days' were considered as having 30-day intent to quit, and those who answered that they intended to quit within a longer timeframe, or did not intend to quit, were counted as not having 30-day intent to quit. Non-smokers were excluded.

We included age, gender, race/ethnicity and prior intent to quit as covariates. Prior intent to quit was determined by whether the participant had ever, for any length of time, stopped smoking cigarettes with the intention of quitting. Prior intent to quit was controlled for, as it was conceptualized as a probable antecedent of future intent to quit that may also influence e-cigarette use. Race categories included non-Hispanic white, non-Hispanic black, Hispanic, and other/multiple race(s). Age was grouped as 9-12, 13-15, 16-17, and over the age of 18. These demographic variables were included as potential confounders based on theory and previous studies.[3,4,6,15,21,31,37]

Analyses

All analytic and descriptive statistics were confined to students who both smoked and who stated that they had heard of e-cigarettes. We described frequencies of the variables of

interest for the population overall, as well as stratified on e-cigarette use. We used the chi-square test to assess the statistical significance of associations with e-cigarette use.

We used logistic regression to determine the crude association between e-cigarette use and each independent variable. We also ran multivariate logistic regression models to assess the independent associations between perception about e-cigarette safety, future intent to quit, and e-cigarette use, adjusting for covariates. We then ran this multivariate logistic regression model with the addition of an interaction term between 30-day intent to quit and e-cigarette risk perception. Since a significant interaction was identified, we ran the multivariate model stratified on intent to quit smoking.

We also recoded the two primary variables of predictive interest together into one combined four-level categorical variable. The categories were 'has low risk perception and intent to quit,' 'has low risk perception but not intent to quit,' 'has intent to quit but not low risk perception,' and 'has neither.' We ran three separate fully adjusted multivariate logistic regressions, each with a different reference category for the four-level predictor variable. This was done order to establish the relative odds of e-cigarette usage for each combination of indicators, and to attain p values for each possible pairwise comparison.

Statistical significance for main effect was assessed at an alpha of 0.05. Because of reduced statistical power in the assessment of effect modification, we chose 0.1 as our a priori alpha level, as this has been shown to improve the power to detect moderate interactions in some cases.[38] All significance tests were 2-tailed. Statistical analyses were conducted using SAS 9.4 (SAS Institute, Cary, NC). Data were weighted, and the complex sampling method of NYTS was taken into account.

Negative Control Analysis

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Certain characteristics unique to e-cigarettes may give them a relative advantage for being perceived as a smoking cessation tool, such as their ability to be used in concealment,[30] and their behavioral similarity to conventional cigarette smoking.[17] Neither of these characteristics pertain to hookah, another nicotine-containing product that is highly socially acceptable amongst teens and young adults.[13] Since hookah lacks those characteristics, and is also unlike cigarettes in that it is generally consumed in a seated group setting, we would not expect hookah to be used as a smoking cessation tool. Specifically, we would not expect that perceptions of hookah safety would interact with intent to quit smoking, to predict increased hookah use. We duplicated the interaction analysis using hookah-related variables, to probe for the presence of potentially spurious or misinterpreted results within the e-cigarette analysis. The control analysis models also contained the covariates gender, race, age and past attempts to quit smoking.

RESULTS

Description of the sample

E-cigarette users represented 30% of the analytic sample of adolescent smokers. Overall, 37.6% believed that e-cigarettes are safer than smoking conventional cigarettes. One fifth intended to quit smoking within 30 days, and 60.3% had attempted to quit smoking in the past. Almost five percent were between the ages of 9 and 12, 34.5% between 13 and 15, 42.7% age 16 or 17, and 18.1% age 18 or older. About sixty percent were non-Hispanic white, 8.3% non-Hispanic black, 22.5% Hispanic, and 8.4% were another race or multiple races. Males comprised of 55.3% of the analytic sample. Among students who had a low risk perception of e-cigarettes, 36.1% were e-cigarette users, while only 22% of those without such a perception used the

product (p<.001). Intention to quit smoking in the next 30 days was not associated with e-cigarette use, nor were any other variables examined. (Table 1)

Univariate models

In the unadjusted regression models, students who believed e-cigarettes were lower risk than smoking had twice the odds (p<.001) of e-cigarette use of students who did not hold that belief. Future intent to quit smoking was not predictive of e-cigarette use (p=.656), nor were any other variables examined. (Table 2)

Multivariate and interaction models

After controlling for all covariates, e-cigarette risk perception remained predictive of increased e-cigarette use (OR=1.79, p=.003). Future intent to quit smoking had no association with e-cigarette use (OR=1, p=.991). Hispanics ~~race was associated with~~had 1.7 times the odds (p=.034) of e-cigarette use compared to white non-Hispanics ~~race~~. All other covariates were not significant predictors. (Table 2)

The interaction between belief about e-cigarette safety and intent to quit smoking was statistically significant at our a priori alpha level of .01 (p=.056). (Table 2)

Stratified models

Among those with a 30-day intent to quit smoking, students who had a low risk perception of e-cigarettes had 3.84 times higher odds (p=.002) of using e-cigarettes, compared to those without such perception. In that stratum, no other covariates were significant predictors.

Among students without a 30-day intent to quit smoking, those who believed e-cigarettes were safer than smoking had 1.51 times higher odds (p=.059) of using e-cigarettes, but the association was of only borderline significance. Hispanic race was the only significant predictor ~~variable~~ in this model (OR=1.87, p=.013). (Table 3)

We also stratified the data on e-cigarette risk perception to determine whether intent to quit would have a significant effect within either strata. In the low risk perception strata, intent to quit smoking had an odds ratio of 1.5 (p=.27) and in the non low risk perception strata, intent to quit had an odds ratio of 0.70 (p=.25). Neither result was statistically significant. (Data not shown)

Four-category variable model

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Students who had both indicators (intent to quit and low e-cigarette risk perception) had 3.85 times the odds of e-cigarette usage, compared to students who had only intent to quit (p=.0029). Students without intent to quit but who did have low e-cigarette risk perception had 2.23 times the odds of usage (p=.0156), also compared to those with only the intent to quit indicator. Those with neither indicator were not significantly different from those without low risk perception but with 30-day intent to quit (OR=1.49, p=.1651).

With regards to the rotating reference category analysis, we found that those with both indicators were significantly different from those with neither indicator (p=.0095) and from those with only intent to quit (p=.0029), but not significantly different from those only with low risk perception (p=.1853). Those with neither indicator did not, however, significantly different from those with only intent to quit (p=.1651) and were only borderline significantly different from those with only low risk perception (p=.0645). Those with only low risk perception were significantly different from those with only intent to quit (p=.0156).

Negative Control Analysis

In the multivariate negative control analysis without an interaction term, perception of hookah as safer than cigarettes predicted 2.75 times the odds of hookah use (95% CI: 1.99, 3.79, p<.001). Previous attempt to quit smoking was the only other significant covariate in the model,

wherein students who had previously attempted to quit cigarettes had 0.62 times the odds of smoking hookah (95% CI: 0.40, 0.98, p=.04).

The interaction term was also not statistically significant (p=.831). (Data not shown)

Sensitivity Analyses

We ran several sensitivity analyses to test how sensitive our results were to alterations in variable coding and covariate selection. To test if our specification of the intent to quit variable as intent to quit within 30 days was too narrow, we recoded a six-month intent to quit variable and reran the multivariate and interaction analyses. The strengths of the associations varied slightly but the overall results were similar. We also ran our multivariate and interaction models without including the past attempts to quit variable. Results were similar to those of the main analysis.

Our initial inclusion criteria were that the student had to have indicated that they had heard of e-cigarettes on a 'check all that apply' question. However, if a student accidentally skipped over this question, they would be falsely misclassified as not having heard of e-cigarettes, even if they answered affirmatively to subsequent 'check all that apply' e-cigarette questions. We ran three sensitivity analyses that broadened the inclusion criteria beyond students who checked that they had heard of e-cigarettes in three different ways (analytic N=948)– 1) by including students who checked that they currently use e-cigarettes but did not indicate that they had heard of e-cigarettes (analytic N=988), 2) by including students who checked that they currently used e-cigarettes, and students who checked that they believed e-cigarettes to be safer, but did not check that they had heard of e-cigarettes (analytic N=1063), and 3) by including students who checked that they believed e-cigarettes to be safer, but did not check that they had heard of e-cigarettes (analytic N=1033).

In the first sensitivity analysis, the interaction model and stratified model results were comparable, except that in the non intent-to-quit strata, harm perception was not a borderline significant predictor of e-cigarette use (OR=1.3, p=.14). In both the interaction term and stratified models of the second sensitivity analyses, all terms of interest (belief, intent to quit, interaction term) were not statistically significant predictors of e-cigarette use. In the third sensitivity analysis interaction model, the terms of interest were not statistically significant. We stratified, regardless of the non-significant p-value of the interaction term, and found that in the intent-to-quit strata, low e-cigarette harm perception predicted usage (OR=2.5, p=.02). The other strata did not have significant results.

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DISCUSSION

We found that low harm perception of e-cigarettes predicted nearly four times the e-cigarette use amongst teen smokers who intended to quit within the next 30 days, compared to those without such perception. This association was not seen amongst teen smokers who did not intend to quit, and was also not duplicated in the negative control analysis with hookah. We believe our study to be the first to look at an interaction between e-cigarette harm perception and intent to quit amongst teen smokers, and the first to employ a negative control model to lend support for understanding the role of e-cigarettes in adolescent smoking cessation practices.

While many studies have looked at e-cigarettes and smoking cessation and reduction among adults,[17,18,21,27,32,39-41] and other studies have looked at e-cigarette usage and perceptions amongst teens and young adults,[4,6,7,13,15,29,30,42-44] few studies have looked at adolescent smoking cessation and e-cigarettes.[5,26,45] We were able to identify very few quantitative studies that examined e-cigarette harm perceptions within the question of smoking cessation, and their results supported our finding that a lower harm perception predicts use for smoking cesation.[29]

Our ~~unique~~ finding ~~is~~ that the relationship between e-cigarette harm perception and e-cigarette use is stronger amongst teens who wish to quit smoking~~,~~ suggest~~s~~~~ing~~ that intent to quit may be an underlying factor in the decision to use e-cigarettes for some adolescents.[6] Amongst teens who did not intend to quit, on the other hand, risk perception had a weak borderline statistically significant effect. Of note is the fact that future intent to quit had no independent main effect on e-cigarette usage, and does not reach statistical significance when stratified on harm perception, but was significant as an effect modifier for the harm perception variable. This may explain why some previous studies that tested intent to quit as a predictor of e-cigarette usage among adolescents found no association, since they looked at this variable as an exposure only and not in the context of an interaction.[26]

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Interestingly, when we created the four-level categorical variable that included both the effect modifier and the exposure, we found that those with intent to quit but not e-cigarette low risk perception actually had an odds ratio point estimate that was even lower than those with neither indicator (OR=1 and OR=1.49, respectively). However, this difference was not statistically significant, which may have been a sample size issue. Additionally, those with both indicators had the highest point estimate of the relative odds (OR=3.85), and were higher than those with only low risk perception but not intent to quit (OR=2.23). This difference, however, was also not statistically significant (p=.1853). If these two differences had reached statistical significance, it would have suggested that intent to quit smoking may be protective against e-cigarette usage in the absence of low e-cigarette risk perception, but elevates the likelihood of e-cigarette usage when combined with low e-cigarette risk perception.

Several important limitations of this analysis must be considered. All measures were based on self-report, and social desirability bias is plausible. However, prior work suggests that

anonymous in-school surveys are a method to measure tobacco use accurately, compared to other survey implementation methods.[46] Given that NYTS is a cross-sectional survey, temporal order cannot be established, though the variables we chose do contain self-reported temporal components. Some concerns may exist about generalizability, given that the overall participation rate of NYTS was under 70% and that schools used different parental consent procedures. Because of reduced analytic sample size, we chose a priori to increase our interaction alpha level to 0.1, a decision which may have increased the risk of a type I error.

Another limitation is the fact that when we stratified by harm perception, we did not obtain significant results for the effect of intent to quit and in the four-level variable analysis, pairwise comparisons between variable levels that differed only by intent to quit were not significantly different. It is possible that the analysis was underpowered due to small sample size.

Another limitation to consider is that our sensitivity analyses for our inclusion criteria did not yield results consistent with our main analysis. While this is a finding to acknowledge, we are not highly concerned that our results were found spuriously due to selection criteria or problematic variable coding, since the data suggests that the widening of the inclusion criteria introduced only random error. A small proportion of respondents marked inconsistent and conflicting responses across the questions on e-cigarette usage, familiarity with e-cigarettes, and e-cigarette risk perception, and it is impossible to know what their true responses should have been. Therefore, we are confident in our decision to only include students who marked that they had heard of e-cigarettes. Another similar study also used the same criteria for determining a valid response to the question of harm perception.[42]

The fact that we ran the same analyses using hookah rather than e-cigarettes and found no interaction between hookah safety perception and intent to quit smoking cigarettes supports

hypotheses about the particular characteristics of e-cigarettes that may position them to be adopted and perceived as a smoking cessation tool. E-cigarettes, unlike other nicotine replacement therapies, more closely address the behavioral component of cigarette addiction, something that has been noted in qualitative research with adults who have quit smoking with the assistance of e-cigarettes.[17] While hookah smoking mimics the same bodily motions, it is less similar and generally is not used with the same frequency. Teen e-cigarette users have cited the fact that e-cigarettes can be consumed expeditiously, in concealment, without odor, and in many different places as reasons why they use them.[30] The same cannot be said for hookah. Our pattern of evidence, in combination with past research, provides strong support that a subgroup of teen smokers who believe e-cigarettes are safer than cigarettes are in fact using them with an intention to quit smoking.

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It is unsurprising that many teens would believe e-cigarettes are less harmful than conventional cigarettes. Reviews of advertising content have found that marketers portray them as a "guilt-free" alternative to smoking[47] and that advertising content in YouTube videos makes health and safety claims that may in fact be prohibited by the FDA.[48]

It is possible that e-cigarettes are of relatively lower harm than cigarettes, but evidence is not conclusive. The devices are not regulated and therefore may be inconsistent in their dosing and ingredients, and randomized control trials have found safety concerns.[45] It is also unknown if e-cigarettes actually assist with smoking cessation. While we know that adults are using them with the intention of smoking cessation, no randomized controlled trial has shown them to be effective for such use, and some studies have suggested that their use results in reduced likelihood of smoking cessation, and instead predicts dual use with conventional cigarettes.[39,49]

Additionally, e-cigarettes may displace effective smoking cessation programs,[47] which is of particular concern given that there are effect smoking cessation programs for adolescents.[33] More research on the relative and absolute safety of e-cigarettes and on their utility for smoking cessation is needed. Until definitive safety and smoking cessation information is available, it is important that adolescents and adults are made aware of the current state of the scientific evidence, so that they do not base health-motivated decisions on potentially inaccurate claims perpetuated by advertising or word of mouth.

Our research shows that a subset of adolescent smokers who wish to quit smoking conventional cigarettes, characterized by perceptions of low e-cigarette harmfulness, have a particularly raised odds of smoking e-cigarettes. Plainly, teens who wish to quit smoking and who believe e-cigarettes are safer than cigarettes may in fact be using e-cigarettes as a smoking cessation tool. Although no current federal regulations on e-cigarettes exist, some states have prohibited sale to minors.[9,50] The FDA is deliberating about changing the category under which e-cigarettes are classified, to allow FDA to regulate the product, while also allowing for the continuation of health research to explore product safety, and utility for smoking cessation.[50] Some researchers and health advocates are hopeful that this product may indeed be the smoking cessation tool that will make an unprecedented difference, particularly given its bio-behavioral similarity to combustible cigarettes.[17] However, as of yet, the evidence is neither plentiful nor clear.[18] In the absence of definitive safety data, regulations should be put in place that will prevent minors from procuring this product and will regulate advertising content and methods, to prevent the dissemination of unfounded health claims and marketing directed towards youth.[40,42,51]

TABLE 1—Descriptive statistics of youth who smoke cigarettes and have heard of e-cigarettes overall and by e-cigarette use: 2013 National Youth Tobacco Survey

	Total		Past 30-Day E-Cigarette Use				
			Yes		No		
	Unweighted N	Weighted %	Unweighted N	Weighted %	Unweighted N	Weighted %	P[A]
Total	1032		309	30.0	723	70.0	
Believes e-cigarettes safer than conventional cigarettes							<.001
Yes	435	37.6	152	36.1	283	63.9	
No	742	62.4	171	22.0	571	78.0	
Future 30-day intent to quit smoking cigarettes							.655
Yes	201	19.7	51	28.2	150	71.8	
No	831	80.3	258	30.4	573	69.6	
Ever tried to quit smoking cigarettes							.120
Yes	624	60.3	174	27.9	450	72.1	
No	364	39.7	125	33.4	239	66.6	
Age							.201
9-12	62	4.7	11	16.2	51	83.8	
13-15	415	34.5	104	24.5	311	75.5	
16-17	481	42.7	140	28.8	341	71.2	
18+	215	18.1	67	32.0	148	68.0	
Race/Ethnicity							.246
Non-Hispanic white	621	60.8	164	25.5	457	74.5	
Non-Hispanic black	117	8.3	27	24.7	90	75.3	
Hispanic	302	22.5	88	30.1	214	69.9	
Other or multiple	123	8.4	41	35.8	82	64.2	
Gender							.113
Male	630	55.3	188	29.5	442	70.5	
Female	546	44.7	135	24.7	411	75.3	

[A]Chi squared p-value

TABLE 2—Unadjusted and adjusted logistic regression models predicting e-cigarette use amongst smokers who have heard of e-cigarettes: 2013 National Youth Tobacco Survey

Variable	Univariate Models				Multivariate Model N=948			Interaction Model N=948
	N Model	OR	95% CI	P[A]	OR	95% CI	P[A]	
Believes e-cigarettes safer than smoking	1177							
Yes		2.00	(1.41, 2.85)	<.001	1.79	(1.23, 2.62)	.003	
No		1	-	-	1	-	-	
Future 30-day intent to quit smoking cigarettes	1032							
Yes		0.90	(0.55, 1.45)	.656	1.00	(0.63, 1.59)	.991	
No		1	-	-	1	-	-	
Ever tried to quit smoking cigarettes	988							
Yes		0.77	(0.55, 1.07)	.120	0.81	(0.58, 1.13)	.219	
No		1	-	-	1	-	-	
Age	1173							
9-12		0.41	(0.17, 1.00)	.050	0.68	(0.20, 2.30)	.539	
13-15		0.69	(0.44, 1.08)	.105	0.98	(0.61, 1.57)	.932	
16-17		0.86	(0.55, 1.35)	.509	1.02	(0.61, 1.71)	.935	
18+		1	-	-	1	-	-	
Race/Ethnicity	1163							
Non-Hispanic white		1	-	-	1	-	-	
Non-Hispanic black		0.96	(0.50, 1.82)	.892	1.37	(0.69, 2.72)	.374	
Hispanic		1.25	(0.90, 1.75)	.186	1.70	(1.04, 2.79)	.034	
Other or multiple		1.62	(0.93, 2.84)	.089	1.42	(0.81, 2.50)	.225	
Gender	1176							
Male		1.28	(0.94, 1.72)	.114	1.24	(0.85, 1.82)	.262	
Female		1	-	-	1	-	-	
Interaction Term: Belief * Intent to Quit								.056

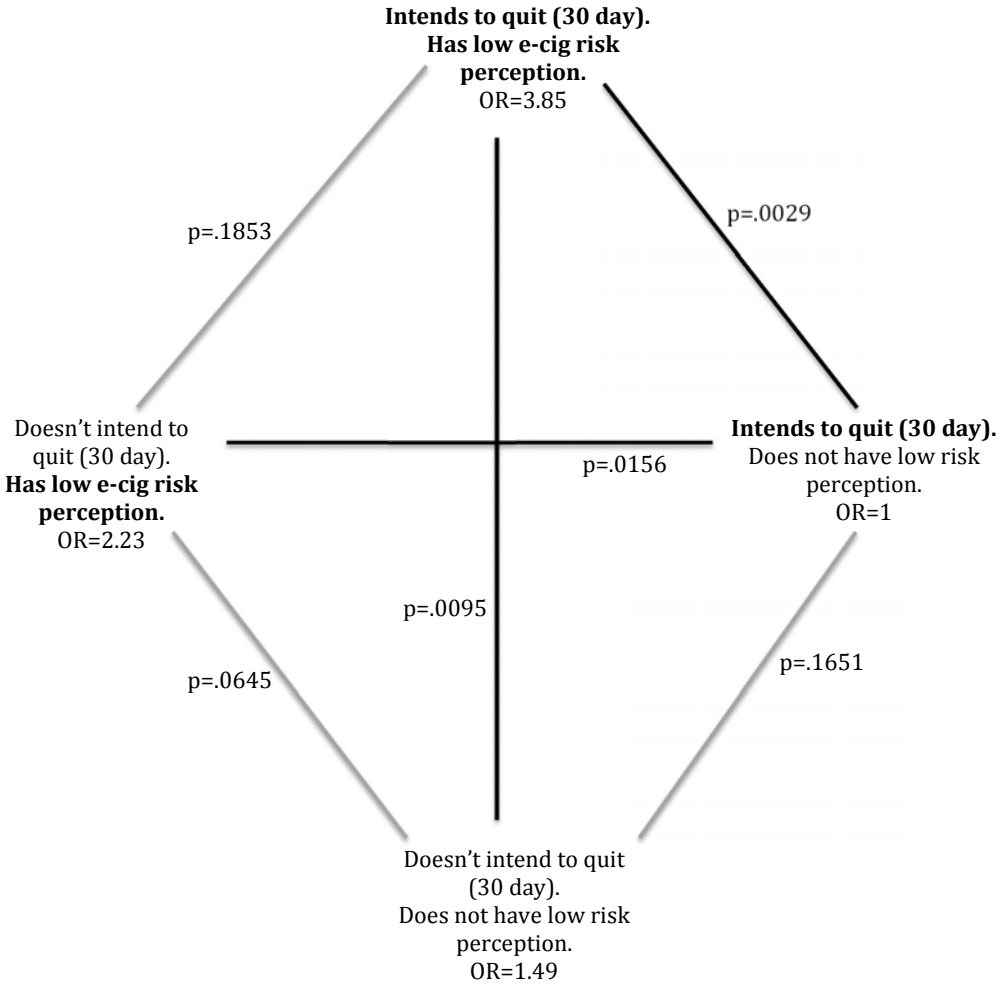
[A]Chi-squared p-value

TABLE 3—Logistic regression models predicting e-cigarette use among teen smokers who have heard of e-cigarettes, stratified by 30-day intent to quit: 2013 National Youth Tobacco Survey

	30-Day Intent to Quit Cigarettes					
	Yes[B] N=207			No[C] N=867		
	OR	95% CI	P[A]	OR	95% CI	P[A]
Believes e-cigarettes safer than conventional cigarettes						
Yes	3.84	(1.66, 8.90)	.002	1.51	(0.99, 2.31)	.059
No	1	-	-	1	-	-
Ever tried to quit smoking cigarettes						
Yes	0.67	(0.20, 2.23)	.516	0.81	(0.58, 1.13)	.208
No	1	-	-	1	-	-
Age						
9-12	0.11	(0.01, 1.51)	.098	1.03	(0.37, 2.91)	.949
13-15	0.90	(0.30, 2.72)	.848	1.00	(0.64, 1.58)	.994
16-17	0.55	(0.16, 1.90)	.342	1.17	(0.70, 1.96)	.553
18+	1	-	-	1	-	-
Race/Ethnicity						
Non-Hispanic white	1	-	-	-	-	-
Non-Hispanic black	1.51	(0.36, 6.35)	.573	1.34	(0.73, 2.46)	.341
Hispanic	1.14	(0.28, 4.63)	.859	1.87	(1.14, 3.05)	.013
Other or multiple	1.14	(0.31, 4.20)	.849	1.56	(0.84, 2.91)	.158
Gender						
Male	1.78	(0.74, 4.29)	.198	1.13	(0.78, 1.64)	.520
Female	1	-	-	1	-	-

[A]Chi-squared p-value

Figure 1. Relative odds of e-cigarette usage among adolescent smokers who have heard of e-cigarettes, predicted by four-level categorical variable, with p-values for all pairwise comparisons



N Model = 948
Model is adjusted for past quit attempts, age, race/ethnicity and gender.
All p values in figure are chi square p values.
Black lines represent differences significant at the .05 level.
Grey lines represent differences that are not significant at the .05 level, but may be borderline statistically significant.

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Appendix: Syntax

```
*EPI752 Lila Starbuck
NYTS 2013 Dataset
4/25/15;

LIBNAME NYTS1 'C:\Users\NAME REDACTED\Documents\E-Cigs NYTS\NYTS Code and
Work data\Dataset';

*************************************************************************
***************
*********************************NYTS 2013 FORMAT
CODES*********************************;

options nocenter ls=120 ps=63 nofmterr;

run;
proc format ;

value QN1F
1 = "9 years old"
2 = "10 years old"
3 = "11 years old"
4 = "12 years old"
5 = "13 years old"
6 = "14 years old"
7 = "15 years old"
8 = "16 years old"
9 = "17 years old"
10 = "18 years old"
11 = "19 years old or older"
. = "<Missing>"
;
value QN2F
1 = "Male"
2 = "Female"
. = "<Missing>"
;
value QN3F
1 = "6th"
2 = "7th"
3 = "8th"
4 = "9th"
5 = "10th"
6 = "11th"
7 = "12th"
8 = "Ungraded or other grade"
. = "<Missing>"
;
value QN4AF
1 = "No, not of Hispanic, Latino, Latina, or Spanish origin"
. = "<Missing>"
;
value QN4BF
1 = "Mexican, Mexican American, Chicano or Chicana"
. = "<Missing>"
```

```
;
value QN4CF
1 = "Puerto Rican"
. = "<Missing>"
;
value QN4DF
1 = "Cuban"
. = "<Missing>"
;
value QN4EF
1 = "Another Hispanic, Latino/a or Spanish origin"
. = "<Missing>"
;
value QN5AF
1 = " American Indian or Alaska Native"
. = "<Missing>"
;
value QN5BF
1 = " Asian"
. = "<Missing>"
;
value QN5CF
1 = " Black or African American"
. = "<Missing>"
;
value QN5DF
1 = " Native Hawaiian or Other Pacific Islander"
. = "<Missing>"
;
value QN5EF
1 = " White"
. = "<Missing>"
;
value QN6F
1 = "Definitely yes"
2 = "Probably yes"
3 = "Probably not"
4 = "Definitely not"
. = "<Missing>"
;
value QN7F
1 = "Definitely yes"
2 = "Probably yes"
3 = "Probably not"
4 = "Definitely not"
. = "<Missing>"
;
value QN8F
1 = "Definitely yes"
2 = "Probably yes"
3 = "Probably not"
4 = "Definitely not"
. = "<Missing>"
;
value QN9F
1 = "Yes"
2 = "No"
```

```
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN10F
1 = "Definitely yes"
2 = "Probably yes"
3 = "Probably not"
4 = "Definitely not"
. = "<Missing>"
;
value QN11F
1 = "Definitely yes"
2 = "Probably yes"
3 = "Probably not"
4 = "Definitely not"
. = "<Missing>"
;
value QN12F
1 = "Definitely yes"
2 = "Probably yes"
3 = "Probably not"
4 = "Definitely not"
. = "<Missing>"
;
value QN13F
1 = "I have never smoked cigarettes, not even one or two puffs"
2 = "8 years old or younger"
3 = "9 years old"
4 = "10 years old"
5 = "11 years old"
6 = "12 years old"
7 = "13 years old"
8 = "14 years old"
9 = "15 years old"
10 = "16 years old"
11 = "17 years old"
12 = "18 years old"
13 = "19 years old or older"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN14F
1 = "I have never smoked cigarettes, not even one or two puffs"
2 = "1 or more puffs but never a whole cigarette"
3 = "1 cigarette"
4 = "2 to 5 cigarettes"
5 = "6 to 15 cigarettes (about 1/2 a pack total)"
6 = "16 to 25 cigarettes (about 1 pack total)"
7 = "26 to 99 cigarettes (more than 1 pack, but less than 5 packs)"
8 = "100 or more cigarettes (5 or more packs)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN15F
1 = "0 days"
2 = "1 or 2 days"
3 = "3 to 5 days"
```

```
4 = "6 to 9 days"
5 = "10 to 19 days"
6 = "20 to 29 days"
7 = "All 30 days"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN16F
1 = "I did not smoke cigarettes during the past 30 days"
2 = "Less than 1 cigarette per day"
3 = "1 cigarette per day"
4 = "2 to 5 cigarettes per day"
5 = "6 to 10 cigarettes per day"
6 = "11 to 20 cigarettes per day"
7 = "More than 20 cigarettes per day"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN17F
1 = "I have never smoked cigarettes, not even one or two puffs"
2 = "Earlier today"
3 = "Not today but sometime during the past 7 days"
4 = "Not during the past 7 days but sometime during the past 30 days"
5 = "Not during the past 30 days but sometime during the past 6 months"
6 = "Not during the past 6 months but sometime during the past year"
7 = "1 to 4 years ago"
8 = "5 or more years ago"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN18F
1 = "I did not smoke cigarettes during the past 30 days"
2 = "I did not smoke a usual brand"
3 = "American Spirit"
4 = "Camel"
5 = "GPC, Basic, or Doral"
6 = "Kool"
7 = "Lucky Strike"
8 = "Marlboro"
9 = "Newport"
10 = "Parliament"
11 = "Virginia Slims"
12 = "Some other brand not listed here"
13 = "Not sure"
. = "<Missing>"
;
value QN19F
1 = "I did not smoke cigarettes during the past 30 days"
2 = "Yes"
3 = "No"
4 = "Not sure"
. = "<Missing>"
;
value QN20AF
1 = "I did not get cigarettes during the past 30 days"
. = "<Missing>"
;
```

```
value QN20BF
1 = "I bought a pack of cigarettes myself"
. = "<Missing>"
;
value QN20CF
1 = "I had someone else buy a pack of cigarettes for me"
. = "<Missing>"
;
value QN20DF
1 = "I asked someone to give me a cigarette"
. = "<Missing>"
;
value QN20EF
1 = "Someone offered me a cigarette"
. = "<Missing>"
;
value QN20FF
1 = "I bought cigarettes from another person"
. = "<Missing>"
;
value QN20GF
1 = "I took cigarettes from a store or another person"
. = "<Missing>"
;
value QN20HF
1 = "I got cigarettes some other way"
. = "<Missing>"
;
value QN21AF
1 = "I did not buy cigarettes during the past 30 days"
. = "<Missing>"
;
value QN21BF
1 = "A gas station or convenience store"
. = "<Missing>"
;
value QN21CF
1 = "A grocery store"
. = "<Missing>"
;
value QN21DF
1 = "A drugstore"
. = "<Missing>"
;
value QN21EF
1 = "A vending machine"
. = "<Missing>"
;
value QN21FF
1 = "Over the Internet"
. = "<Missing>"
;
value QN21GF
1 = "Through the mail"
. = "<Missing>"
;
value QN21HF
```

```
1 = "Some other place not listed here"
. = "<Missing>"
;
value QN22F
1 = "I did not try to buy cigarettes during the past 30 days"
2 = "Yes"
3 = "No"
. = "<Missing>"
;
value QN23F
1 = "Yes"
2 = "No"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN24F
1 = "I have never smoked cigars, cigarillos, or little cigars, not even one
or two puffs"
2 = "8 years old or younger"
3 = "9 years old"
4 = "10 years old"
5 = "11 years old"
6 = "12 years old"
7 = "13 years old"
8 = "14 years old"
9 = "15 years old"
10 = "16 years old"
11 = "17 years old"
12 = "18 years old"
13 = "19 years old or older"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN25F
1 = "0 days"
2 = "1 or 2 days"
3 = "3 to 5 days"
4 = "6 to 9 days"
5 = "10 to 19 days"
6 = "20 to 29 days"
7 = "All 30 days"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN26AF
1 = "I did not get cigars, cigarillos, or little cigars during the past 30
days"
. = "<Missing>"
;
value QN26BF
1 = "I bought them myself"
. = "<Missing>"
;
value QN26CF
1 = "I had someone else buy them for me"
. = "<Missing>"
;
```

```
value QN26DF
1 = "I asked someone to give me one"
. = "<Missing>"
;
value QN26EF
1 = "Someone offered it to me"
. = "<Missing>"
;
value QN26FF
1 = "I bought them from another person"
. = "<Missing>"
;
value QN26GF
1 = "I took them from a store or another person"
. = "<Missing>"
;
value QN26HF
1 = "I got them some other way"
. = "<Missing>"
;
value QN27AF
1 = "I did not buy cigars, cigarillos, or little cigars during the past 30
days"
. = "<Missing>"
;
value QN27BF
1 = "A gas station or convenience store"
. = "<Missing>"
;
value QN27CF
1 = "A grocery store"
. = "<Missing>"
;
value QN27DF
1 = "A drugstore"
. = "<Missing>"
;
value QN27EF
1 = "A vending machine"
. = "<Missing>"
;
value QN27FF
1 = "Over the Internet"
. = "<Missing>"
;
value QN27GF
1 = "Through the mail"
. = "<Missing>"
;
value QN27HF
1 = "Some other place not listed here"
. = "<Missing>"
;
value QN28F
1 = "Yes"
2 = "No"
. = "<Missing>"
```

```
.e = "<Inconsistent>"
;
value QN29F
1 = "I have never used chewing tobacco, snuff, or dip"
2 = "8 years old or younger"
3 = "9 years old"
4 = "10 years old"
5 = "11 years old"
6 = "12 years old"
7 = "13 years old"
8 = "14 years old"
9 = "15 years old"
10 = "16 years old"
11 = "17 years old"
12 = "18 years old"
13 = "19 years old or older"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN30F
1 = "0 days"
2 = "1 or 2 days"
3 = "3 to 5 days"
4 = "6 to 9 days"
5 = "10 to 19 days"
6 = "20 to 29 days"
7 = "All 30 days"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN31AF
1 = "I did not get chewing tobacco, snuff, or dip during the past 30 days"
. = "<Missing>"
;
value QN31BF
1 = "I bought it myself"
. = "<Missing>"
;
value QN31CF
1 = "I had someone else buy it for me"
. = "<Missing>"
;
value QN31DF
1 = "I asked someone to give me some"
. = "<Missing>"
;
value QN31EF
1 = "Someone offered it to me"
. = "<Missing>"
;
value QN31FF
1 = "I bought it from another person"
. = "<Missing>"
;
value QN31GF
1 = "I took it from a store or another person"
. = "<Missing>"
```

```
;
value QN31HF
1 = "I got it some other way"
. = "<Missing>"
;
value QN32AF
1 = "I did not buy chewing tobacco, snuff, or dip during the past 30 days"
. = "<Missing>"
;
value QN32BF
1 = "A gas station or convenience store"
. = "<Missing>"
;
value QN32CF
1 = "A grocery store"
. = "<Missing>"
;
value QN32DF
1 = "A drugstore"
. = "<Missing>"
;
value QN32EF
1 = "A vending machine"
. = "<Missing>"
;
value QN32FF
1 = "Over the Internet"
. = "<Missing>"
;
value QN32GF
1 = "Through the mail"
. = "<Missing>"
;
value QN32HF
1 = "Some other place not listed here"
. = "<Missing>"
;
value QN33F
1 = "Yes"
2 = "No"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN34F
1 = "0 days"
2 = "1 or 2 days"
3 = "3 to 5 days"
4 = "6 to 9 days"
5 = "10 to 19 days"
6 = "20 to 29 days"
7 = "All 30 days"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35AF
1 = "Roll-your-own cigarettes"
. = "<Missing>"
```

```
.e = "<Inconsistent>"
;
value QN35BF
1 = "Flavored cigarettes, such as Camel Crush"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35CF
1 = "Bidis (small brown cigarettes wrapped in a leaf)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35DF
1 = "Clove cigars (kreteks)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35EF
1 = "Flavored little cigars (such as mint, clove, spice, alcohol (wine,
cognac), candy, fruit, chocolate, or other sweets)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35FF
1 = "Smoking tobacco from a hookah or a waterpipe"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35GF
1 = "Snus, such as Camel or Marlboro Snus"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35HF
1="Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs, Camel
sticks, or Camel strips"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35IF
1 = "Electronic Cigarettes or E-cigarettes, such as Ruyan or NJOY"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35JF
1 = "Some other new tobacco product not listed here"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN35KF
1 = "I have never heard of any of the products listed above or any new
tobacco product "
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36AF
1 = "Roll-your-own cigarettes"
```

```
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36BF
1 = "Flavored cigarettes, such as Camel Crush"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36CF
1 = "Bidis (small brown cigarettes wrapped in a leaf)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36DF
1 = "Clove cigars (kreteks)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36EF
1 = "Flavored little cigars (such as mint, clove, spice, alcohol (wine,
cognac), candy, fruit, chocolate, or other sweets)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36FF
1 = "Smoking tobacco from a hookah or a waterpipe"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36GF
1 = "Snus, such as Camel or Marlboro Snus"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36HF
1= "Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs, Camel
sticks, or Camel strips"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36IF
1 = "Electronic Cigarettes or E-cigarettes, such as Ruyan or NJOY"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36JF
1 = "Some other new tobacco product not listed here"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN36KF
1 = "I have never tried any of the products listed above or any new tobacco
product"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37AF
```

```
1 = "Roll-your-own cigarettes"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37BF
1 = "Flavored cigarettes, such as Camel Crush"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37CF
1 = "Bidis (small brown cigarettes wrapped in a leaf)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37DF
1 = "Clove cigars (kreteks)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37EF
1 = "Flavored little cigars (such as mint, clove, spice, alcohol (wine,
cognac), candy, fruit, chocolate, or other sweets)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37FF
1 = "Smoking tobacco from a hookah or a waterpipe"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37GF
1 = "Snus, such as Camel or Marlboro Snus"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37HF
1 = "Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs,
Camel sticks, or Camel strips"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37IF
1 = "Electronic Cigarettes or E-cigarettes, such as Ruyan or NJOY"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37JF
1 = "Some other new tobacco product not listed here"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN37KF
1 = "I have not used any of the products listed above or any new tobacco
product in the past 30 days"
. = "<Missing>"
.e = "<Inconsistent>"
;
```

```
value QN38F
1 = "Very easy"
2 = "Somewhat easy"
3 = "Not easy at all"
. = "<Missing>"
;
value QN39F
1 = "Yes"
2 = "No"
. = "<Missing>"
;
value QN40F
1 = "I do not use the Internet"
2 = "Never"
3 = "Rarely"
4 = "Sometimes"
5 = "Most of the time"
6 = "Always"
. = "<Missing>"
;
value QN41F
1 = "I do not read newspapers or magazines"
2 = "Never"
3 = "Rarely"
4 = "Sometimes"
5 = "Most of the time"
6 = "Always"
. = "<Missing>"
;
value QN42AF
1 = "The mail"
. = "<Missing>"
;
value QN42BF
1 = "E-mail"
. = "<Missing>"
;
value QN42CF
1 = "The Internet"
. = "<Missing>"
;
value QN42DF
1 = "Social Networks (such as Facebook and Twitter)"
. = "<Missing>"
;
value QN42EF
1 = "A text message"
. = "<Missing>"
;
value QN42FF
1 = "On a cigarette pack or other tobacco product"
. = "<Missing>"
;
value QN42GF
1 = "I did not receive coupons from a tobacco company"
. = "<Missing>"
;
```

```
value QN43F
1 = "I never go to a convenience store, supermarket, or gas station"
2 = "Never "
3 = "Rarely"
4 = "Sometimes"
5 = "Most of the time"
6 = "Always"
. = "<Missing>"
;
value QN44F
1 = "I did not see an ad for cigarettes or other tobacco products during the
past 30 days"
2 = "Never "
3 = "Rarely"
4 = "Sometimes"
5 = "Most of the time"
6 = "Always"
. = "<Missing>"
;
value QN45F
1 = "I do not watch TV or go to the movies"
2 = "Never "
3 = "Rarely"
4 = "Sometimes"
5 = "Most of the time"
6 = "Always"
. = "<Missing>"
;
value QN46AF
1 = "American Spirit"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN46BF
1 = "Camel"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN46CF
1 = "GPC, Basic, or Doral"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN46DF
1 = "Kool"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN46EF
1 = "Marlboro"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN46FF
1 = "Newport"
. = "<Missing>"
.e = "<Inconsistent>"
```

```
;
value QN46GF
1 = "Some other brand not listed here"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN46HF
1 = "I don't have a favorite cigarette brand"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN46IF
1 = "Not sure"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47AF
1 = "A man who lost his legs from amputations (removal of body parts)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47BF
1 = "A woman who lost her fingers and toes from amputations (removal of body
parts)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47CF
1 = "A man with a scar on his chest from a heart attack"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47DF
1 = "A woman putting on a wig and putting in her teeth while getting dressed"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47EF
1 = "A son bathing and caring for his mother on her bed because she had a
stroke"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47FF
1 = "A mom giving her son an inhaler because he has breathing problems from
being around adults who smoke cigarettes"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47GF
1 = "A man in the shower covering the hole in his neck"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47HF
1 = "A child scratching because of chicken pox"
. = "<Missing>"
```

```
.e = "<Inconsistent>"
;
value QN47IF
1 = "Don't know/Not sure"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN47JF
1 = "I haven't seen or heard any of these advertisements"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN48F
1 = "I do not use tobacco"
2 = "Within 5 minutes"
3 = "From 6 to 30 minutes"
4 = "From more than 30 minutes to 1 hour"
5 = "After more than 1 hour but less than 24 hours"
6 = "I rarely want to use tobacco"
. = "<Missing>"
;
value QN49F
1 = "Yes"
2 = "No"
. = "<Missing>"
;
value QN50F
1 = "Very likely"
2 = "Somewhat likely"
3 = "Somewhat unlikely"
4 = "Very unlikely"
. = "<Missing>"
;
value QN51F
1 = "I did not see a doctor, dentist, or nurse during the past 12 months"
2 = "Yes"
3 = "No"
. = "<Missing>"
;
value QN52F
1 = "I did not see a doctor, dentist, or nurse during the past 12 months"
2 = "Yes"
3 = "No"
. = "<Missing>"
;
value QN53F
1 = "I do not smoke cigarettes"
2 = "Yes, within the next 30 days "
3 = "Yes, within the next 6 months"
4 = "Yes, within the next 12 months"
5 = "Yes, but not within the next 12 months"
6 = "No, I am not thinking about quitting cigarettes"
. = "<Missing>"
;
value QN54F
1 = "I did not smoke during the past 12 months"
2 = "I did not try to quit during the past 12 months"
```

```
3 = "1 time"
4 = "2 times"
5 = "3 to 5 times"
6 = "6 to 9 times"
7 = "10 or more times"
. = "<Missing>"
;
value QN55F
1 = "I have never smoked cigarettes"
2 = "I have never tried to quit"
3 = "Less than a day"
4 = "1 to 7 days"
5 = "More than 7 days but less than 30 days"
6 = "More than 30 days but less than 6 months"
7 = "More than 6 months but less than 1 year"
8 = "1 year or more"
. = "<Missing>"
;
value QN56F
1 = "I do not use tobacco products"
2 = "Yes, within the next 30 days"
3 = "Yes, within the next 6 months"
4 = "Yes, within the year"
5 = "Yes, but not within the year"
6 = "No, I am not thinking about quitting the use of all tobacco products"
. = "<Missing>"
;
value QN57F
1 = "I did use tobacco products during the past 12 months"
2 = "I did not try to quit all tobacco products during the past 12 months"
3 = "1 time"
4 = "2 times"
5 = "3 to 5 times"
6 = "6 to 9 times"
7 = "10 or more times"
. = "<Missing>"
;
value QN58AF
1 = "I did not use tobacco of any kind during the past 12 months"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58BF
1 = "I did not try to quit during the past 12 months"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58CF
1 = "Attended a program in my school"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58DF
1 = "Attended a program in the community"
. = "<Missing>"
.e = "<Inconsistent>"
;
```

```
value QN58EF
1 = "Called a telephone help line or telephone quit line"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58FF
1 = "Used nicotine gum"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58GF
1 = "Used nicotine patch"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58HF
1 = "Used any medicine to help quit"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58IF
1 = "Visited an Internet quit site"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58JF
1 = "Got help from family or friends"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58KF
1 = "Used another method, such as hypnosis or acupuncture"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN58LF
1 = "Tried to quit on my own or quit 'cold turkey'"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN59F
1 = "0 days"
2 = "1 day"
3 = "2 days"
4 = "3 days"
5 = "4 days"
6 = "5 days"
7 = "6 days"
8 = "7 days"
. = "<Missing>"
;
value QN60F
1 = "0 days"
2 = "1 day"
3 = "2 days"
4 = "3 days"
5 = "4 days"
```

```
6 = "5 days"
7 = "6 days"
8 = "7 days"
. = "<Missing>"
;
value QN61F
1 = "0 days"
2 = "1 day"
3 = "2 days"
4 = "3 days"
5 = "4 days"
6 = "5 days"
7 = "6 days"
8 = "7 days"
. = "<Missing>"
;
value QN62F
1 = "I do not have a job"
2 = "I did not work during the past 7 days"
3 = "0 days"
4 = "1 days"
5 = "2 days"
6 = "3 days"
7 = "4 days"
8 = "5 days"
9 = "6 days"
10 = "7 days"
. = "<Missing>"
;
value QN63F
1 = "0 days"
2 = "1 day"
3 = "2 days"
4 = "3 days"
5 = "4 days"
6 = "5 days"
7 = "6 days"
8 = "7 days"
. = "<Missing>"
;
value QN64F
1 = "Always allowed"
2 = "Allowed only at some times or in some places"
3 = "Never allowed"
. = "<Missing>"
;
value QN65F
1 = "Always allowed"
2 = "Sometimes allowed"
3 = "Never allowed"
. = "<Missing>"
;
value QN66AF
1 = "Smoke cigarettes"
. = "<Missing>"
.e = "<Inconsistent>"
;
```

```
value QN66BF
1 = "Use chewing tobacco, snuff, or dip"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN66CF
1 = "Use snus"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN66DF
1 = "Smoke cigars, cigarillos, or little cigars"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN66EF
1 = "Smoke tobacco using a hookah or waterpipe"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN66FF
1 = "Smoke tobacco out of a pipe other than a hookah or waterpipe"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN66GF
1 = "Smoke bidis (small brown cigarettes wrapped in a leaf)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN66HF
1 = "Smoke clove cigarettes (kreteks)"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN66IF
1 = "Use any other form of tobacco"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN66JF
1 = "No one who lives with me now uses any form of tobacco"
. = "<Missing>"
.e = "<Inconsistent>"
;
value QN67F
1 = "None"
2 = "One"
3 = "Two"
4 = "Three"
5 = "Four"
6 = "Five or more"
7 = "Not sure"
. = "<Missing>"
;
value QN68F
1 = "0"
```

```
2 = "1"
3 = "2"
4 = "3"
5 = "4"
6 = "5"
7 = "6"
8 = "7"
9 = "8"
10 = "9"
11 = "10"
. = "<Missing>"
;
value QN69F
1 = "Always be allowed"
2 = "Be allowed only at some times or in some places"
3 = "Never be allowed"
. = "<Missing>"
;
value QN70F
1 = "Always allow smoking"
2 = "Sometimes allow smoking"
3 = "Never allow smoking"
. = "<Missing>"
;
value QN71F
1 = "No harm"
2 = "Little harm"
3 = "Some harm"
4 = "A lot of harm"
. = "<Missing>"
;
value QN72AF
1 = "Smoking tobacco from a hookah or waterpipe"
. = "<Missing>"
;
value QN72BF
1 = "Smoking tobacco from a pipe other than a waterpipe"
. = "<Missing>"
;
value QN72CF
1 = "Smoking Bidis (small brown cigarettes wrapped in a leaf)"
. = "<Missing>"
;
value QN72DF
1 = "Smoking Clove cigarettes (kreteks)"
. = "<Missing>"
;
value QN72EF
1 = "Smoking flavored cigars, little cigars, and cigarillos (such as mint,
clove, spice, alcohol (wine, cognac), candy, fruit, chocolate, or other
sweets)"
. = "<Missing>"
;
value QN72FF
1 = "Smoking cigars, cigarillos, or little cigars (those that are not
flavored)"
. = "<Missing>"
```

```
;
value QN72GF
1 = "Using electronic cigarettes, such as Ruyan or NJOY"
. = "<Missing>"
;
value QN72HF
1 = "Do not know"
. = "<Missing>"
;
value QN72IF
1 = "I do not believe that any of the above products are less harmful than
cigarettes"
. = "<Missing>"
;
value QN73AF
1 = "Using chewing tobacco, snuff, or dip"
. = "<Missing>"
;
value QN73BF
1 = "Using snus, such as Camel or Marlboro Snus"
. = "<Missing>"
;
value QN73CF
1 = "Using dissolvable tobacco products, such as Ariva, Stonewall, Camel
orbs, Camel sticks, Marlboro sticks, or Camel strips"
. = "<Missing>"
;
value QN73DF
1 = "Using electronic cigarettes, such as Ruyan or NJOY"
. = "<Missing>"
;
value QN73EF
1 = "Do not know"
. = "<Missing>"
;
value QN73FF
1 = "I do not believe that any of the above products are less harmful than
cigarettes"
. = "<Missing>"
;
value QN74F
1 = "Definitely yes"
2 = "Probably yes"
3 = "Probably not"
4 = "Definitely not"
. = "<Missing>"
;
value QN75F
1 = "Definitely yes"
2 = "Probably yes"
3 = "Probably not"
4 = "Definitely not"
. = "<Missing>"
;
value QN76F
1 = "I don't use tobacco products, and my parents would strongly disapprove
if I did"
```

```
2 = "I don't use tobacco products, and my parents would not strongly
disapprove if I did"
3 = "I use tobacco products, and my parents strongly disapproved when they
first found out"
4 = "I use tobacco products, and my parents did not strongly disapprove when
they first found out"
5 = "I use tobacco products, but my parents don't know, and they would
strongly disapprove if they knew"
6 = "I use tobacco products, but my parents don't know, and they would not
strongly disapprove if they knew"
. = "<Missing>"
;
value QN77F
1 = "Yes"
2 = "No"
. = "<Missing>"
;
value QN78F
1 = "Yes"
2 = "No"
. = "<Missing>"
;
value QN79F
1 = "Yes"
2 = "No"
. = "<Missing>"
;
value QN80F
1 = "Yes"
2 = "No"
. = "<Missing>"
;
value QN81F
1 = "0 days"
2 = "1 day"
3 = "2 to 5 days"
4 = "6 to 10 days"
5 = "11 or more days"
. = "<Missing>"
;
value RACE_MF
1 = "NH-White"
2 = "NH-Black"
3 = "Hispanic"
4 = "NH-Asian"
5 = "NH-AI/AN"
6 = "NH-NHOPI"
7 = "Multiple Races"
. = "<Missing>"
;
value RACE_SF
1 = "NH-White"
2 = "NH-Black"
3 = "Hispanic"
4 = "NH-Asian"
5 = "NH-AI/AN"
6 = "NH-NHOPI"
```

```
. = "<Missing>"
;
value YESNOF
1 = "Yes"
2 = "No"
. = "<Missing>"
;
run;



*****************************************************************************
*************************
************************************     Begin my analyses
      ******************************************
*****************************************************************************
************************;

DATA TS;
      SET NYTS1.NYTS2013_DATASET;
RUN;

*Duplicate variables without formats to check coding for queries;
DATA TS;
      SET TS;
      QN35Iheard=QN35I;
      QN72Gbelief=QN72G;
      CELCIGT_Ruse=CELCIGT_R;
      QN36Itried=QN36I;
      QN37Iuse=QN37I;
      EELCIGT_Rtried=EELCIGT_R;
run;

*RECODE PLAN:
Out of participants Only participants who checked that they had Heard of e-
cigs will be included in the analysis.;

*Create include1 var;
DATA TS;
      SET TS;
/*Construct 1-2 include variable*/
      IF          QN35Iheard=1      THEN  INCLUDE1=1;
      ELSE INCLUDE1=2;
RUN;
*Check recode;
PROC FREQ DATA=TS;
      TABLES INCLUDE1*QN35Iheard / MISSING;
RUN; *Recode confirmed;

*Apply the include  variable to the variables of analytic interest:
      qn72gbelief
      CELCIGT_Ruse;
DATA TS;
      SET TS;

      If INCLUDE1=1 AND qn72gbelief=. THEN qn72gbeliefNEW=2; /*does not
```

```
believe e-cigs are safer*/
      ELSE IF INCLUDE1=1 AND qn72gbelief=1 THEN qn72gbeliefNEW=1; /*does
believe e-cigs are safer*/
      ELSE IF INCLUDE1=2 THEN qn72gbeliefNEW=.; /*not include*/
      ELSE qn72gbeliefNEW= .R; /*recoded improperly - don't want any of
these*/

      IF INCLUDE1=2 THEN CELCIGT_RuseNEW=.;
      ELSE IF INCLUDE1=1 THEN CELCIGT_RuseNEW=CELCIGT_Ruse;
      ELSE CELCIGT_RuseNEW= .R;
RUN;
*Check recode;
PROC FREQ DATA=TS;
      TABLES qn72gbeliefNEW*(INCLUDE1 qn72gbelief) CELCIGT_RuseNEW*(INCLUDE1
CELCIGT_Ruse) / MISSING;
RUN; *SUCCESS;

*Finish off recodes;
*QUIT30 - new var
Respondent does or does not intend to quit smoking cigs within the next 30
days
      Original var:     QN53 - asks what timeframe respondent intends to quit
within
            1                 I don't smoke (exclude)
            2                 Within 30 DAYS
            3 4 5 6     Intends to quit in more than 30 days (includes
never);
data TS;
      set TS;
      if qn53=. then QUIT30=.;
      else if qn53 = 1 then QUIT30 = . ;
      else if qn53 = 2 then QUIT30 = 1;
      else QUIT30 = 2;
run;
PROC FREQ DATA=TS;
      TABLES QUIT30*QN53 / MISSING;
RUN;

*PASTQUIT - an ever/never recode of a question about how long they have
stayed of cigs in an effort to quit;
DATA TS;
      SET TS;
      IF QN55 = 1 THEN PASTQUIT=. ; *EXCLUDE NON SMOKERS;
      ELSE IF QN55 = . THEN PASTQUIT=. ;
      ELSE IF QN55 = 2 THEN PASTQUIT=2; *NEVER TRIED TO QUIT;
      ELSE PASTQUIT=1; *HAS TRIED TO QUIT;
RUN;
PROC FREQ DATA=TS;
      TABLES QN55*PASTQUIT;
RUN;

*RECODE AGE INTO GROUPS;
DATA TS;
      SET TS;
      IF (1<=QN1=<4)          THEN AGEGROUP=1; /*9-12 YEARS*/
      ELSE IF (5<=QN1<=7)     THEN AGEGROUP=2; /*13-15 YEARS*/
      ELSE IF (8<=QN1<=9)     THEN AGEGROUP=3; /*16-17 YEARS*/
```

```
      ELSE IF (10<=QN1<=11) THEN AGEGROUP=4; /*18+*/
      ELSE AGEGROUP=.;
RUN;
      PROC FREQ DATA=TS;
            TABLES QN1*AGEGROUP / MISSING;
      RUN;

*RECODE SEX AND HISPANIC;
DATA TS;
      SET TS;
      SEX=QN2;

      IF (QN4B=1 OR QN4C=1 OR QN4D=1 OR QN4E=1) THEN HISP=1;
      ELSE IF QN4A=1 THEN HISP=2; /*non hispanic*/
      ELSE HISP=.R;
RUN;
PROC FREQ DATA=TS;
      TABLES HISP*(QN4A QN4B QN4C QN4D QN4E) /MISSING;
RUN; /*CORRECT*/
PROC FREQ DATA=TS;
      TABLES SEX*QN2 / MISSING;
RUN;

/*Use hispanic var to recode race*/
DATA TS;
      SET TS;
/*Race is a 5-item check all that apply. Participants who checked multiple
will be in the other/mult category
      Recode will be 1=nh white, 2=nh black, 3=hispanic, 4=other/mult*/
      IF QN5A=. THEN QN5A=0;
      IF QN5B=. THEN QN5B=0;
      IF QN5C=. THEN QN5C=0;
      IF QN5D=. THEN QN5D=0;
      IF QN5E=. THEN QN5E=0;

      MULTRACETESTVAR=QN5A + QN5B + QN5C + QN5D + QN5E;
      IF HISP=1 THEN RACE=3; /*hispanic*/
      ELSE IF MULTRACETESTVAR>1 THEN RACE=4; /*NH multi/other*/
      ELSE IF (QN5A=1 OR QN5B=1 OR QN5D=1)THEN RACE=4; /*NH other/multi*/
      ELSE IF QN5C=1 THEN RACE=2; /*NH BLACK*/
      ELSE IF QN5E=1 THEN RACE=1; /*NH WHITE*/
RUN;

PROC FREQ DATA=TS;
      TABLES MULTRACETESTVAR RACE*(MULTRACETESTVAR HISP QN5A QN5B QN5C QN5D
QN5E)/ MISSING;
RUN;
/*SUCCESS!*/


*Create the final dataset to work with with simplified variable names;
DATA TS;
      SET TS;
      BELIEF=qn72gbeliefNEW;
      ECIG30=CELCIGT_RuseNEW; /*outcome*/
/*    QUIT30                              */
/*    PASTQUIT                    confounder*/
```

```
/*     AGEGROUP                        confounder*/
/*     RACE                            confounder*/
/*     SEX                                   confounder*/
RUN;

*Confine all vars to students who both smoked and heard of e-cigs;
DATA TS;
      SET TS;
      IF INCLUDE1=2 THEN QUIT30=.;
      IF INCLUDE1=2 THEN PASTQUIT=.;
      IF INCLUDE1=2 THEN AGEGROUP=.;
      IF INCLUDE1=2 THEN RACE=.;
      IF INCLUDE1=2 THEN SEX=.;
      IF INCLUDE1=2 THEN ECIG30=.;

      /* IF QN53=1  ::  non smokers, classified by response to the pre-recode
exposure var*/

      IF QN53=1 THEN BELIEF=.;
      IF QN53=1 THEN ECIG30=.;
      IF QN53=1 THEN PASTQUIT=.;
      IF QN53=1 THEN AGEGROUP=.;
      IF QN53=1 THEN RACE=.;
      IF QN53=1 THEN SEX=.;
RUN;

PROC FREQ DATA=TS;
      TABLES INCLUDE1*(ECIG30 QUIT30 PASTQUIT AGEGROUP RACE SEX) QN53*(BELIEF
QUIT30 PASTQUIT AGEGROUP RACE SEX) / MISSING;
RUN;


*Save out recoded permanent dataset;
DATA NYTS1.TS_ALLRECODES_425;
      SET TS;
RUN;
**************************************************END DATA
CLEANING************************************************
********************************************************************************
*****************************************
********************************************************************************
*****************************************
********************************************************************************
*****************************************
********************************************************************************
*****************************************
********************************************************************************
*****************************************
********************************************************************************
*****************************************
********************************************************************************
*****************************************;

****************************************DESCRIPTIVE
STATISTICS****************************************;

proc SURVEYfreq data=TS;
```

```
      TITLE 'Descriptives With Chi Sq and Col %';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      tables ECIG30*(QUIT30 BELIEF PASTQUIT AGEGROUP RACE SEX) / CHISQ COL  ;
RUN;


*****************************************UNIVARIATE
MODELS*************************************;

* "Modeling the probability that ECIG30=1" --> that respondent has used ecigs
in the past 30 days;
PROC SURVEYLOGISTIC DATA=TS;
      TITLE;
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF ;
run;
PROC SURVEYLOGISTIC DATA=TS;
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  / PARAM=REF;
      MODEL ECIG30  = QUIT30;
run;

PROC SURVEYLOGISTIC DATA=TS;
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  / PARAM=REF;
      MODEL ECIG30  = PASTQUIT;
run;
PROC SURVEYLOGISTIC DATA=TS;
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       AGEGROUP (REF=last) /*18+*/
                  / PARAM=REF;
      MODEL ECIG30  = AGEGROUP ;
run;
PROC SURVEYLOGISTIC DATA=TS;
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = RACE ;
run;
PROC SURVEYLOGISTIC DATA=TS;
```

```
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       SEX (REF=LAST) /*female*/
                  / PARAM=REF;
      MODEL ECIG30  = SEX ;
run;

****************************************MULTIVARIATE
MODELS*************************************;

*No interaction term;
PROC SURVEYLOGISTIC DATA=TS;
      title       'Multivariate - No interaction term';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=LAST) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 PASTQUIT AGEGROUP RACE SEX ;
RUN;


*Interaction term;
PROC SURVEYLOGISTIC DATA=TS;
      TITLE       'Interaction Multivariate';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 BELIEF*QUIT30 PASTQUIT AGEGROUP RACE SEX
;
RUN;

*Stratified by quit intent;
PROC SURVEYLOGISTIC DATA=TS;
      TITLE       'Stratified by quit30';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      domain      quit30;
      CLASS       BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
```

```
                SEX (REF=LAST) /*female*/
                RACE (REF=FIRST) /*NH white*/
                / PARAM=REF;
      MODEL ECIG30  = BELIEF PASTQUIT AGEGROUP RACE SEX ;
RUN;


*Stratified by belief;
PROC SURVEYLOGISTIC DATA=TS;
      TITLE       'Stratified by BELIEF';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      domain      BELIEF;
      CLASS       PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  / PARAM=REF;
      MODEL ECIG30  =  QUIT30 PASTQUIT AGEGROUP RACE SEX ;
RUN;


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*********************************Negative Control Analysis Using
Hookah*********************************;

DATA TS;
      SET TS;
      QN35Fheard=QN35F;
      QN72abelief=QN72a;
      CHOOKAH_Ruse=CHOOKAH_R;
run;

*RECODE PLAN:
Only participants who checked that they had Heard of HOOKAH will be included
in the analysis.;

*Create includeH var;
DATA TS;
      SET TS;
/*Construct 1-2 include variable*/
      IF          QN35Fheard=1      THEN  INCLUDEH=1;
```

```
      ELSE  INCLUDEH=2;
RUN;
*Check recode;
PROC FREQ DATA=TS;
      TABLES INCLUDEH*QN35Fheard / MISSING;
RUN; *Recode confirmed;

*Apply the includeH variable;
DATA TS;
      SET TS;

      If INCLUDEH=1           AND QN72abelief=. THEN QN72abeliefNEW=2; /*does
not believe hookah safer*/
      ELSE IF INCLUDEH=1      AND QN72abelief=1 THEN QN72abeliefNEW=1; /*does
believe HOOKAH safer*/
      ELSE IF INCLUDEH=2      THEN QN72abeliefNEW=.; /*not include*/
      ELSE QN72abeliefNEW= .R; /*recoded improperly - don't want any of
these*/

      IF INCLUDEH=2           THEN CHOOKAH_RuseNEW=.;
      ELSE IF INCLUDEH=1      THEN CHOOKAH_RuseNEW=CHOOKAH_Ruse;
      ELSE CHOOKAH_RuseNEW= .R;
RUN;
*Check recode;
PROC FREQ DATA=TS;
      TABLES QN72abeliefNEW*(INCLUDEH QN72abelief) CHOOKAH_RuseNEW*(INCLUDEH
CHOOKAH_Ruse) / MISSING;
RUN; *SUCCESS;

*Create the final dataset to work with with simplified variable names;
DATA TS;
      SET TS;
      BeliefHookah=QN72abeliefNEW;
      HOOKAH30=CHOOKAH_RuseNEW; /*outcome*/
/*    QUIT30                          */
/*    PASTQUIT                  confounder*/
/*    AGEGROUP                  confounder*/
/*    RACE                      confounder*/
/*    SEX                             confounder*/
RUN;

*Confine all vars to students who both smoked cigs and heard of HOOKAH;
DATA HookahAnalysis;
      SET TS;
      IF INCLUDEH=2 THEN QUIT30=.;
      IF INCLUDEH=2 THEN PASTQUIT=.;
      IF INCLUDEH=2 THEN AGEGROUP=.;
      IF INCLUDEH=2 THEN RACE=.;
      IF INCLUDEH=2 THEN SEX=.;
      IF INCLUDEH=2 THEN HOOKAH30=.;

      /* IF QN53=1  ::  non smokers, classified by response to the pre-recode
exposure var*/

      IF QN53=1 THEN BeliefHookah=.;
      IF QN53=1 THEN HOOKAH30=.;
      IF QN53=1 THEN PASTQUIT=.;
```

```
      IF QN53=1 THEN AGEGROUP=.;
      IF QN53=1 THEN RACE=.;
      IF QN53=1 THEN SEX=.;
RUN;

PROC FREQ DATA=HookahAnalysis;
      TABLES INCLUDEH*(HOOKAH30 QUIT30 PASTQUIT AGEGROUP RACE SEX)
QN53*(BeliefHookah QUIT30 PASTQUIT AGEGROUP RACE SEX) / MISSING;
RUN;

*No interaction term;
PROC SURVEYLOGISTIC DATA=HookahAnalysis;
      title       'Multivariate - No interaction term';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BeliefHookah (REF=LAST) /*does not believe safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=LAST) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL HOOKAH30  = BeliefHookah QUIT30 PASTQUIT AGEGROUP RACE SEX ;
RUN;

*Interaction term;
PROC SURVEYLOGISTIC DATA=HookahAnalysis;
      TITLE       'Interaction Multivariate';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BeliefHookah (REF=LAST) /*does not believe safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL HOOKAH30  = BeliefHookah QUIT30 BeliefHookah*QUIT30 PASTQUIT
AGEGROUP RACE SEX ;
RUN;


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****************************************     Sensitivity Analysis: Quit
within 6 months***********************************;
*QUIT6MO - new var
Respondent does or does not intend to quit smoking cigs within the next 6
months
      Original var:     QN53 - asks what timeframe respondent intends to quit
within
            1                 I don't smoke (exclude)
            2 3         Within 6 mo
            4 5 6         Intends to quit in more than 6 months (includes
never);
data sixmo;
      set TS;
      if qn53=. then QUIT6MO=.;
      else if qn53 = 1 then QUIT6MO = . ;
      else if qn53 = 2 then QUIT6MO = 1;
      else if qn53 = 3 then QUIT6MO = 1;
      else QUIT6MO = 2;
      IF INCLUDE1=2 THEN QUIT6MO=.;
run;
PROC FREQ DATA=SIXMO;
      TABLES QUIT6MO*(INCLUDE1 QN53) / MISSING;
RUN;


*No interaction term;
PROC SURVEYLOGISTIC DATA=sixmo;
      title       'Multivariate - No interaction term';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT6MO (REF=LAST) /*does not intend to quit within 6 mo*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=LAST) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT6MO PASTQUIT AGEGROUP RACE SEX ;
RUN;

*Interaction term;
PROC SURVEYLOGISTIC DATA=sixmo;
      TITLE       'Interaction Multivariate';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT6MO (REF=LAST) /*does not intend to quit*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT6MO BELIEF*QUIT6MO PASTQUIT AGEGROUP RACE
SEX ;
RUN;
```

```
*Stratified;
PROC SURVEYLOGISTIC DATA=sixmo;
      TITLE       'Stratified by quit6mo';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      domain      QUIT6MO;
      CLASS       BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF PASTQUIT AGEGROUP RACE SEX ;
RUN;

**********************************Sensitivity Analysis 1 - Less Stringent
Exclusion Criteria**********************************;
*Done out of concern that we are excluding e-cigarette users who mistakenly
did not check the 'heard' box.;
*RECODE PLAN:
Only participants who EITHER checked that they had Heard of e-cigs,
OR who checked that they use e-cigs will be included in the analysis.;

DATA SA;
      SET NYTS1.NYTS2013_DATASET;
      QN35Iheard=QN35I;
      QN72Gbelief=QN72G;
      CELCIGT_Ruse=CELCIGT_R;
      QN36Itried=QN36I;
      QN37Iuse=QN37I;
      EELCIGT_Rtried=EELCIGT_R;
run;



*Create include1 var;
DATA sa;
      SET sa;
/*Construct 1-2 include variable*/
      IF          QN35Iheard=1      THEN  INCLUDE1=1;
      ELSE IF CELCIGT_Ruse=1 THEN INCLUDE1=1;
      ELSE INCLUDE1=2;
RUN;
*Check recode;
PROC FREQ DATA=SA;
      TITLE '';
      TABLES INCLUDE1*(QN35Iheard CELCIGT_Ruse QN72Gbelief) / MISSING;
RUN; *Recode confirmed;

*Apply the include  variable to the variables of analytic interest:
      qn72gbelief
      CELCIGT_Ruse;
DATA SA;
      SET SA;
/*exclude all from believe var if include=2*/
```

```
      If INCLUDE1=1 AND qn72gbelief=. THEN qn72gbeliefNEW=2; /*does not
believe e-cigs are safer*/
      ELSE IF INCLUDE1=1 AND qn72gbelief=1 THEN qn72gbeliefNEW=1; /*does
believe e-cigs are safer*/
      ELSE IF INCLUDE1=2 THEN qn72gbeliefNEW=.; /*not include*/
      ELSE qn72gbeliefNEW= .R; /*recoded improperly - don't want any of
these*/

      IF INCLUDE1=2 AND CELCIGT_Ruse NOT=1 THEN CELCIGT_RuseNEW=.; /*exclude
if did not check either box*/
      ELSE IF INCLUDE1=2 AND CELCIGT_Ruse=1 THEN CELCIGT_RuseNEW=1; /*include
if only checked ecig use box*/
      ELSE IF INCLUDE1=1 THEN CELCIGT_RuseNEW=CELCIGT_Ruse; /*include if
checked include box*/
      ELSE CELCIGT_RuseNEW= .R;
RUN;
*Check recode;
PROC FREQ DATA=sa;
      TABLES qn72gbeliefNEW*(INCLUDE1 qn72gbelief) CELCIGT_RuseNEW*(INCLUDE1
CELCIGT_Ruse) / MISSING;
RUN; *SUCCESS;

*Finish off recodes;
*QUIT30 - new var
Respondent does or does not intend to quit smoking cigs within the next 30
days
      Original var:     QN53 - asks what timeframe respondent intends to quit
within
            1                 I don't smoke (exclude)
            2                 Within 30 DAYS
            3 4 5 6     Intends to quit in more than 30 days (includes
never);
data sa;
      set sa;
      if qn53=. then QUIT30=.;
      else if qn53 = 1 then QUIT30 = . ;
      else if qn53 = 2 then QUIT30 = 1;
      else QUIT30 = 2;
run;
PROC FREQ DATA=sa;
      TABLES QUIT30*QN53 / MISSING;
RUN;

*PASTQUIT - an ever/never recode of a question about how long they have
stayed of cigs in an effort to quit;
DATA sa;
      SET sa;
      IF QN55 = 1 THEN PASTQUIT=. ; *EXCLUDE NON SMOKERS;
      ELSE IF QN55 = . THEN PASTQUIT=. ;
      ELSE IF QN55 = 2 THEN PASTQUIT=2; *NEVER TRIED TO QUIT;
      ELSE PASTQUIT=1; *HAS TRIED TO QUIT;
RUN;
PROC FREQ DATA=sa;
      TABLES QN55*PASTQUIT;
RUN;

*RECODE AGE INTO GROUPS;
```

```
DATA sa;
      SET sa;
      IF (1<=QN1=<4)          THEN AGEGROUP=1; /*9-12 YEARS*/
      ELSE IF (5<=QN1<=7)     THEN AGEGROUP=2; /*13-15 YEARS*/
      ELSE IF (8<=QN1<=9)     THEN AGEGROUP=3; /*16-17 YEARS*/
      ELSE IF (10<=QN1<=11) THEN AGEGROUP=4; /*18+*/
      ELSE AGEGROUP=.;
RUN;
      PROC FREQ DATA=sa;
            TABLES QN1*AGEGROUP / MISSING;
      RUN;

*RECODE SEX AND HISPANIC;
DATA sa;
      SET sa;
      SEX=QN2;

      IF (QN4B=1 OR QN4C=1 OR QN4D=1 OR QN4E=1) THEN HISP=1;
      ELSE IF QN4A=1 THEN HISP=2; /*non hispanic*/
      ELSE HISP=.R;
RUN;
PROC FREQ DATA=sa;
      TABLES HISP*(QN4A QN4B QN4C QN4D QN4E) /MISSING;
RUN; /*CORRECT*/
PROC FREQ DATA=sa;
      TABLES SEX*QN2 / MISSING;
RUN;

/*Use hispanic var to recode race*/
DATA sa;
      SET sa;
/*Race is a 5-item check all that apply. Participants who checked multiple
will be in the other/mult category
      Recode will be 1=nh white, 2=nh black, 3=hispanic, 4=other/mult*/
      IF QN5A=. THEN QN5A=0;
      IF QN5B=. THEN QN5B=0;
      IF QN5C=. THEN QN5C=0;
      IF QN5D=. THEN QN5D=0;
      IF QN5E=. THEN QN5E=0;

      MULTRACETESTVAR=QN5A + QN5B + QN5C + QN5D + QN5E;
      IF HISP=1 THEN RACE=3; /*hispanic*/
      ELSE IF MULTRACETESTVAR>1 THEN RACE=4; /*NH multi/other*/
      ELSE IF (QN5A=1 OR QN5B=1 OR QN5D=1)THEN RACE=4; /*NH other/multi*/
      ELSE IF QN5C=1 THEN RACE=2; /*NH BLACK*/
      ELSE IF QN5E=1 THEN RACE=1; /*NH WHITE*/
RUN;

PROC FREQ DATA=sa;
      TABLES MULTRACETESTVAR RACE*(MULTRACETESTVAR HISP QN5A QN5B QN5C QN5D
QN5E)/ MISSING;
RUN;
/*SUCCESS!*/


*Create the final dataset to work with with simplified variable names;
DATA sa;
```

```
      SET sa;
      BELIEF=qn72gbeliefNEW;
      ECIG30=CELCIGT_RuseNEW; /*outcome*/
/*    QUIT30                          */
/*    PASTQUIT                  confounder*/
/*    AGEGROUP                  confounder*/
/*    RACE                      confounder*/
/*    SEX                             confounder*/
RUN;

*Confine all vars to inclusion criteria;
DATA sa;
      SET sa;
      IF INCLUDE1=2 THEN QUIT30=.;
      IF INCLUDE1=2 THEN PASTQUIT=.;
      IF INCLUDE1=2 THEN AGEGROUP=.;
      IF INCLUDE1=2 THEN RACE=.;
      IF INCLUDE1=2 THEN SEX=.;

      /* IF QN53=1  ::  non smokers, classified by response to the pre-recode
exposure var*/

      IF QN53=1 THEN BELIEF=.;
      IF QN53=1 THEN ECIG30=.;
      IF QN53=1 THEN PASTQUIT=.;
      IF QN53=1 THEN AGEGROUP=.;
      IF QN53=1 THEN RACE=.;
      IF QN53=1 THEN SEX=.;
RUN;

PROC FREQ DATA=sa;
      TABLES INCLUDE1*(ECIG30 QUIT30 PASTQUIT AGEGROUP RACE SEX) QN53*(BELIEF
QUIT30 PASTQUIT AGEGROUP RACE SEX) / MISSING;
RUN;

*No interaction term;
PROC SURVEYLOGISTIC DATA=sa;
      title       'Sensitivity Analysis - Multivariate - No interaction
term';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=LAST) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 PASTQUIT AGEGROUP RACE SEX ;
RUN;


*Interaction term;
PROC SURVEYLOGISTIC DATA=sa;
      TITLE       'Sensitivity Analysis - Interaction Multivariate';
```

```
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 BELIEF*QUIT30 PASTQUIT AGEGROUP RACE SEX
;
RUN;

*Stratified;
PROC SURVEYLOGISTIC DATA=sa;
      TITLE       'Sensitivity Analysis - Stratified by quit30';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      domain      quit30;
      CLASS       BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF PASTQUIT AGEGROUP RACE SEX ;
RUN;


*****************************************************************************
****************************************************
************************************Sensitivity Analysis 2 - Less Stringent
Exclusion Criteria************************************;
*Done out of concern that we are excluding students who mistakenly did not
check the 'heard' box.;
*RECODE PLAN:
Only participants who EITHER checked that they had Heard of e-cigs,
OR who checked that they use e-cigs
OR who checked that they believe e-cigs are safer will be included in the
analysis.;

DATA SA;
      SET NYTS1.NYTS2013_DATASET;
      QN35Iheard=QN35I;
      QN72Gbelief=QN72G;
      CELCIGT_Ruse=CELCIGT_R;
      QN36Itried=QN36I;
      QN37Iuse=QN37I;
      EELCIGT_Rtried=EELCIGT_R;
run;


*Create include1 var;
DATA sa;
```

```
      SET sa;
/*Construct 1-2 include variable*/
      IF          QN35Iheard=1 THEN INCLUDE1=1;
      ELSE IF QN72Gbelief=1  THEN INCLUDE1=1;
      ELSE IF CELCIGT_Ruse=1 THEN INCLUDE1=1;
      ELSE INCLUDE1=2;
RUN;
*Check recode;
PROC FREQ DATA=SA;
      TITLE '';
      TABLES INCLUDE1*(QN35Iheard CELCIGT_Ruse QN72Gbelief) / MISSING;
RUN; *Recode confirmed;

*Apply the include  variable to the variables of analytic interest:
      qn72gbelief
      CELCIGT_Ruse;
DATA SA;
      SET SA;

      If INCLUDE1=1 AND qn72gbelief=. THEN qn72gbeliefNEW=2; /*does not
believe e-cigs are safer*/
      ELSE IF INCLUDE1=1 AND qn72gbelief=1 THEN qn72gbeliefNEW=1; /*does
believe e-cigs are safer*/
      ELSE IF INCLUDE1=2 AND qn72gbelief=. THEN qn72gbeliefNEW=.; /*not
include*/
      ELSE IF INCLUDE1=2 AND qn72gbelief=1 THEN qn72gbeliefNEW=1; /*does
believe e-cigs safer */
      ELSE qn72gbeliefNEW= .R; /*recoded improperly - don't want any of
these*/

      IF INCLUDE1=2 AND CELCIGT_Ruse NOT=1 THEN CELCIGT_RuseNEW=.; /*not
include*/
      ELSE IF INCLUDE1=2 AND CELCIGT_Ruse=1 THEN CELCIGT_RuseNEW=1;
/*include*/
      ELSE IF INCLUDE1=1 THEN CELCIGT_RuseNEW=CELCIGT_Ruse; /*include*/
      ELSE CELCIGT_RuseNEW= .R;
RUN;
*Check recode;
PROC FREQ DATA=sa;
      TABLES qn72gbeliefNEW*(INCLUDE1 qn72gbelief) CELCIGT_RuseNEW*(INCLUDE1
CELCIGT_Ruse) / MISSING;
RUN; *SUCCESS;

*Finish off recodes;
*QUIT30 - new var
Respondent does or does not intend to quit smoking cigs within the next 30
days
      Original var:     QN53 - asks what timeframe respondent intends to quit
within
            1                 I don't smoke (exclude)
            2                 Within 30 DAYS
            3 4 5 6     Intends to quit in more than 30 days (includes
never);
data sa;
      set sa;
      if qn53=. then QUIT30=.;
      else if qn53 = 1 then QUIT30 = . ;
```

```
      else if qn53 = 2 then QUIT30 = 1;
      else QUIT30 = 2;
run;
PROC FREQ DATA=sa;
      TABLES QUIT30*QN53 / MISSING;
RUN;

*PASTQUIT - an ever/never recode of a question about how long they have
stayed of cigs in an effort to quit;
DATA sa;
      SET sa;
      IF QN55 = 1 THEN PASTQUIT=. ; *EXCLUDE NON SMOKERS;
      ELSE IF QN55 = . THEN PASTQUIT=. ;
      ELSE IF QN55 = 2 THEN PASTQUIT=2; *NEVER TRIED TO QUIT;
      ELSE PASTQUIT=1; *HAS TRIED TO QUIT;
RUN;
PROC FREQ DATA=sa;
      TABLES QN55*PASTQUIT;
RUN;

*RECODE AGE INTO GROUPS;
DATA sa;
      SET sa;
      IF (1<=QN1=<4)          THEN AGEGROUP=1; /*9-12 YEARS*/
      ELSE IF (5<=QN1<=7)     THEN AGEGROUP=2; /*13-15 YEARS*/
      ELSE IF (8<=QN1<=9)     THEN AGEGROUP=3; /*16-17 YEARS*/
      ELSE IF (10<=QN1<=11) THEN AGEGROUP=4; /*18+*/
      ELSE AGEGROUP=.;
RUN;
      PROC FREQ DATA=sa;
            TABLES QN1*AGEGROUP / MISSING;
      RUN;

*RECODE SEX AND HISPANIC;
DATA sa;
      SET sa;
      SEX=QN2;

      IF (QN4B=1 OR QN4C=1 OR QN4D=1 OR QN4E=1) THEN HISP=1;
      ELSE IF QN4A=1 THEN HISP=2; /*non hispanic*/
      ELSE HISP=.R;
RUN;
PROC FREQ DATA=sa;
      TABLES HISP*(QN4A QN4B QN4C QN4D QN4E) /MISSING;
RUN; /*CORRECT*/
PROC FREQ DATA=sa;
      TABLES SEX*QN2 / MISSING;
RUN;

/*Use hispanic var to recode race*/
DATA sa;
      SET sa;
/*Race is a 5-item check all that apply. Participants who checked multiple
will be in the other/mult category
      Recode will be 1=nh white, 2=nh black, 3=hispanic, 4=other/mult*/
      IF QN5A=. THEN QN5A=0;
      IF QN5B=. THEN QN5B=0;
```

```
      IF QN5C=. THEN QN5C=0;
      IF QN5D=. THEN QN5D=0;
      IF QN5E=. THEN QN5E=0;

      MULTRACETESTVAR=QN5A + QN5B + QN5C + QN5D + QN5E;
      IF HISP=1 THEN RACE=3; /*hispanic*/
      ELSE IF MULTRACETESTVAR>1 THEN RACE=4; /*NH multi/other*/
      ELSE IF (QN5A=1 OR QN5B=1 OR QN5D=1)THEN RACE=4; /*NH other/multi*/
      ELSE IF QN5C=1 THEN RACE=2; /*NH BLACK*/
      ELSE IF QN5E=1 THEN RACE=1; /*NH WHITE*/
RUN;

PROC FREQ DATA=sa;
      TABLES MULTRACETESTVAR RACE*(MULTRACETESTVAR HISP QN5A QN5B QN5C QN5D
QN5E)/ MISSING;
RUN;
/*SUCCESS!*/


*Create the final dataset to work with with simplified variable names;
DATA sa;
      SET sa;
      BELIEF=qn72gbeliefNEW;
      ECIG30=CELCIGT_RuseNEW; /*outcome*/
/*    QUIT30                          */
/*    PASTQUIT                  confounder*/
/*    AGEGROUP                  confounder*/
/*    RACE                      confounder*/
/*    SEX                             confounder*/
RUN;

*Confine all vars to inclusion criteria;
DATA sa;
      SET sa;
      IF INCLUDE1=2 THEN QUIT30=.;
      IF INCLUDE1=2 THEN PASTQUIT=.;
      IF INCLUDE1=2 THEN AGEGROUP=.;
      IF INCLUDE1=2 THEN RACE=.;
      IF INCLUDE1=2 THEN SEX=.;

      /* IF QN53=1  ::  non smokers, classified by response to the pre-recode
exposure var*/

      IF QN53=1 THEN BELIEF=.;
      IF QN53=1 THEN ECIG30=.;
      IF QN53=1 THEN PASTQUIT=.;
      IF QN53=1 THEN AGEGROUP=.;
      IF QN53=1 THEN RACE=.;
      IF QN53=1 THEN SEX=.;
RUN;

PROC FREQ DATA=sa;
      TABLES INCLUDE1*(ECIG30 QUIT30 PASTQUIT AGEGROUP RACE SEX) QN53*(BELIEF
QUIT30 PASTQUIT AGEGROUP RACE SEX) / MISSING;
RUN;

*No interaction term;
```

```
PROC SURVEYLOGISTIC DATA=sa;
      title       'Sensitivity Analysis 2 - Multivariate - No interaction
term';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=LAST) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 PASTQUIT AGEGROUP RACE SEX ;
RUN;


*Interaction term;
PROC SURVEYLOGISTIC DATA=sa;
      TITLE       'Sensitivity Analysis 2 - Interaction Multivariate';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 BELIEF*QUIT30 PASTQUIT AGEGROUP RACE SEX
;
RUN;

*Stratified;
PROC SURVEYLOGISTIC DATA=sa;
      TITLE       'Sensitivity Analysis 2 - Stratified by quit30';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      domain      quit30;
      CLASS       BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF PASTQUIT AGEGROUP RACE SEX ;
RUN;

*View the pattern of inconsistent cases that are being included;
proc print data=sa;
      where qn35iheard not = 1 and (belief=1 or ecig30=1);
      var qn35iheard belief EELCIGT_Rtried ecig30;
run; *extremely inconsistent;
```

```
*******************************************************************************
************************************************
***********************************Sensitivity Analysis 3 - Less Stringent
Exclusion Criteria************************************;
*Done out of concern that we are excluding students who mistakenly did not
check the 'heard' box.;
*RECODE PLAN:
Only participants who EITHER checked that they had Heard of e-cigs,
OR who checked that they believe e-cigs are safer will be included in the
analysis.;

DATA SA;
      SET NYTS1.NYTS2013_DATASET;
      QN35Iheard=QN35I;
      QN72Gbelief=QN72G;
      CELCIGT_Ruse=CELCIGT_R;
      QN36Itried=QN36I;
      QN37Iuse=QN37I;
      EELCIGT_Rtried=EELCIGT_R;
run;

*Create include1 var;
DATA sa;
      SET sa;
/*Construct 1-2 include variable*/
      IF          QN35Iheard=1 THEN INCLUDE1=1;
      ELSE IF QN72Gbelief=1  THEN INCLUDE1=1;
      ELSE INCLUDE1=2;
RUN;
*Check recode;
PROC FREQ DATA=SA;
      TITLE '';
      TABLES INCLUDE1*(QN35Iheard CELCIGT_Ruse QN72Gbelief) / MISSING;
RUN; *Recode confirmed;

*Apply the include  variable to the variables of analytic interest:
      qn72gbelief
      CELCIGT_Ruse;
DATA SA;
      SET SA;

      If INCLUDE1=1 AND qn72gbelief=. THEN qn72gbeliefNEW=2; /*does not
believe e-cigs are safer*/
      ELSE IF INCLUDE1=1 AND qn72gbelief=1 THEN qn72gbeliefNEW=1; /*does
believe e-cigs are safer*/
      ELSE IF INCLUDE1=2 AND qn72gbelief=. THEN qn72gbeliefNEW=.; /*not
include*/
      ELSE IF INCLUDE1=2 AND qn72gbelief=1 THEN qn72gbeliefNEW=1; /*does
believe e-cigs safer */
      ELSE qn72gbeliefNEW= .R; /*recoded improperly - don't want any of
these*/

      IF INCLUDE1=2 THEN CELCIGT_RuseNEW=.; /*not include*/
      ELSE IF INCLUDE1=1 THEN CELCIGT_RuseNEW=CELCIGT_Ruse; /*include*/
```

```
      ELSE CELCIGT_RuseNEW= .R;
RUN;
*Check recode;
PROC FREQ DATA=sa;
      TABLES qn72gbeliefNEW*(INCLUDE1 qn72gbelief) CELCIGT_RuseNEW*(INCLUDE1
CELCIGT_Ruse) / MISSING;
RUN; *SUCCESS;

*Finish off recodes;
*QUIT30 - new var
Respondent does or does not intend to quit smoking cigs within the next 30
days
      Original var:     QN53 - asks what timeframe respondent intends to quit
within
            1                 I don't smoke (exclude)
            2                 Within 30 DAYS
            3 4 5 6     Intends to quit in more than 30 days (includes
never);
data sa;
      set sa;
      if qn53=. then QUIT30=.;
      else if qn53 = 1 then QUIT30 = . ;
      else if qn53 = 2 then QUIT30 = 1;
      else QUIT30 = 2;
run;
PROC FREQ DATA=sa;
      TABLES QUIT30*QN53 / MISSING;
RUN;

*PASTQUIT - an ever/never recode of a question about how long they have
stayed of cigs in an effort to quit;
DATA sa;
      SET sa;
      IF QN55 = 1 THEN PASTQUIT=. ; *EXCLUDE NON SMOKERS;
      ELSE IF QN55 = . THEN PASTQUIT=. ;
      ELSE IF QN55 = 2 THEN PASTQUIT=2; *NEVER TRIED TO QUIT;
      ELSE PASTQUIT=1; *HAS TRIED TO QUIT;
RUN;
PROC FREQ DATA=sa;
      TABLES QN55*PASTQUIT;
RUN;

*RECODE AGE INTO GROUPS;
DATA sa;
      SET sa;
      IF (1<=QN1=<4)          THEN AGEGROUP=1; /*9-12 YEARS*/
      ELSE IF (5<=QN1<=7)     THEN AGEGROUP=2; /*13-15 YEARS*/
      ELSE IF (8<=QN1<=9)     THEN AGEGROUP=3; /*16-17 YEARS*/
      ELSE IF (10<=QN1<=11) THEN AGEGROUP=4; /*18+*/
      ELSE AGEGROUP=.;
RUN;
      PROC FREQ DATA=sa;
            TABLES QN1*AGEGROUP / MISSING;
      RUN;

*RECODE SEX AND HISPANIC;
DATA sa;
```

```
      SET sa;
      SEX=QN2;

      IF (QN4B=1 OR QN4C=1 OR QN4D=1 OR QN4E=1) THEN HISP=1;
      ELSE IF QN4A=1 THEN HISP=2; /*non hispanic*/
      ELSE HISP=.R;
RUN;
PROC FREQ DATA=sa;
      TABLES HISP*(QN4A QN4B QN4C QN4D QN4E) /MISSING;
RUN; /*CORRECT*/
PROC FREQ DATA=sa;
      TABLES SEX*QN2 / MISSING;
RUN;

/*Use hispanic var to recode race*/
DATA sa;
      SET sa;
/*Race is a 5-item check all that apply. Participants who checked multiple
will be in the other/mult category
      Recode will be 1=nh white, 2=nh black, 3=hispanic, 4=other/mult*/
      IF QN5A=. THEN QN5A=0;
      IF QN5B=. THEN QN5B=0;
      IF QN5C=. THEN QN5C=0;
      IF QN5D=. THEN QN5D=0;
      IF QN5E=. THEN QN5E=0;

      MULTRACETESTVAR=QN5A + QN5B + QN5C + QN5D + QN5E;
      IF HISP=1 THEN RACE=3; /*hispanic*/
      ELSE IF MULTRACETESTVAR>1 THEN RACE=4; /*NH multi/other*/
      ELSE IF (QN5A=1 OR QN5B=1 OR QN5D=1)THEN RACE=4; /*NH other/multi*/
      ELSE IF QN5C=1 THEN RACE=2; /*NH BLACK*/
      ELSE IF QN5E=1 THEN RACE=1; /*NH WHITE*/
RUN;

PROC FREQ DATA=sa;
      TABLES MULTRACETESTVAR RACE*(MULTRACETESTVAR HISP QN5A QN5B QN5C QN5D
QN5E)/ MISSING;
RUN;
/*SUCCESS!*/


*Create the final dataset to work with with simplified variable names;
DATA sa;
      SET sa;
      BELIEF=qn72gbeliefNEW;
      ECIG30=CELCIGT_RuseNEW; /*outcome*/
/*    QUIT30                              */
/*    PASTQUIT                      confounder*/
/*    AGEGROUP                      confounder*/
/*    RACE                          confounder*/
/*    SEX                                confounder*/
RUN;

*Confine all vars to inclusion criteria;
DATA sa;
      SET sa;
      IF INCLUDE1=2 THEN QUIT30=.;
```

```
      IF INCLUDE1=2 THEN PASTQUIT=.;
      IF INCLUDE1=2 THEN AGEGROUP=.;
      IF INCLUDE1=2 THEN RACE=.;
      IF INCLUDE1=2 THEN SEX=.;

      /* IF QN53=1  ::  non smokers, classified by response to the pre-recode
exposure var*/

      IF QN53=1 THEN BELIEF=.;
      IF QN53=1 THEN ECIG30=.;
      IF QN53=1 THEN PASTQUIT=.;
      IF QN53=1 THEN AGEGROUP=.;
      IF QN53=1 THEN RACE=.;
      IF QN53=1 THEN SEX=.;
RUN;

PROC FREQ DATA=sa;
      TABLES INCLUDE1*(ECIG30 QUIT30 PASTQUIT AGEGROUP RACE SEX) QN53*(BELIEF
QUIT30 PASTQUIT AGEGROUP RACE SEX) / MISSING;
RUN;

*No interaction term;
PROC SURVEYLOGISTIC DATA=sa;
      title       'Sensitivity Analysis 3 - Multivariate - No interaction
term';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=LAST) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 PASTQUIT AGEGROUP RACE SEX ;
RUN;


*Interaction term;
PROC SURVEYLOGISTIC DATA=sa;
      TITLE       'Sensitivity Analysis 3 - Interaction Multivariate';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 BELIEF*QUIT30 PASTQUIT AGEGROUP RACE SEX
;
RUN;
```

```
*Stratified;
PROC SURVEYLOGISTIC DATA=sa;
      TITLE       'Sensitivity Analysis 3 - Stratified by quit30';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      domain      quit30;
      CLASS       BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  PASTQUIT  (REF=LAST) /*has not tried to quit*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF PASTQUIT AGEGROUP RACE SEX ;
RUN;

*View the pattern of inconsistent cases that are being included;
proc print data=sa;
      where qn35iheard not = 1 and (belief=1 or ecig30=1);
      var qn35iheard belief EELCIGT_Rtried ecig30;
run;


*****************************************Sensitivity Analysis 4: Remove
Intent to Quit Var***********************

*No interaction term;
PROC SURVEYLOGISTIC DATA=TS;
      title       'Sensitivity Analysis 4 - No Pastquit - Multivariate';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  AGEGROUP (REF=LAST) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 AGEGROUP RACE SEX ;
RUN;

*Interaction;
PROC SURVEYLOGISTIC DATA=TS;
      title       'Sensitivity Analysis 4 - No Pastquit - Interaction';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      CLASS       QUIT30 (REF=LAST) /*does not intend to quit within 30
days*/
                  BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  AGEGROUP (REF=LAST) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF QUIT30 AGEGROUP RACE SEX BELIEF*QUIT30;
```

```
RUN;

*Stratified by belief;
PROC SURVEYLOGISTIC DATA=TS;
      TITLE       'Sensitivity Analysis 4 - No Pastquit - Stratified by
quit30';
      strata  STRATUM;
      cluster PSU;
      weight  WT;
      domain      quit30;
      CLASS       BELIEF (REF=LAST) /*does not believe e-cigs safer*/
                  AGEGROUP (REF=last) /*18+*/
                  SEX (REF=LAST) /*female*/
                  RACE (REF=FIRST) /*NH white*/
                  / PARAM=REF;
      MODEL ECIG30  = BELIEF AGEGROUP RACE SEX ;
RUN;



*************************************************************************
************************
                                    Rotating reference categories for
pairwise p value comparisons
*************************************************************************
************************;
*Create 4-group categorical variable capturing both belief and intent to quit
binary variables;
DATA TS;
      SET TS;
      IF QUIT30=1 AND BELIEF=1 THEN GROUP=1;
            /*wants to quit, believes safer*/
      ELSE IF QUIT30=2 AND BELIEF=1 THEN GROUP=2;
            /*doesn't want to quit, believes safer*/
      ELSE IF QUIT30=1 AND BELIEF=2 THEN GROUP=3;
            /*wants to quit, doesn't believe safer*/
      ELSE IF QUIT30=2 AND BELIEF=2 THEN GROUP=4;
            /*doesn't want to quit, doesn't believe safer*/
      ELSE GROUP=.;
RUN;
*Create alternative 4-group caterogical variables to easily run logistic
regression series with rotating reference categories (ref=last);
DATA TS;
      SET TS;

      IF GROUP=2 THEN GROUP2=5;
            /*category #2 - doesn't want to quit, believes safer = ref*/
      ELSE GROUP2=GROUP;

      IF GROUP=3 THEN GROUP3=5;
            /*category #3 - wants to quit, doesn't believe safer = ref*/
      ELSE GROUP3=GROUP;
RUN;
/*check recode*/
PROC FREQ DATA=TS;
      TABLES BELIEF*(GROUP GROUP2 GROUP3) QUIT30*(GROUP GROUP2 GROUP3) /
MISSING;
```

```
RUN;

*Run regression with 4 groups to compare values across strata;
PROC SURVEYLOGISTIC DATA=TS;
      title 'Multivariate - 4 group variable - doesn't want to quit, doesn't
believe safer = REF ';
      strata STRATUM;
      cluster PSU;
      weight WT;
      CLASS GROUP (REF=LAST) /*doesn't want to quit, doesn't believe safer*/
            PASTQUIT (REF=LAST) /*has not tried to quit*/
            AGEGROUP (REF=LAST) /*18+*/
            SEX (REF=LAST) /*female*/
            RACE (REF=FIRST) /*NH white*/
            / PARAM=REF;
      MODEL ECIG30 = GROUP PASTQUIT AGEGROUP RACE SEX ;
RUN;
PROC SURVEYLOGISTIC DATA=TS;
      title 'Multivariate - 4 group variable - doesn't want to quit, believes
safer = REF ';
      strata STRATUM;
      cluster PSU;
      weight WT;
      CLASS GROUP2 (REF=LAST) /*doesn't want to quit, believes safer*/
            PASTQUIT (REF=LAST) /*has not tried to quit*/
            AGEGROUP (REF=LAST) /*18+*/
            SEX (REF=LAST) /*female*/
            RACE (REF=FIRST) /*NH white*/
            / PARAM=REF;
      MODEL ECIG30 = GROUP2 PASTQUIT AGEGROUP RACE SEX ;
RUN;
PROC SURVEYLOGISTIC DATA=TS;
      title 'Multivariate - 4 group variable - 'wants to quit, doesn't
believe safer' = REF ';
      strata STRATUM;
      cluster PSU;
      weight WT;
      CLASS GROUP3 (REF=LAST) /*wants to quit, doesn't believe safer*/
            PASTQUIT (REF=LAST) /*has not tried to quit*/
            AGEGROUP (REF=LAST) /*18+*/
            SEX (REF=LAST) /*female*/
            RACE (REF=FIRST) /*NH white*/
            / PARAM=REF;
      MODEL ECIG30 = GROUP3 PASTQUIT AGEGROUP RACE SEX ;
RUN;



****************************************  end of analysis
****************************************;
```

EPI 752-Data Management
May 18, 2015

	Points Allowed	Draft comments	Final paper comments	Grade
OVERALL	I think the paper is very interesting and worth publishing, although a fair amount of work would be needed to get it into shape. Some possible journals to consider are JAMA Pediatrics or Pediatrics (a stretch but might be worth a first attempt), or Journal of Adolescent Health or Journal of interpersonal violence			
Introduction	20	Good, but you need to include more justification about the variables you are examining (i.e. source of birth control) in your introduction, expand on the literature that looked at similar associations, and justify your choice of confounders. Some of those confounders seem more like results of IPV (e.g. suicide, unsafe sex) rather than causes of IPV so some explanation in the introduction would help the reader understand your thinking.	The introduction probably needs to be shortened a bit. Also, I am still not convinced that some of your confounders are causes of IPV and not consequences of IPV (i.e. suicide). You might also talk a bit about the increased risk of IPV sexual minorities have.	18
Methods	20	Some reorganization of the measures section is needed.	The measures section still needs to be reorders as suggested on the	16

		Describe the outcome first, then all the exposures, and final the confounders.	draft.	
Results	20	You need to present the %s for the description of table 1 results. Table 1 should have row percents for the association by IPV, not column percents. For all regression models (1) present the crude associations unstratified (2) present the multivariate results unstratified (3) state what the interaction p-values were and if significant, then (4) present the stratified results. When the association is not significant, you need only say that and do not need to give details about the OR and CI in the text.	For the text describing table 1, I would suggest first describing the population overall, then describing the significant associations with IPV. You want to emphasize the increased risk sexual minorities have as I think that is a focal point. The sensitivity analysis results section is too long. Just say you reanalyzed the data in the various different ways and that the associations were essentially the same with the exceptions of … Add to table 1 the description of (n, %) participants	18

			reporting sexual IPV and physical IPV so the reader can see the numbers which will help with the interpretation of the sensitivity analysis results. For the publication, you might add the sensitivity analyses to your tables 2-5.	
Discussion	20	A bit more thorough discussion is needed. Discuss all your exposures, not just grade of sex ed. Expand on the PH implications and suggestions for future research.	Good, but maybe emphasize the increased risk of IPV among sexual minority youth. Also, do schools usually only offer birth control education in one year and it is up to the school to decide when? I recall having sex ed in 7th grade and then nothing after that, but that was a long time ago so I wonder if now sex ed is	19

			taught every year or only once. If only once, then your findings certainly are important and suggest, I think, that while sex ed early is important it should probably be retaught at a later grade as well when students are more set in their sexual identity and orientation and when more are sexually active.	
Other (endnote codes, grammar, etc.)	20	Yes	Good	
GRADE				91%

Access to School-Based Sexual Health Resources for Sexual Minority Youths and Adolescent Intimate Partner Violence

Introduction

Adolescent intimate partner violence (IPV) is a prevalent health issue ~~affecting adolescents~~. In the 2013 New York City Youth Risk Behavior Survey (YRBS), approximately 12.6% and 13.0% of those who had dated in the past 12 months reported experiencing physical IPV or sexual IPV respectively. Studies that include psychological IPV suggest that the prevalence of IPV is much higher, affecting as many as 40-60% of teens.[1-3] Adolescent IPV can have lasting and serious consequences on future health outcomes.[4-9]

Intimate Partner Violence and Successful Interventions

The growing body of literature focusing on adolescent IPV demonstrates an association with ~~sexual risk~~ negative health behaviors,[10,11] including inconsistent condom use or coerced unprotected sex,[11-15] unprotected vaginal and anal sex, coerced sexual risk behavior, fear of requesting condoms or refusing sex,[11,12,15] mental health diagnoses and suicidality,[5,6,7,16-19] substance use/abuse,[5,8,11,16,17,20] community or school-based violence,[14,17,21-23] and peer influences.[16,17,23,24] Although the majority of research on these factors has been cross-sectional, there is longitudinal evidence showing early adolescent exposure to multiple sex partners,[13] community violence,[14] alcohol use,[14,16,17] marijuana use,[16] depression,[16,17] anxiety,[16,17] bullying victimization[16,20] or perpetration,[17] is significantly associated with later IPV victimization or ~~perpetration. Although causal direction is not firmly established, the~~perpetration. The factors associated with adolescent IPV are complex~~ly~~ inter-related[6,15] and fit into a social determinants of health paradigm.[25]

Commented [f1]: Not really health behaviors so maybe delete

Commented [f2]: It is unclear from this which is the cause and which the outcome

Commented [f3]: Which is?

Research on the efficacy of interventions to prevent or reduce adolescent IPV is limited, with a recent systematic review only identifying six randomized-controlled trials (RCTs) conducted through the end of 2013.[26] Among these six trials, five were school-based and those in the intervention arms of three trials reported less perpetration of IPV than those in the control arms.[26] Of successful, school-based studies, the only type of intervention found to have no impact on reports of IPV was that which was exclusively limited to the classroom, and did not include a structural, school-wide approach,[26] an approach that yielded significant results as a protective factor against IPV in one RCT and was recommended by the authors of two other studeies.[27-29] Earlier intervention is recommended as the prevalence of adolescent IPV is high for middle school students[7,13,29,30] and programs such as the Start Strong initiative, which focused on middle-school students, found significant decreases in factors thought to be interim outcomes on the pathway between successful interventions and IPV perpetration and victimization, such as gender stereotypes and acceptance of IPV.[30] School-based providers may be the first adults to whom adolescents disclose IPV[31,32] and if they are prepared to intervene, these providers can offer effective clinician-administered intervention[32,33] or can contribute to a systems approach within the institution.[34] A cluster randomized control trial found that the implementation of the School Health Center Healthy Adolescent Relationships Program (SHARP) in routine school health center visits was an effective intervention for addressing adolescent IPV.[32] Intensity-adjusted intervention effects were associated with increased knowledge of IPV resources and increased self-efficacy to use harm reduction strategies among intervention participants compared with controls.[32]

Structural Barriers to Sexual Health Education Access

Commented [f4]: So the studies looked at perpetrators not victim?

Commented [f5]: reword

School-based sexual education is not yet universal in New York City, and birth control education is one of the curriculum topics ~~that~~ from which parents may opt their children out ~~of~~. The 2013 New York City YRBS shows a significant number of students (n=2,338) reporting that they have never received classroom education on birth control methods. However, relationship management is a mandatory component of the now required semester of comprehensive sexual health education for New York City middle and high school students.[35] Thus these classes may provide education about IPV. Historically, New York City public schools have exhibited high levels of fragmentation and inconsistency in the provision of sexual health education.[36,37] Prior to the universal mandate in 2013, the availability of sexual health education in a school was largely determined by individual principals and school district budgets.[37] Although a comprehensive, city-wide evaluation of the state of sexual health education in New York City public schools has never been ~~done~~ conducted~~to assess the population-level causes of access to sexual health education in certain public schools~~, city and state grant-making patterns suggest that those schools with the fewest financial resources are the schools with the highest need for comprehensive health education.[36-38] We hypothesize that the same poverty-related health outcomes and risk behaviors that create a need for comprehensive health education are likely to impact students' school attendance and the ability of school administrators to dedicate resources towards sexual health education. Less healthy students are more likely to be struggling with basic academic requirements and without universal standards, sexual health education may be viewed as a luxury in many school districts.[37] Although indicators of poverty were not gathered in the 2013 YRBS dataset, poverty and lack of resources are known determinants of poor health and risk behaviors[25,39-42] and we hypothesize that several health and social conditions associated with poverty and with IPV, including mental health, bullying, risky sexual behavior, and

substance use, are also likely to be associated with the provision of sexual health education in schools, both in classrooms and by school-based clinicians providing both reproductive and non-reproductive care.

School-based health centers (SBHCs) provide primary care to students of all ages with parental consent and reproductive health services to high school students with student consent.[43] These health centers may also offer psychosocial services and thus provide services to help students experiencing or at risk for IPV. SBHCs are primarily located in areas with limited access to health care services[43] and are also not universal in New York City schools. As federally designated medically underserved areas are selected by criteria of poverty, limited access to healthcare providers and services, and population-level health indicators,[44] we hypothesize that several health conditions associated with poverty and IPV are also likely to be associated with access and use of SBHCs, such as mental health, bullying, risky sexual behavior, and substance use. A significant number of students (n=1,049) report not having an SBHC in their school.[43]

Studies assessing the effectiveness of IPV interventions have largely focused on interventions designed to target IPV, rather than on the effects of comprehensive sexual health education and services. To date, there have been no studies looking at the association between ~~age or grade~~timing of introduction to school-based sexual health education or school-based birth control encounters and adolescent IPV.

We hypothesized that earlier school-based health education on birth control methods ~~will~~ would be negatively associated with adolescent IPV, both due to the dialogue regarding sex and the negotiation, decision making, and communication skills regarding birth control (including condom) use taught in the approved NYC curricula on birth control.[36] We also hypothesize that to the presence of and use of school-based health resources and clinicians will be negatively

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associated with adolescent IPV, as has been shown in previous studies.[31,32,34] If students are not only using the SBHC resources, but also obtaining their birth control from a school-based source, we hypothesize that this will be negatively associated with IPV as there is a one-on-one educational opportunity between the student seeking birth control and the SBHC clinician or health educator for important topics surrounding birth control use, including birth control negotiation, that would not be available from other sources, such as bodegas or pharmacies. Previous studies show brief interventions by clinicians are effective at identifying adolescent IPV, regardless of the nature of the clinic visit.[45,46] As sexual minority youths are exceptionally vulnerable to IPV victimization[47-49] and since most school-based sexual health resources are designed for heterosexual students and the sexual health needs of sexual minority youth are often unaddressed,[50,51] we hypothesize that the effect of earlier birth control education and of the presence and use of a SBHC, including for birth control access, will be modified by sexual minority identity.

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Methods

Data Collection

The 2013 New York City YRBS is a publicly available data set that was used for this analysis. The study consists of a cross-sectional survey among high school students in New York City. Participants were selected using a stratified, two-stage cluster sampling process that was designed to produce a representative sample of students.[52] In the first stage, schools, which are the Primary Sampling Units, were randomly selected with probability proportional to the schools' enrollment sizes.[52] Classes were then randomly selected and all students in the class were eligible to participate.[52] Data collection, data management and ethical oversight for the YRBS[53] and New York City's sampling methodology have been previously described.[52,54]

Previous studies have extensively examined the reliability and validity of the survey items.[55,56] The self-administered, anonymous survey was completed by selected students who were in attendance on the day of the survey.[52] ELS and special education students were excluded from the survey.[52] One week before the survey was conducted, parents were sent a letter with an opt-out form should they not want their child to participate in the survey.[52] The 2013 New York City YRBS collected surveys from 9,439 students from 81 public high schools, with a school response rate of 89%, a student response rate of 79%, and an overall response rate of 71%.[52]

Measures

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We dichotomized sexual identity into an indicator for having a sexual minority identity, which included those who identified as lesbian, gay, or bisexual, versus those who did not including those who were unsure. We included those who identified as being unsure in the non-sexual minority group because we did not have sufficient power to examine them as a separate group as has been done previously.[57]

The primary exposure variable in this analysis was classroom instruction on birth control methods. Participants were asked, "In what grade were you when a teacher first taught a class about birth control methods such as the Pill, the ring, IUDs, birth control shots, patches, or condoms?" Response options were "I have never been taught a class by a teacher about birth control methods", and options for six grade level starting at"6th grade or earlier" up to "11th or 12th grade." Participants could also respond "Not sure," which was recoded as missing. These categories were collapsed into three grade level options, "7th grade or earlier", "8th grade or 9th grade", and "10th, 11th or 12th grade". Never having classroom instruction on birth control methods was used as the reference category for each of the 3 grade-categories.

Several potential confounders were assessed individually for the inclusion in the final model using the 10% change in beta criterion. We did not have sufficient power to examine race as a polytomous variable. We chose instead to examine Latino ethnicity rather than race, as has been done previously with the YRBS because the NYC YRBS oversamples Latinos and Latinos constitute the largest minority group in New York City.[57] Latino or Hispanic ethnicity was established by an affirmative answer to "Are you Hispanic or Latino?" Gender was included with male as the reference category. We chose to use suicidal thoughts or attempts, use of marijuana or alcohol in the past month, multiple sex partners, condom use, and bullying as confounders based on the literature that shows mental health, substance use/abuse, risky sexual behavior, and bullying as associated with both IPV and with poverty, the hypothesized distal cause of access to health education. We created a dichotomous indicator for any suicidal thoughts or attempts was based on the questions "During the past 12 months, did you ever seriously consider attempting suicide?" and "During the past 12 months, how many times did you actually attempt suicide?" We examined substance use (alcohol and marijuana) in the past month. We created a dichotomous indicator based on the questions, "During the past 30 days, on how many days did you have at least one drink of alcohol?" and "During the past 30 days, how many times did you use marijuana?" We created a dichotomous indicator for multiple sex partners based on the questions, "During your life, with how many people have you had sexual intercourse?" and "During the past 3 months, with how many people did you have sexual intercourse?" If a student had sex with more than four partners in their lifetime or more than one partner in the past three months, we considered them to have multiple sexual partners, based on the dichotomization of these questions into "Yes/No" questions in the 2013 YRBS codebook. We created a dichotomous indicator for always using condoms among students who reported having sex in the past three

months based on the question, “During the past three months, how often did you or your partner use a condom when you had sexual intercourse?” We created a dichotomous indicator for any bullying based on the questions, “During the past 12 months, have you ever been bullied on school property?” and “During the past 12 months, have you ever been electronically bullied?”

The secondary exposure variables were access to and use of a school-based health center (SBHC). Students responding either “Yes” or “No” to the question: “Have you ever used the school-based health center (school clinic) at your school?” were combined and considered to have access to an SBHC, while students who responded, “My school does not have a school-based health center” were categorized as not having access to an SBHC. To determine use of the SBHC, those who responded “Yes” had used the SBHC and those who responded “No” had not used the SBHC. Those who responded, “My school does not have a school-based health center” were excluded from the variable of SBHC use. The primary analysis conducted on this variable compared those with access to SBHCs to those without access, with not having an SBHC as the reference category. A second analysis was conducted to assess if, among those with access to an SBHC, use of the SBHC was associated with IPV, with non-use of the SBHC as the reference category.

We also looked at source of birth control as an exposure based on response to the question “The last time you used birth control, including condoms, from where did you or your partner get it?” We created a dichotomous variable among students having used birth control to differentiate between those students responding “School-based health center or somewhere else in school” and the other response options, “Community-based clinic or hospital”, “Pharmacy”, “Bodega or botanica”, “Someplace else” and “Not sure”, with receiving birth control outside of

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school as the reference category. This variable was only analyzed among those participants who reported ever using birth control.

The physical IPV outcome variable was determined by response to the question, “During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose?” The sexual IPV outcome variable was determined by response to the question, “During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do?” Both outcomes had six response options, “I did not date or go out with anyone during the past 12 months”, “0 times”, “1 time”, “2 or 3 times”, “4 or 5 times” and “6 or more times”. Both variables were collapsed to be dichotomous variables comparing having experienced any IPV in the last 12 months to no IPV experienced in the last 12 months. Those with no date in the past 12 months were included in the no IPV category. We looked at physical and sexual IPV separately and we created an indicator for any IPV for those who had experiences physical and/or sexual IPV, which was considered the primary outcome.

Statistical analysis

We describe the distribution of all the variables of interest for the total sample and then separately for those participants who experienced any IPV (physical or sexual) and those who did not. We conducted chi square tests to assess statistical significance when examining association of a categorical variable with IPV. We then used crude and adjusted logistic regression models to examine the association between IPV and (1) grade at first classroom instruction on birth control methods, (2) presence of a school-based health center (3) among those with a school-based health clinic, use of that clinic, and (4) received last birth control method form a school-based health clinic. Potential confounders and covariates were chosen

based on the literature and included in the final multivariate model if a change in beta greater than 10% is observed for one of the primary exposures of~~a~~ interest when the potential confounder was added to the crude model. To explore the possibility that association of school-based sexual education and services with IPV is modified by asexual minority identity, we added an interaction term for sexual minority identity times each of the exposure variable in the final adjusted models. If an interaction term was significant, we then stratified on sexual minority identity.

All statistical tests were 2-sided with a P-value <0.05 for rejection of the null hypothesis. All analyses were conducted using SAS version 9.2 (Cary, NC), took the sample design into account and used the YRBS sample weight to weight the results to the population of New York City high school students.

Results

Table 1 presents selected descriptive statistics for the 2013 NYC high school population overall and by experience of intimate partner violence. Sexual minority youths represented 10% of the population and identifying as a sexual minority was significantly associated with IPV victimization (p<.0001), with 27.8% of sexual minority youths reporting IPV compared with 15.9% of non-sexual minority youths. Females represented 49.2% of the population and gender was not significantly associated with IPV (p=0.8811). Those identifying as Hispanic/Latino represented 37.6% of the population and ethnicity was not significantly associated with IPV (p=0.59). For grade of first birth control education, 31.2% of the population had never received education on birth control methods, 33.1% had received it in seventh grade or earlier, 28.2% had received it in eighth or ninth grade, and 7.4% had received it in tenth, eleventh, or twelfth grade. Grade of first birth control education was not significantly associated with IPV (p=0.3141). Ever

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users of birth control constituted 22.5% of the population and was significantly associated with IPV (p<.0001), with 24.7% of ever users reporting any IPV compared with 13.7% of never users. Those with access to an SBHC were 85% of the population and SBHC access was significantly associated with IPV among those with SBHC access (p<.0001), with 15.9% of those with SBHC access reporting IPV compared with 25% of those without SBHC access. SBHC use among those with SBHC access was 35% and was not significantly associated with IPV (p=0.1649). Overall, 18.3% of the population reported suicidal thoughts or attempts and suicidal thoughts or attempts was significantly associated with IPV (p<.0001), with 38.5% of those reporting suicidal thoughts or attempts also reporting IPV, compared with 12.4% of those who had not reported suicidal thoughts or attempts. Alcohol or marijuana was used by 31.7% of the population in the past month and was significantly associated with IPV (p<.0001), with 25.5% of substance users reporting IPV compared with 10.1% of non-users. Those who reported having multiple sex partners were 11.2% of the population and having multiple sex partners was significantly associated with IPV (p<.0001), with 31.1% of those with multiple sex partners reporting IPV, compared to 11.5% among those who were not categorized as having multiple sex partners. Always condom use was reported by 48.7% of the population and was significantly associated with IPV (p<.0001), with 17.8% of those always using condoms reporting IPV compared with 30% of those not always using condoms. Bullying (cyber or in person) affected 18.7% of the population and was significantly associated with IPV (p<.0001), with 35.5% of those who were bullied also reporting IPV, compared with 12.6% of those who were not bullied.

Logistic Regression Models for Birth Control Education

There were no statistically significant associations in the univariate or multivariate models between grade of first birth control education and any IPV. The interaction term between sexual minority identity and receiving birth control education in seventh grade or earlier (p=0.0258) and in tenth, eleventh, or twelfth grade (p=0.0115) was significant at the 0.05 level. The interaction term between sexual minority identity and birth control education in eighth or ninth grade was not significant at the 0.05 level (p=0.4117). We therefore stratified the birth control education analysis by sexual minority identity. The association between grade of first sexual education and IPV showed a dose response among sexual minority youth, with an increasing protective effect as grade increased. In the multivariate model for the sexual minority youth strata, participants in the category for earliest birth control education had 0.152 times the odds of IPV victimization as those who did not receive any birth control education (95% CI 0.026-0.896), while participants receiving birth control education in eighth or ninth grade had 0.125 times the odds of experiencing IPV (95% CI 0.017-0.942), and participants receiving birth control education in the latest grade category had 0.017 times the odds of IPV victimization as those who received no birth control education (95% CI 0.001-0.225). Among non-sexual minority youth, there was no significant association between grade of first sexual education and IPV.

Logistic Regression Models for Access to a School-Based Health Center

The interaction term between access to an SBHC and sexual minority identity was not significant at the 0.05 level (p=0.9541), therefore we did not stratify the analysis between IPV victimization and access to an SBHC. In the univariate logistic regression, those with access to SBHCs had 0.525 times the odds of experiencing IPV as those without access to SBHCs (95% CI 0.393-0.701). There was no significant association between SBHC access and IPV

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victimization in the multivariate logistic regression. Among those with access to a SBHC, the ~~interaction term between use of SBHCs and sexual minority identity was not significant at the 0.05 level (p=0.8258), therefore we did not stratify the analysis between IPV victimization and SBHC use. The~~ association between SBHC use and IPV victimization was not significant in the univariate or multivariate logistic regression models. The interaction term between use of SBHCs and sexual minority identity was not significant at the 0.05 level (p=0.8258).

Logistic Regression Models for Birth Control Access

There was no significant association in the univariate or multivariate logistic regression between accessing birth control at school and IPV victimization. The interaction term between accessing birth control at school and sexual minority identity among ever birth control users was not significant at the 0.05 level (p=0.5628), therefore we did not stratify the analysis between IPV victimization and accessing birth control at school.

Sensitivity Analyses

In order to determine if there important differences between the two combined outcomes, physical IPV and sexual IPV, we conducted all of the above analyses separately for each outcome. There was no significant interaction observed between sexual minority identity and receiving birth control education in seventh grade or earlier (p=0.6264), in eighth or ninth grade (p=0.7347), or tenth grade or later (p=0.0578) for sexual IPV. Those receiving birth control education in seventh grade or earlier, eighth or ninth grade, and tenth grade had 0.609, 0.705, and 0.549 times the odds respectively of IPV victimization as those who received no birth control education, although none of these effects were significant (95% CI 0.294-1.262, 95% CI 0.368-1.353, 95% CI 0.157-1.925). There was significant interaction for physical IPV between sexual

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minority identity and receiving birth control education in seventh grade or earlier (p=0.0258) and in tenth grade or later (p=0.0115), but not for eighth or ninth grade (p=0.4117). Among sexual minority youth, those receiving birth control education in seventh grade or earlier had 0.122 times the odds and those receiving birth control education in tenth grade or later had 0.026 times the odds of physical IPV as those not receiving any birth control education (95% CI 0.025-0.598 and 0.002-0.387). Those who received birth control education in eighth or ninth grade had 0.243 times the odds of physical IPV victimization as those not receiving birth control education (95% CI 0.044-1.353). The interaction terms between sexual IPV and SBHC access, between sexual IPV and SBHC use, and between sexual IPV and receiving birth control from school were not statistically significant. There was no significant association between SBHC access and sexual IPV victimization, between SBHC use and sexual IPV victimization, or between accessing birth control at school and sexual IPV victimization. The interaction terms between physical IPV and SBHC access, between physical IPV and SBHC use, and between physical IPV and receiving birth control from school were not statistically significant. There was no significant association between SBHC access and physical IPV victimization, between SBHC use and physical IPV victimization, or between accessing birth control at school and physical IPV.

We categorized those responding “Not sure” about their sexual orientation with sexual minority youth instead of with their heterosexual peers as an alternative model. We also tried coding them as missing. When those who were unsure were categorized with sexual minority youth, the association between any IPV and grade of first birth control education was not statistically significant in the multivariate regression. The interaction term only remained significant between sexual minority youth and receiving birth control education in grades ten through twelve when those who were not sure were included with sexual minority youth

(p=0.0072) and when they were excluded (p=0.0107). When stratified, among sexual minority youth including those who were not sure, only receiving birth control education in grades ten through twelve remained significantly protective. Those who received birth control education in grades ten through twelve had 0.039 times the odds of those who never received birth control education (95% CI 0.005-0.294). When stratified, among sexually minority youth with those who were not insured excluded from the model, all three grade categories were significantly protective. Those who received birth control education in seventh grade or earlier had 0.152 times the odds of those who never received birth control education (95% CI 0.026-0.896), those who received birth control education in eighth or ninth grade had 0.125 times the odds of those who never received birth control education (95% CI 0.017-0.942), and those who received birth control education in grades ten through twelve had 0.017 times the odds of those who had never received birth control education (95% CI 0.001-0.225). Among non-sexual minority youth, there was no significant association between any IPV and grade of first birth control education when those who were not sure were included with sexual minority youth or when they were excluded.

The interaction term between SBHC access and sexual minority identity, including those who were not sure, remained insignificant at the 0.05 level (p=0.5340). When those who were not sure were excluded, the interaction term remained insignificant (p=0.9573). The association between SBHC access and any IPV in the multivariate analysis was also not significant when those who were not sure were included with sexual minority youth, although the p-value for SBHC access did diminish slightly and came very close to being significant, from 0.0549 to 0.0507. When those who were not sure were excluded in the multivariate regression, the association between SBHC access and IPV was not significant. The interaction term between SBHC use and sexual minority identity, including those who were not sure, remained

insignificant at the 0.05 level (p=0.1569). When those who were not sure were excluded, the interaction term remained insignificant (p=0.8427). The association between SBHC use and any IPV in the multivariate analysis was also not significant when those who were not sure were included with sexual minority youth and when those who were not sure were excluded.

The interaction term between receiving birth control at school and sexual minority identity, including those who were not sure, remained insignificant at 0.05 level (p=0.8433). When those who were not sure were excluded, the interaction term remained insignificant (p=0.6064). The association between receiving birth control and any IPV in the multivariate analysis was also not significant when those who were not sure were included with sexual minority youth or excluded entirely.

Discussion

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We believe this study to be one of the first to examine how sexual minority identities may modify the relationship between sexual health education and IPV victimization. These results show that health education addressing birth control methods may impact IPV among youths identifying as sexual minorities differently than their non-sexual minority peers. Specifically, health education addressing birth control methods may have greater protective effects for sexual minority youths than for non-sexual minority youths and the association increased for education given at first in later grades. This is in contrast to our hypothesis that earlier sexual education would have a stronger protective effect. It is possible that sexual health education is less relevant for younger students who have not yet initiated sexual intercourse and for younger sexual minority youth individuals, their identities have not yet solidified at a younger age. It is also important to note that birth control education is a broad term, encompassing not only hormonal methods of birth control to prevent unwanted pregnancy, but condoms, abstinence, and the

negotiations regarding the use of birth control as well. While exclusively same-sex partnerships are not at risk for becoming pregnant, not all who identify as gay or lesbian have only ever had sexual contact with the same gender. Women who identify as lesbian have been found to have been at higher risk for teen pregnancy than their heterosexual counterparts and providers of reproductive health care and family planning services should not assume that pregnant teenagers are heterosexual or that adolescents who say they are bisexual, lesbian or unsure of their sexual orientation are not in need of family planning counseling.[58] Sexual minority youth also includes those who identify as bisexual and individuals of trans experience who also identify as gay or lesbian, both of whom may be at risk for unwanted pregnancy.

Also contrary to our hypothesis, we found a strong protective effect of birth control education seen for sexual minority youth but not sexual non-minority youth. Considering that most sexual health education is not tailored to the unique needs of sexual minority youth in spite of the fact that those youths are at increased risk for sexual health outcomes,[51] it was expected that education on birth control methods would confer a more protective association on non-sexual minority youths compared to their sexual minority peers. However, there is very limited research on the impacts of sexual health education and resources for sexual minority youths.[50]

Our result for the protective effect of SBHC access was only statistically significant in the univariate analysis. It is likely that there is unmeasured confounding by neighborhood level socioeconomic status, although without additional information on the distribution and characteristics of school-based health centers in New York City public schools, it cannot be conclusively determined. Use of SBHC was not significant in the univariate or the multivariate analysis, however the direction of the association changed from a positive association in the univariate model to a negative association in the multivariate model, when the effects of related

health conditions were controlled. There is likely additional unmeasured confounding for parental involvement or support, which has been shown to be related to the covariates in the model as well as to IPV,[6,23,25,39,41] but like SES, was not asked in the YRBS survey. Only one RCT known to date has tested the ability of SBHCs to effectively intervene and address adolescent IPV.[32] Although obtaining birth control from school was negatively associated with IPV, as was hypothesized, this result was not statistically significant. As previous studies have demonstrated, there is an opportunity to integrate brief IPV screening into all clinical visits in order to identify adolescent IPV[31,45,46] and the effectiveness of brief screening programs should be explored in New York City SBHCs.

This study has several limitations. Most importantly, cross-sectional studies do not allow for the inference of causal relationships or temporal order. All measures used were self-report and were based on a survey that parents were allowed to opt out on behalf of their children. As parents may also opt out on behalf of their children for sexual health education lessons pertaining to birth control methods, it may be that those youths who were opted out of survey participation differ in important ways from those youths who were not opted out, especially on topics pertaining to birth control. Prior to the mandate in 2013 that a semester of comprehensive sexual health education was required for all middle and high school students, students' health education was varied and depended greatly on the school's individual principal.[59] Therefore, the primary exposure measure is also likely to be extremely varied and not uniform. The sensitivity analysis showed a difference between sexual minority youths and non-sexual minority youths only for the combined IPV measure and the physical IPV measure. If birth control education were truly associated with reduced IPV, we would expect to see consistency in these results across all IPV outcomes.

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We did not have sufficient power to analyze sexual minority identity as a polytomous variable, and for the primary analysis, we categorized those who were unsure or questioning their sexual identity with their peers who identified as heterosexual. The sensitivity analyses, in which those who were not sure were included with sexual minority youth as well as excluded from the model altogether, only showed differences with the grade of first birth control as the exposure. When those who were not sure were included with sexual minority youth, the protective effect was only seen for receiving birth control education in grades ten through twelve. Including those who were not sure with heterosexual peers or with their sexual minority peers may have caused some heterogeneity within sexual identity categories. Future research focused on sexual minority youths should ensure sufficient power for differing sexual minority identities to ensure homogeneity within categories and to be better positioned for causal inference. Due to the nature of the study, only youths who were enrolled in the New York City school system were included. This excludes important populations, such as high school dropouts, incarcerated, homeless, or runaway youths, which may have threatened the external validity of the study. Sexual minority youths are more likely to be homeless,[60] which may compromise the generalizability of this study. Also, youths in NYC public schools may be different from NYC youths in private schools, youths in other parts of the nation, or in other countries, especially rural areas. The main outcome variable, physical or sexual IPV, does not include emotional or verbal IPV. As our sensitivity analyses of physical and sexual IPV as separate outcomes yielded different results from the combined measure, verbal and emotional IPV may also be different. It is expected that there is uncontrolled confounding for socioeconomic status, especially neighborhood or school district-level socioeconomic status, which ~~is~~ may be an important determinant in sexual health

education. Although this variable has been included in the YRBS prior to 2013, it was not available for analysis in this dataset.

If future research on this topic corroborates the findings of the present study in spite of these limitations, there may be an important opportunity to address intimate partner violence among sexual minority youth with sexual health education, including education on birth control topics. Adolescent IPV can have lasting and serious consequences on future health outcomes, including increased sexual risk and teen pregnancy,[4,5] higher risk of mental health diagnoses[6,7] and suicidality,[5] substance use/abuse,[5,8] future perpetration or victimization of IPV in adulthood,[7,9] unhealthy weight control behaviors,[5] and significantly poorer physical health into adulthood.[6] As disparities for IPV persist for sexual minority individuals,[47,48] classroom based sexual health education may provide a realistic and feasible possibility to begin to address those disparities early on, while healthy behaviors and attitudes are still forming. Future studies should assess the characteristics, distribution, and services of school-based health centers in New York City and their efficacy in addressing IPV and multiple conditions inter-related with IPV. Additional research is needed on the content of family planning and birth control encounters with school-based clinicians to know if skills useful for teens facing IPV are being discussed and if these interactions are successful in addressing adolescent IPV.

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Table 1.Description of the population overall and by intimate partner violence

Characteristics	Total sample number (%)	Any IPV (%)	No IPV (%)	p-value
Total	9,439	907 (16.6)	4,142 (83.3)	
Gender				0.8811
Male	4,521 (50.8)	474 (18.1)	2,146 (81.9)	
Female	4,854 (49.2)	409 (17.1)	1,987 (82.9)	
Sexual minority				<.0001
Sexual minority	891 (10.0)	165 (27.8)	428 (72.2)	
Non-sexual minority	7,459 (90.0)	605 (15.9)	3,204 (84.1)	
Ethnicity				0.59
Hispanic/Latino	3,857 (37.6)	413 (18.2)	1,853 (81.8)	
Not Hispanic/Latino	5,323 (62.4)	455 (17.1)	2,205 (82.9)	
Education on birth control				0.3141
Never	2,338 (31.2)	185 (17.5)	872 (82.5)	
Seventh grade or earlier	2,525 (33.1)	277 (18.8)	1,200 (81.2)	
Eighth or ninth grade	2,233 (28.2)	194 (15.7)	1,044 (84.3)	
Tenth, eleventh, or twelfth grade	552 (7.4)	54 (20.5)	210 (79.5)	
Birth control use				<.0001
Have used birth control	1,917 (22.5)	358 (24.7)	1,090 (75.3)	
Never used birth control	6,179 (77.5)	382 (13.7)	2,416 (86.3)	
Birth control access				0.1652
Outside of school	1,474 (77.0)	283 (25.3)	835 (74.7)	
School	443 (23.0)	75 (22.7)	255 (77.3)	
Access to school based health center				<.0001
Yes	5,889 (85.0)	482 (15.9)	2,551 (84.1)	
No	1,049 (15.0)	133 (25.0)	400 (75.0)	
Use of school based health center				0.1649
Yes	2,148 (35.0)	219 (18.5)	965 (81.5)	
No	3,741 (65.1)	263 (14.2)	1,586 (85.8)	
Suicidal thoughts or attempts				
Yes	1,523 (18.3)	344 (38.5)	549 (61.5)	<.0001
No	6,429 (81.7)	398 (12.4)	2,816 (87.6)	
Alcohol or marijuana use				
Used alcohol or marijuana	2,830 (31.7)	498 (25.5)	1,452 (74.5)	<.0001
Did not use	5,538 (68.3)	249 (10.1)	2,226 (89.9)	
Multiple sex partners				<.0001
Yes	858 (11.2)	206 (31.1)	457 (68.9)	
No	6,748 (88.8)	442 (11.5)	3,392 (88.5)	
Always use of condoms				<.0001
Yes	998 (48.7)	139 (17.8)	643 (82.2)	
No	1,052 (51.3)	255 (30.0)	596 (70.0)	
Any bullying				<.0001
Yes	1,805 (18.7)	342 (35.5)	622 (64.5)	
No	7,452 (81.3)	504 (12.6)	3,489 (87.4)	

Table 2. Unadjusted and adjusted odds ratio for any intimate partner violence by grade of first birth control education, controlled for selected characteristics

	Odds ratio	95% CI	p-value
Univariate model (n)		(n=5,049)	
First classroom education on birth control methods received in			
Never	1.00	---	----
Seventh grade or earlier	0.897	0.676-1.190	0.4501
Eighth or ninth grade	0.72	0.517-1.003	0.0521
Tenth, eleventh, or twelfth grade	1.007	0.683-1.486	0.9705
Multivariate model		(n=1,057)	
Never	1.00	----	----
Seventh grade or earlier	0.778	0.453-1.338	0.3649
Eighth or ninth grade	0.729	0.369-1.438	0.3613
Tenth, eleventh, or twelfth grade	0.655	0.269-1.594	0.351
Sexual minority			
Sexual minority	1.454	0.888-2.383	0.137
Non-sexual minority	1.00	----	----
Gender			
Male	1.00	----	----
Female	1.29	0.853-1.941	0.2297
Ethnicity			
Hispanic/Latino	0.916	0.598-1.403	0.6869
Not Hispanic/Latino	1.00	----	----
Suicidal thoughts or attempts			
Yes	3.338	2.019-5.519	<.0001
No	1.00	----	----
Alcohol or marijuana use			
Yes	1.68	1.066-2.647	0.0253
No	1.00	----	----
Multiple sex partners			
Yes	2.121	1.303-3.453	0.0025
No	1.00	----	----
Always use of condoms			
Yes	0.468	0.288-0.760	0.0022
No	1.00	----	----
Any bullying			
Yes	2.307	1.421-3.745	0.0007
No	1.00	----	----

Table 3. Unadjusted and adjusted odds ratio for any intimate partner violence by grade of first birth control education, stratified on sexual minority identity and controlled for selected characteristics

	Among sexual minority youth			Among non-sexual minority youth		
	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value
Univariate model (n)		(n=593)			(n=3,809)	
First education on birth control methods						
Never	1.00	----	-----	1.00	-----	----
Seventh grade or earlier	1.039	0.614-1.758	0.8857	0.857	0.626-1.174	0.3369
Eighth or ninth grade	0.596	0.267-1.332	0.2073	0.779	0.544-1.116	0.1739
Tenth, eleventh, or twelfth grade	0.357	0.082-1.555	0.1700	1.183	0.756-1.853	0.4624
Multivariate model		(n=156)			(n=901)	
Never	1.00	----	-----	1.00	------	-----
Seventh grade or earlier	**0.152**	**0.026-0.896**	**0.0374**	0.898	0.495-1.627	0.7226
Eighth or ninth grade	**0.125**	**0.017-0.942**	**0.0436**	0.820	0.393-1.708	0.596
Tenth, eleventh, or twelfth grade	**0.017**	**0.001-0.225**	**0.0020**	0.831	0.344-2.011	0.6820
Gender						
Male	1.00	----	----	0.744	0.472-1.268	0.3085
Female	1.337	0.342-5.228	0.6762	1.00	----	----
Ethnicity						
Hispanic/Latino	**0.143**	**0.034-0.594**	**0.0074**	1.08	0.680-1.717	0.7434
Not Hispanic/Latino	1.00	----	----	1.00	----	----
Suicidal thoughts or attempts						
Yes	**9.213**	**3.498-24.26**	**<.0001**	**2.931**	**1.651-5.202**	**0.0002**
No	1.00	----	----	1.00	----	----
Alcohol or marijuana use						
Yes	2.246	0.677-7.445	0.1859	1.65	0.990-2.737	0.0546
No	1.00	----	----	1.00	----	----
Multiple sex partners						
Yes	1.709	0.635-4.601	0.2891	**2.255**	**1.305-3.899**	**0.0036**
No	1.00	----	----	1.00	----	----
Always use of condoms						
Yes	0.456	0.159-1.306	0.1435	**0.451**	**0.256-0.795**	**0.0059**
No	1.00	----	----	1.00	----	----
Any bullying						
Yes	**10.918**	**3.447-34.58**	**<.0001**	**1.896**	**1.112-3.235**	**0.0189**
No	1.00	----	----	1.00	----	----

Table 4. Unadjusted and adjusted odds ratio for any intimate partner violence among those with access to school-based health centers controlled for selected characteristics

	Odds ratio	95% CI	p-value
Univariate models (n)			
Access to school-based health centers (n=3,566)			
Yes	**0.525**	**0.393-0.701**	**<.0001**
No	1.00	----	----
Use of school-based health centers among those with access (n=3,033)			
Yes	1.269	0.906-1.777	0.166
No	1.00	----	----
Multivariate model			
Access to school-based health centers (n=3,036)			
Yes	0.665	0.439-1.009	0.0549
No	1.00	----	----
Sexual minority			
Yes	**1.75**	**1.273-2.405**	**0.0006**
No	1.00	----	----
Multiple sex partners			
Yes	**2.912**	**2.017-4.206**	**<.0001**
No	1.00	----	----
Any bullying			
Yes	**3.318**	**2.430-4.531**	**<.0001**
No	1.00	----	----
Multivariate model			
Use of school-based health centers among those with access (n=741)			
Yes	0.778	0.487-1.241	0.290
No	1.00	----	----
Sexual minority			
Yes	**2.143**	**1.071-4.289**	**0.031**
No	1.00	----	----
Suicidal thoughts or attempts			
Yes	**3.355**	**1.071-4.289**	**<.0001**
No	1.00	----	----
Alcohol or marijuana use			
Yes	1.644	0.941-2.874	0.0809
No	1.00	----	----
Multiple sex partners			
Yes	1.493	0.952-2.341	0.0807
No	1.00	----	----
Always use of condoms			
Yes	**0.499**	**0.305-0.817**	**0.0057**
No	1.00	----	----
Any bullying			
Yes	**2.273**	**1.310-3.946**	**0.0035**
No	1.00	----	----

Table 5. Unadjusted and adjusted odds ratio for any intimate partner violence among those accessing birth control from school controlled for selected characteristics

	Odds ratio	95% CI	p-value
Univariate model (n)			
Accessed birth control from school (n=1,448)			
Yes	0.735	0.473-1.142	0.170
No	1.00	----	----
Multivariate model			
Accessed birth control from school (n=841)			
Yes	0.712	0.382-1.326	0.2839
No	1.00	----	----
Sexual minority			
Yes	1.788	1.002-3.192	0.0493
No	1.00	----	----
Multiple sex partners			
Yes	2.125	1.260-3.583	0.0047
No	1.00	----	----
Any bullying			
Yes	2.554	1.515-4.307	0.0004
No	1.00	----	----
Alcohol or marijuana use			
Yes	1.845	0.917-3.713	0.0861
No	1.00	----	----
Always use of condoms			
Yes	0.392	0.218-0.706	0.0018
No	1.00	----	----

Appendix: SAS syntax

```
***call in the yrbs data;
libname yrbs13 'E:\Data Management\yrbs';
***call in the yrbs formatting;
filename formatin 'E:\Data Management\yrbs\yrbs13p-formatstatements';
%include 'E:\Data Management\yrbs\yrbs13p-formatsnumeric.sas';
***give data a nickname;
data y13; set yrbs13.yrbs2013;
run;
***see the contents of the data;
proc contents data=y13; run;
*create format for variables;
proc format;
value onezero
      0='0 No'
      1='1 Yes';
value bcedgradecat
      1='Never'
      2='Seventh grade or earlier'
      3='Eighth or ninth grade'
      4='Tenth, eleventh, or twelfth grade';
      run;

***provide new names for variables without replacing old variable
names,create dummy variables for polytomous exposures;
***recode variables to be yes=1 and no=0 and give them formats and labels;
data y13; set yrbs13.yrbs2013;

strata=stratum;
cluster=psu;
weight=weight;
physipvyn=qn22;
sexipvyn=qn23;
gender=nq2;
age=nq1;
bcedgrade=nq103;
wherebcaccess=nq102;
sbhc=nq125;
sadtwowks=qn26;
considersuicide=qn27;
attemptsuicide=qn29;
alcoholpstmo=qn43;
potpstmo=qn49;
sexbefore13=qn60;
sexpartmorethan4=qn61;
alwayscondom=qn99;
everpreg=qn104;
inuslessthanyr=qn88;
absentunsafe=qn16;
bullied=qn24;
cyberbullied=qn25;
numbersexpartqrt=nq62;
allhispaniclatino=nq4;
sexualminority=qn106;
sexminnotsure=nq106;
```

```
eversex=nq59;

anyipv=.;
if sexipvyn=1 or physipvyn=1 then anyipv=1;
if sexipvyn=2 & physipvyn=2 then anyipv=2;

sexualminority10=.;
if sexualminority=1 then sexualminority10=1;
if sexualminority=2 then sexualminority10=0;

sexminnotsure10=.;
if sexminnotsure=1 then sexminnotsure10=0;
if sexminnotsure=2 then sexminnotsure10=1;
if sexminnotsure=3 then sexminnotsure10=1;
if sexminnotsure=4 then sexminnotsure10=1;

sexminnotsuremiss10=.;
if sexminnotsure=1 then sexminnotsuremiss10=0;
if sexminnotsure=2 then sexminnotsuremiss10=1;
if sexminnotsure=3 then sexminnotsuremiss10=1;
if sexminnotsure=4 then sexminnotsuremiss10=.;

female=.;
if gender=1 then female=1;
if gender=2 then female=0;

allhislat10=.;
if allhispaniclatino=1 then allhislat10=1;
if allhispaniclatino=2 then allhislat10=0;

ageyounger=.;
if age=1 or age=2 or age=3 then ageyounger=1;
else ageyounger=0;
ageolder=.;
if age=5 or age=6 or age=7 then ageolder=1;
else ageolder=0;
age12=.;
if age=1 then age12=1;
else age12=0;
age13=.;
if age=2 then age13=1;
else age13=0;
age14=.;
if age=3 then age14=1;
else age14=0;
age16=.;
if age=5 then age16=1;
else age16=0;
age17=.;
if age=6 then age17=1;
else age17=0;
age18=.;
if age=7 then age18=1;
else age18=0;

bcedgradecat=.;
if bcedgrade=1 then bcedgradecat=1;
```

```
if bcedgrade=2 or bcedgrade=3 then bcedgradecat=2;
if bcedgrade=4 or bcedgrade=5 then bcedgradecat=3;
if bcedgrade=6 or bcedgrade=7 then bcedgradecat=4;
if bcedgrade=8 then bcedgradecat=.;
bcedgradecat1=.;
if bcedgrade=2 or bcedgrade=3 then bcedgradecat1=1;
else bcedgradecat1=0;
bcedgradecat2=.;
if bcedgrade=4 or bcedgrade=5 then bcedgradecat2=1;
else bcedgradecat2=0;
bcedgradecat3=.;
if bcedgrade=6 or bcedgrade=7 then bcedgradecat3=1;
else bcedgradecat3=0;

everbc=.;
if wherebcaccess=2 or wherebcaccess=3 or wherebcaccess=4 or wherebcaccess=5
or wherebcaccess=6 then everbc=1;
if wherebcaccess=1 then everbc=0;
bcfromschool=.;
if wherebcaccess=3 then bcfromschool=1;
if wherebcaccess=2 or wherebcaccess=4 or wherebcaccess=5 or wherebcaccess=6
then bcfromschool=0;
if wherebcaccess=1 then bcfromschool=.;

sbhcaccess=.;
if sbhc=2 or sbhc=3 then sbhcaccess=1;
if sbhc=1 then sbhcaccess=0;
sbhcyes=.;
if sbhc=2 then sbhcyes=1;
if sbhc=3 then sbhcyes=0;
if sbhc=1 then sbhcyes=.;
sbhcno=.;
if sbhc=3 then sbhcno=1;
if sbhc=1 or sbhc=2 then sbhcno=0;

sadtwowks10=.;
if sadtwowks=1 then sadtwowks10=1;
if sadtwowks=2 then sadtwowks10=0;
considersuicide10=.;
if considersuicide=1 then considersuicide10=1;
if considersuicide=2 then considersuicide10=0;
attemptsuicide10=.;
if attemptsuicide=1 then attemptsuicide10=1;
if attemptsuicide=2 then attemptsuicide10=0;
anysuicide=.;
if considersuicide=1 or attemptsuicide=1 then anysuicide=1;
if considersuicide=2 & attemptsuicide=2 then anysuicide=0;

alcoholpstmo10=.;
if alcoholpstmo=1 then alcoholpstmo10=1;
if alcoholpstmo=2 then alcoholpstmo10=0;

potpstmo10=.;
if potpstmo=1 then potpstmo10=1;
if potpstmo=2 then potpstmo10=0;
anysubstance=.;
if alcoholpstmo=1 or potpstmo=1 then anysubstance=1;
```

```
if alcoholpstmo=2 & potpstmo=2 then anysubstance=0;

sexbefore1310=.;
if sexbefore13=1 then sexbefore1310=1;
if sexbefore13=2 then sexbefore1310=0;
sexpartmorethan410=.;
if sexpartmorethan4=1 then sexpartmorethan410=1;
if sexpartmorethan4=2 then sexpartmorethan410=0;
numbersexpartqrt10=.;
if numbersexpartqrt=4 then numbersexpartqrt10=1;
if numbersexpartqrt=5 then numbersexpartqrt10=1;
if numbersexpartqrt=6 then numbersexpartqrt10=1;
if numbersexpartqrt=7 then numbersexpartqrt10=1;
if numbersexpartqrt=8 then numbersexpartqrt10=1;
if numbersexpartqrt=1 then numbersexpartqrt10=0;
if numbersexpartqrt=2 then numbersexpartqrt10=0;
if numbersexpartqrt=3 then numbersexpartqrt10=0;
multsexpart=.;
if numbersexpartqrt10=1 or sexpartmorethan4=1 then multsexpart=1;
if numbersexpartqrt10=0 & sexpartmorethan4=2 then multsexpart=0;

alwayscondom10=.;
if alwayscondom=1 then alwayscondom10=1;
if alwayscondom=2 then alwayscondom10=0;

everpreg10=.;
if everpreg=1 then everpreg10=1;
if everpreg=2 then everpreg10=0;

inuslessthanyr10=.;
if inuslessthanyr=1 then inuslessthanyr10=1;
if inuslessthanyr=2 then inuslessthanyr10=0;

absentunsafe10=.;
if absentunsafe=1 then absentunsafe10=1;
if absentunsafe=2 then absentunsafe10=0;
bullied10=.;
if bullied=1 then bullied10=1;
if bullied=2 then bullied10=0;
cyberbullied10=.;
if cyberbullied=1 then cyberbullied10=1;
if cyberbullied=2 then cyberbullied10=0;
anybully=.;
if bullied=1 or cyberbullied=1 then anybully=1;
if bullied=2 & cyberbullied=2 then anybully=0;

format female
sbhcyes sbhcno sbhcaccess
age12 age13 age14 age16 age17 age18
sadtwowks10 considersuicide10 attemptsuicide10
alcoholpstmo10
potpstmo10 anysubstance
sexbefore1310 sexpartmorethan410 alwayscondom10 everpreg10 bcfromschool
numbersexpartqrt10
inuslessthanyr10
absentunsafe10 cyberbullied10 bullied10 anybully
multsexpart anysuicide
```

```
allhislat10 sexualminority10
bcedgradecat1 bcedgradecat2 bcedgradecat3 everbc
ageyounger ageolder sexminnotsure10 sexminnotsuremiss10 onezero.;

format anyipv yesno13f.;
format bcedgradecat bcedgradecat.;

label bcedgradecat=Compressed categorical birth control education variable;
label everbc=Have ever used birth control;
label anyipv=Hurt by date or forced to do something sexual by date one or
more times in the last year;

label female=Female;
label sexualminority10=Identifies as lesbian, gay, or bisexual;
label sexminnotsure10=Identifies as lesbian, gay, bisexual or not sure;
label sexminnotsuremiss10=Identifies as lesbian, gay, or bisexual;

label allhislat10=Latino or Hispanic;

label ageyounger=Younger than fifteen years old;
label ageolder=Older than fifteen years old;
label age12=Twelve years old or younger;
label age13=Thirteen years old;
label age14=Fourteen years old;
label age16=Sixteen years old;
label age17=Seventeen years old;
label age18=Eighteen years old or older;

label bcedgradecat1=Classroom education on birth control in seventh grade or
earlier;
label bcedgradecat2=Classroom education on birth control in eighth grade or
ninth grade;
label bcedgradecat3=Classroom education on birth control in tenth, eleventh,
or twelfth grade;

label sbhcaccess=Has access to school-based health center;
label sbhcyes=Have used school-based health center;
label sbhcno=Have not used school-based health center;

label sadtwowks10=Felt sad/hopeless for at least two weeks in the last year;
label considersuicide10=Considered suicide in last year;
label attemptsuicide10=Attempted suicide in last year;
label anysuicide=Suicidal thoughts or attempts in past year;

label anysubstance=Drank alcohol or used marijuana one or more times in past
month;
label alcoholpstmo10=Drank alcohol in the past month;
label potpstmo10=Used marijuana one or more times in past month;

label multsexpart=Multiple sex partners;
label sexbefore1310=Had sex first time before age thirteen;
label sexpartmorethan410=Had sex with four or more partners in lifetime;
label numbersexpartqrt10=Had sex with more than one partner in the past three
months;

label alwayscondom10=Always used a condom at sex (among those who had sex in
past three months;
```

```
label everpreg10=Ever been pregnant/gotten someone pregnant;

label bcfromschool=Got birth control at school at last use;

label inuslessthanyr10=Lived in the US for more than one year;

label absentunsafe10=Missed school because felt unsafe one or more times in
past month;
label cyberbullied10=Bullied electronically in the past year;
label bullied10=Bullied in the past year;
label anybully=Either physically bullied or cyberbullied in the past year;
run;
***check all recoded variables and run queries to identify problematic data,
including all newly combined or created variables;
proc freq data=y13;
tables physipvyn qn22
sexipvyn qn23 physipvyn*sexipvyn
anyipv
raceeth8 allhislat10 allhispaniclatino nq4
gender female
bcedgrade nq103
bcedgradecat
bcedgradecat1 bcedgradecat2 bcedgradecat3 everbc bcfromschool qn102
wherebcaccess nq102 nq102*qn102
sbhc nq125 qn125 sbhcyes sbhcno sbhcaccess
age nq1 age12 age13 age14 age16 age17 age18 ageyounger ageolder
sadtwowks sadtwowks10 qn26  considersuicide considersuicide10 qn27
considersuicide*attemptsuicide anysuicide
attemptsuicide attemptsuicide10 qn29
alcoholpstmo10 alcoholpstmo qn43 alcoholpstmo*potpstmo
anysubstance
potpstmo10 potpstmo qn49
sexbefore1310 sexbefore13 qn60 sexpartmorethan410 sexpartmorethan4 qn61
numbersexpartqrt numbersexpartqrt10 nq62 numbersexpartqrt*sexpartmorethan4
multsexpart
alwayscondom10 alwayscondom qn99 everpreg10 everpreg qn104
qn88 inuslessthanyr inuslessthanyr10
qn16 absentunsafe absentunsafe10 qn24 bullied bullied10 qn25 cyberbullied
cyberbullied10 cyberbullied*bullied anybully;
run;
***Check that there are no contradictory observations;
proc print data=y13 NOOBS;
var anyipv physipvyn sexipvyn;
where anyipv=1 & physipvyn=2 & sexipvyn=2;
run;
proc print data=y13 NOOBS;
var cyberbullied bullied anybully;
where anybully=1 & bullied=2 & cyberbullied=2;
run;
proc print data=y13 NOOBS;
var anysuicide attemptsuicide considersuicide;
where anysuicide=1 & attemptsuicide=2 & considersuicide=2;
run;
proc print data=y13 NOOBS;
var anysubstance potpstmo alcoholpstmo;
where anysubstance=1 & potpstmo=2 & alcoholpstmo=2;
run;
```

```
proc print data=y13 NOOBS;
var numbersexpartqrt sexpartmorethan4 multsexpart;
where multsexpart=1 & numbersexpartqrt=2 & sexpartmorethan4=2;
run;
***Run surveyfreq for total sample to get demographics for table 1;
PROC SURVEYFREQ data=y13;
TABLES  physipvyn sexipvyn anyipv
female gender sexualminority10 sexualminority qn106
allhislat10
bcedgradecat bcedgrade
bcfromschool
everbc
sbhcaccess sbhcyes sbhcno
age age12 age13 age14 age16 age17 age18
sadtwowks anysuicide
anysubstance
sexbefore13 multsexpart
alwayscondom everpreg inuslessthanyr
absentunsafe anybully;
STRATA Stratum;
CLUSTER PSU;
WEIGHT Weight ;
RUN;
***Chi-square;
PROC SURVEYFREQ data=y13;
TABLES anyipv*gender
anyipv*sexualminority
anyipv*sexminnotsure10
anyipv*allhispaniclatino
anyipv*age
anyipv*bcedgradecat
anyipv*wherebcaccess
anyipv*sbhcyes
anyipv*sbhcaccess
anyipv*anysuicide
anyipv*sadtwowks
anyipv*anysubstance
anyipv*multsexpart
anyipv*sexbefore13
anyipv*everpreg
anyipv*alwayscondom
anyipv*absentunsafe
anyipv*anybully
anyipv*inuslessthanyr
anyipv*everpreg
anyipv*bcfromschool
anyipv*everbc/row CHISQ;
STRATA Stratum;
CLUSTER PSU;
WEIGHT Weight ;
RUN;
***anyipv with grade student received birth control education;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3;
weight Weight;
```

```
run;
***Stratified univariate analysis;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sexualminority10;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sexualminority10;
weight Weight;
run;
***Univariate analysis with one confounder at a time to assess 10% change;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3 female;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3 ageyounger
ageolder;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
allhislat10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
anysuicide;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sadtwowks10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexbefore1310;
weight Weight;
run;
```

```
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
alwayscondom10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
everpreg10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
inuslessthanyr10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
absentunsafe10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3 anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexualminority10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
anysubstance;
weight Weight;
run;
***any ipv with sbhc access;
proc surveylogistic data=y13;
```

```
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess;
weight Weight;
run;
****Add in confounders one at a time to assess 10% change;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess female;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess ageyounger ageolder;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess allhislat10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess anysuicide;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess sadtwowks10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess sexbefore1310;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess alwayscondom10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
```

```
model anyipv(descending)=sbhcaccess everpreg10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess inuslessthanyr10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess absentunsafe;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess sexualminority10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess anysubstance;
weight Weight;
run;
***Sub-analysis of sbhc use among those with sbhc access;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes female;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes ageyounger ageolder;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
```

```
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes allhislat10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes anysuicide;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sadtwowks10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexbefore1310;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes alwayscondom10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes everpreg10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes inuslessthanyr10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
```

```
domain sbhcaccess;
model anyipv(descending)=sbhcyes absentunsafe;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexualminority10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes anysubstance;
weight Weight;
run;
***any ipv with wherebcaccess among those who are sexually active;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool female;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool ageyounger ageolder;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool allhislat10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
```

```
domain everbc;
model anyipv(descending)=bcfromschool anysuicide;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sadtwowks10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sexbefore1310;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool alwayscondom10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool everpreg10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool inuslessthanyr10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool absentunsafe;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
```

```
model anyipv(descending)=bcfromschool anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sexualminority10;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool anysubstance;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexminnotsure10
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
***INTERACTION adjusted model for anyipv with grade received birth control ed
with interaction term for emm between sexual minority youth
and the grade in which participant first received birth control ed;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexminnotsure10
bcedgradecat1*sexminnotsure10 bcedgradecat2*sexminnotsure10
bcedgradecat3*sexminnotsure10
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexminnotsure10
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexminnotsure10
bcedgradecat1*sexminnotsure10 bcedgradecat2*sexminnotsure10
bcedgradecat3*sexminnotsure10
```

```
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexminnotsuremiss10
bcedgradecat1*sexminnotsuremiss10 bcedgradecat2*sexminnotsuremiss10
bcedgradecat3*sexminnotsuremiss10
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexualminority10
bcedgradecat1*sexualminority10 bcedgradecat2*sexualminority10
bcedgradecat3*sexualminority10
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexualminority10 female allhislat10 anysuicide multsexpart anysubstance
alwayscondom10 anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3;
weight Weight;
run;
***check frequencies before stratifying;
PROC SURVEYFREQ data=y13;
TABLES
anyipv*sexualminority*ageyounger
anyipv*sexualminority*ageolder
anyipv*sexualminority*anysuicide
anyipv*sexualminority*sadtwowks10
anyipv*sexualminority*anysubstance
anyipv*sexualminority*sexbefore13
anyipv*sexualminority*multsexpart
anyipv*sexualminority*alwayscondom
anyipv*sexualminority*anybully
anyipv*sexualminority*absentunsafe
anyipv*sexualminority*age
STRATA Stratum;
CLUSTER PSU;
WEIGHT Weight ;
```

```
RUN;
***stratify the analysis;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sexualminority10;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sexminnotsure10;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sexminnotsuremiss10;
model anyipv(descending)=bcedgradecat1 bcedgradecat2 bcedgradecat3
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
***interaction term with physical ipv only;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model physipvyn=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexualminority10
bcedgradecat1*sexualminority10 bcedgradecat2*sexualminority10
bcedgradecat3*sexualminority10
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
***Interaction seen here, stratified model used as final;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sexualminority10;
model physipvyn=bcedgradecat1 bcedgradecat2 bcedgradecat3
sexualminority10
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
***interaction term with sexual ipv only;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model sexipvyn=bcedgradecat1 bcedgradecat2 bcedgradecat3
```

```
sexualminority10
bcedgradecat1*sexualminority10 bcedgradecat2*sexualminority10
bcedgradecat3*sexualminority10
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
***no interaction, final model;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model sexipvyn=bcedgradecat1 bcedgradecat2 bcedgradecat3
female allhislat10 anysuicide multsexpart anysubstance alwayscondom10
anybully;
weight Weight;
run;
***NO INTERACTION adjusted model for anyipv with sbhc access and interaction
term between sbhc access and sexual minority identity;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess sexminnotsure10
sbhcaccess*sexminnotsure10
multsexpart anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess sexminnotsuremiss10
sbhcaccess*sexminnotsuremiss10
multsexpart anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess sexualminority10
sbhcaccess*sexualminority10
multsexpart anybully;
weight Weight;
run;
***no interaction, final model;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess sexualminority10 multsexpart anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model anyipv(descending)=sbhcaccess sexminnotsure10 multsexpart anybully;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
```

```
cluster psu;
model anyipv(descending)=sbhcaccess sexminnotsuremiss10 multsexpart anybully;
weight Weight;
run;
***interaction between sbhc access and sexual minority;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model physipvyn=sbhcaccess sexualminority10 sbhcaccess*sexualminority10
multsexpart anybully;
weight Weight;
run;
***no interaction, final model;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model physipvyn=sbhcaccess sexualminority multsexpart anybully;
weight Weight;
run;
***interaction term for sbhc access and sexual minority for sexual ipv;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model sexipvyn=sbhcaccess sexualminority sbhcaccess*sexualminority10
multsexpart anybully;
weight Weight;
run;
***No interaction, final model;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
model sexipvyn=sbhcaccess sexualminority multsexpart anybully;
weight Weight;
run;
***NO INTERACTION use of sbhc, interaction between sbhc use and sexual
minority identity;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexualminority10 sbhcyes*sexualminority10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexminnotsure10 sbhcyes*sexminnotsure10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
```

```
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexminnotsuremiss10
sbhcyes*sexminnotsuremiss10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexminnotsure10 sbhcyes*sexminnotsure10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexminnotsuremiss10
sbhcyes*sexminnotsuremiss10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
***No interaction, final model;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexualminority10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexminnotsure10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model anyipv(descending)=sbhcyes sexminnotsuremiss10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
***Interaction model for physical ipv with sbhc use and sexual minority
identity;
proc surveylogistic data=y13;
```

```
strata Stratum;
cluster psu;
domain sbhcaccess;
model physipvyn=sbhcyes sexualminority10 sbhcyes*sexualminority10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
***No interaction, final model;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model physipvyn=sbhcyes sexualminority10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
***sexual ipv with sbhc access and interaction on sexual minority status;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model sexipvyn=sbhcyes sexualminority10 sbhcyes*sexualminority10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
***no interaction, final model;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain sbhcaccess;
model sexipvyn=sbhcyes sexualminority10
anysuicide multsexpart alwayscondom10
anybully anysubstance;
weight Weight;
run;
***NO INTERACTION any ipv with bc from school and interaction term on sexual
minority;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sexualminority10
bcfromschool*sexualminority10
anysubstance anybully alwayscondom10
multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sexminnotsure10
bcfromschool*sexminnotsure10
anysubstance anybully alwayscondom10
```

```
multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sexminnotsure10
bcfromschool*sexminnotsuremiss10
anysubstance anybully alwayscondom10
multsexpart;
weight Weight;
run;
***No interaction seen, final model;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sexualminority10 anysubstance anybully
alwayscondom10
multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sexminnotsure10 anysubstance anybully
alwayscondom10
multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model anyipv(descending)=bcfromschool sexminnotsuremiss10 anysubstance
anybully alwayscondom10
multsexpart;
weight Weight;
run;

proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model physipvyn=bcfromschool sexualminority10 bcfromschool*sexualminority10
anysubstance anybully alwayscondom10
multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model physipvyn=bcfromschool sexualminority10 anysubstance anybully
alwayscondom10
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```
multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model sexipvyn=bcfromschool sexualminority10 bcfromschool*sexualminority10
anysubstance anybully alwayscondom10
multsexpart;
weight Weight;
run;
proc surveylogistic data=y13;
strata Stratum;
cluster psu;
domain everbc;
model sexipvyn=bcfromschool sexualminority10 anysubstance anybully
alwayscondom10
multsexpart;
weight Weight;
run;
```

	Points Allowed	Comments on draft	Comments on final paper	Grade
OVERALL	For a journal, you might try the International Journal of Public Health or Global Public Health. You might also rework the Ecuador paper for publication and get two papers (out of one class).			
Introduction	20	I wonder if it might read better if you organized it this way (1) adolescent suicide rates in Ecuador are higher than in other countries in the region including the USA (2) A number of factor have bene found to predict suicide outcomes in other countries, including hunger, (3) in Ecuador, a high proportion of HHs experience hunger (4) therefore you will look at … Also, you need to justify looking at interaction by gender in the intro. Why do you think gender is an effect modifier?	I think the introduction is pretty good, but I would describe a bit more about the risk factors that have been associated with suicide outcomes in the Americas and reorient the focus to (1) describe differences in suicide outcomes by country using data collected with the same methods and (2) identify whether the reasons for regional differences that remain (when similar methods re used) are due to differences in the prevalence of known risk factors.	17
Methods	20	Good, but you should describe	Good, although a good editing	19

		the other dependent variables in more detail and be sure to write in the past tense.	is needed for typos and some areas that are unclear or inaccurate. So you had to exclude Ecuador because it did not collect data on certain risk factors?	
Results	20	See comments in text Table 1 needs n and weighted percent for all cells.	Try to describe in a bit more detail. Include p-values as well as percents when describing the associations in table 1 and ORs and p-values (add p-values to tables 2 and 3) when describing the regression results. Table1, add a total column. Make sure to include all categories within a variable (e.g. those who had no suicidal thoughts)	19
Discussion	20	I think I would start out by comparing the suicide and	Good, but again I would emphasize that after adjusting	19

		hunger rates you found to those of other studies in Ecuador, then compare the associations you found with other studies outside of Ecuador. Then talk about limitations, followed by policy implications and future research. Be sure to address generalizability.	for known risk factors, there were only a few national differences in suicidal outcomes. This, as you say, suggests that targeting the prevalent risk factors in these countries might reduce the differences in the suicide rates by country.	
Other (endnote codes, grammar, etc.)	20	Good	20	Good
GRADE			91%	94%

May 18, 2015

Dear Professor Kelvin,

Based your advice, I've taken this paper in a much broader direction. Rather than focusing in on one country and one risk factor, I've decided to look at multiple risk factors for suicidal ideation and behavior in 5 Latin American countries. This required overhauling most of the paper and I think the introduction and discussion need further substantial work in order to make a more cohesive paper. I have a few next steps planned for this analysis. They include 1) multiple imputation to determine if missing data biased the results and 2) conducting interaction analyses of related risk factors (e.g., physical fighting and alcohol misuse; hunger and low parental involvement) per your recommendation to my previous draft. I would appreciate any additional comments to direct the analysis and paper.

Many thanks,

Individual and social risk factors for suicidal ideation and behavior among school-going adolescents in five low- and middle-income countries of the Americas

Introduction

Globally, suicide is a leading cause of death among adolescents and in the Americas, as with other regions, it is a leading public health issue.(1) There is significant variability in the incidence of adolescent suicide in the Americas. For example, in Guyana the estimated age-adjusted suicide morality rate among adolescents is 15.3 per 100,000 population; however, in neighboring Brazil the rate is 3.4 per 100,000 population.(1) Suicidal ideation (i.e., seriously considering or planning suicide) and behavior (i.e., suicide attempts) are important precursors to completed suicide. Relative to high-income countries, there are limited data on the epidemiology of suicidal ideation and behavior and associated risk factors in low- and middle-income countries and even less data in low- and middle-income countries in the Americas.(1-3)

In our review of the literature, we identified a variety of studies in different low- and middle-income Latin American countries, mostly Mexico and Brazil, reporting specific risk factors for suicidal ideation and/or behavior in adolescents. Overall these studies support that low parental involvement(4, 5), alcohol misuse(6), drug use(6, 7), tobacco use(4, 6, 8), being physically attacked(9), bullying victimization(5, 10), and female gender(5, 7, 8, 10, 11) all increase the odds of suicidal ideation and/or behavior. However, these studies are difficult to compare because of differences in samples and study methodology (e.g., use of a convenience sample). Thus we do not know if the national differences in suicidal outcomes are due to differences in research methods, differences in the prevalence of the known risk factors for suicide, or some unknown risk factors influences the suicide rates in some countries. We did not identify any studies making multi-country comparisons in the region. Given the high degree of variability in the prevalence of completed suicides among countries, these data would be important to determine mental health-related public health priorities and interventions at the regional level.

Commented [f1]: Expand a bit

The objectives of this study were to compare the prevalence of suicidal ideation and behavior among school-going adolescents from Bolivia, Costa Rica, Jamaica, Peru, and Suriname and determine their associated individual and social risk factors using data from the Global School-based Student Health Survey (GSHS).

Materials and methods

Sample

The GSHS is a representative cross-sectional survey conducted among school-going adolescents developed by the World Health Organization, in collaboration with United Nations Children's Fund, the United Nations Educational, Scientific, and Cultural Organization, and the Joint United Nations Programme on HIV/AIDS, with financial and technical assistance from the US Centers for Disease Control and Prevention (CDC).(12) The GSHS has been conducted in various countries at different time points. For the present analysis, we pooled data from all countries in the Americas that were categorized as a low- or middle-income country by the World Bank(13), had nationally representative

data, had data on suicidal ideation and behavior and exposures of interest, used the same version of the GSHS questionnaire and were publically available at the time of data analysis (May 2015). The countries (and survey years) included for this study were: Bolivia (2012), Costa Rica (2009), Jamaica (2010), Peru (2010), and Suriname (2009). The overall response rates (school response * student response) were 72% from both Costa Rica and Jamaica, 85% for Peru, 88% for Bolivia and 89% for Suriname.

The GSHS used a two-stage clustered sample design. First, schools were eligible if they had students in grades that include 13 to 15 year olds and were then selected with probability proportional to their student body size. Second, classrooms were selected randomly from within each selected school. Students in selected classrooms were invited to participate. The survey was self-administered in the local language and was anonymous.(12, 14) Students entered their answers on computer scannable answer sheets, which were sent to the CDC for scanning, processing, and editing. Editing included setting to missing any values that were out of range (i.e., if a student selected a response that did not correspond to a possible response for a question), had multiple responses (i.e., if a student selected multiple responses to a single question), lacked logical consistency (i.e., if a student selected responses from two related questions that conflict logically), lacked sufficient responses by all students (i.e., each question had valid data for less than 60% of all students), or were incomplete (i.e., student had less than 20 valid responses). Local ministries of health of each country maintained ethical oversight over their respective country's survey.

Measures

We examined four suicide-related outcomes pertaining to suicidal ideation and behavior: 1) suicidal ideation without planning, 2) suicidal ideation with planning, 3) 1 suicide attempt, and 4) more than 1 suicide attempts. Suicidal ideation was defined as positive response to the question, 'during the past 12 months, did you ever seriously consider attempting suicide?' The variable was then split into two separate variables, suicidal ideation without planning and suicidal with planning based upon the response to the question, 'during the past 12 months did you make a plan about how you would attempt suicide?' Suicidal behavior was characterized by the number of suicide attempts based on a response of ≥1 to the question 'during the past 12 months, how many times did you actually attempt suicide?' We create two different outcomes, one an indicators for having attempted suicide at least once (versus never), and another for having attempted suicide more than once (versus 0-1) included were 1 suicide attempt and more than 1 suicide attempts

We looked at independent variables that previous research suggests are associated with suicidal ideation or behavior and simultaneously may be associated with low socioeconomic status. These variables were: 1) low parental involvement; 2) alcohol misuse; 3) hunger; 4) drug use 5) tobacco use; 6) physical fighting; 7) being physically attacked; 8) bullying victimization; and 9) truancy:

1) Low parental involvement was categorized as a dichotomous variable defined as a response of 'rarely' or 'never' to at least one of the questions pertaining to parental involvement and support: (1) 'during the past 30 days, how often did

your parents or guardians check to see if your homework was done?,' (2) 'during the past 30 days, how often did your parents or guardians understand your problems and worries?,' and (3) 'during the past 30 days, how often did you parents or guardians really know what you were doing with your free time?' Responses of 'sometimes,' 'most of the time,' and 'always,' to any of these three questions were categorized as not having low parental involvement.

2) Alcohol misuse was categorized as a dichotomous variable defined as a response of at least 1 time to the question, 'during your life, how many times have you got in trouble with your family or friends, missed school, or got into fights as a result of drinking alcohol?'
3) Hunger was categorized as a dichotomous variable defined as any response except 'never' (i.e., rarely, sometimes, most of the time, or always) to the question, 'during the past 30 days, how often did you go hungry because there was not enough food in your home?'
4) Drug use was categorized as a dichotomous variable defined as any response except 'I have never used drugs' to the question 'how old were you when you first used drugs?'
5) Tobacco use was categorized as a dichotomous variable defined as a response of at least 1 day to either of the following questions, 'during the past 30 days, on how many days did you smoke cigarettes?' and 'during the past 30 days, on ho many days did you use any tobacco products other than cigarettes, such as (country specific examples)?'
6) Physical fighting was categorized as a dichotomous variable defined as a response of at least 1 time to the question, 'during the past 12 months, how many times were you in a physical fight?'
7) Being physically attacked was defined as a response of at least 1 time to the question, 'during the past 12 months, how many times were you physically attacked?'
8) Bullying victimization was categorized as a dichotomous variable defined as a response of at least 1 day to the question, 'during the past 30 days, on how many days were you bullied?'
9) Truancy was categorized as a dichotomous variable defined as a response of at least 1 day to the question, 'during the past 30 days, on how many days did you miss classes or school without permission?'

Low parental involvement(15, 16), alcohol misuse(17), hunger(18), drug use, tobacco use(19), physical fighting(17, 20), being physically attacked(20), bullying victimization(21), and truancy(22) have all been associated with suicidal ideation and/or behavior among adolescents. We also included age, gender, and country of survey as demographic variables. Age and gender were self-reported by students. Age was categorized into ≤12 years, 13 years, 14 years, 15 years and ≥16 years with the youngest age group selected as a reference group. Country was based upon where the students took the survey and we selected Jamaica as a reference group as it had the highest frequencies of suicidal ideation and behavior.

Commented [f2]: All?

Commented [f3]: Can you give an example or two of what these might be?

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Statistical analysis
We conducted Rao-Scott Chi-Square tests to compare the distribution of the frequencies of suicidal ideation and behavior, potential risk factors, and demographic variables by country. We then ran crude and adjusted multivariable logistic regression models evaluating the association between the potential risk factors and the two measures of suicidal ideation (suicidal ideation with and without planning) and two measures of suicidal behavior (at least 1 suicide attempt and multiple suicide attempts). The multivariable models were adjusted for demographic variables (age, gender, country) and included all of the potential risk factors.

For all analyses, the significance level was set at two-sided alpha of <0.05. All analyses were performed in SAS 9.3 (SAS Institute, Cary NC), adjusted for the sampling design, and were weighted to the school-going adolescent populations of the countries included.

Results
There were statistically significant differences when comparing the prevalence of suicidal ideation and behavior by country (Table 1), with suicidal ideation without planning highest in Jamaica (10.6%) and lowest in Suriname (4.9%). Suicidal ideation with planning was lowest in Costa Rica (5.2%), but was highest in Jamaica (15.7%). Reporting 1 suicide attempt was highest in Bolivia (13.7%) and lowest in Costa Rica (5.9%). Multiple suicide attempts were highest in Jamaica (13.1%) and lowest in Costa Rica (2.5%). There were also statistically significant differences between countries in distribution of age groups, gender, and potential risk factors for suicidal ideation or behavior with the exception of truancy (*P*=0.07).

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In crude logistic regression models (Table 2), alcohol misuse, hunger, drug use, tobacco use, being physically attacked, bullying victimization, and truancy were all significantly associated with increased odds of all measures of suicidal ideation and behavior. Only being in a physical fight was not significantly associated with suicidal ideation without planning. In terms of demographics, male gender was associated with significantly reduced odds of all measures of suicidal ideation and behavior. Older ages (13, 14, and 15 years) were associated with significantly lower odds of reporting 1 suicide attempt compared with students ≤12 years. When compared with Jamaica, other countries had reduced odds of suicidal ideation and behavior, which was statistically significant with the exception of the association for Peru when looking at suicidal ideation with or without planning and Bolivia when looking at the association with suicidal ideation with planning or 1+ suicide attempt

In multivariable logistic regression models adjusted for demographics and all potential risk factors (Table 3), tobacco use, being physically attacked, and bullying victimization were associated with increased odds of suicidal ideation (with and without planning) and behavior (1 suicide attempt and multiple attempts). Low parental involvement and alcohol misuse were associated with significantly increased odds of suicidal ideation with planning and suicide attempts. The only potential risk factors that were not associated with significantly increased odds of suicidal ideation or behavior were hunger and

physical fighting. In terms of demographics, male gender remained significantly associated with reduced odds of suicidal ideation and behavior. Compared with Jamaica, living in Bolivia was associated with higher odds of reporting 1 suicide attempt. Living in Costa Rica was protective for suicidal thinking with planning and suicidal behavior compared with Jamaica. Living in Costa Rica, Peru, and Suriname was associated with lower odds of multiple suicide attempts compared with living in Jamaica.

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Discussion

There were significant differences in the prevalence of suicidal ideation and behavior and their associated risk factors in school-going adolescents when comparing five diverse low- and middle-income countries in the Americas. Relative to the other countries, Jamaica had the highest overall burden of suicidal ideation and behavior and Costa Rica had the lowest. On their own, the majority of variables that we hypothesized were risk factor for suicidal outcomes were significantly associated with suicidal ideation and behavior. When combining all of these variables in logistic regression models with demographic variables, tobacco use, being physically attacked, and bullying victimization were significantly associated with all measures of suicidal ideation and behavior. In addition, low parental involvement and alcohol misuse were associated with suicidal ideation with planning and suicidal behavior. Male gender was protective for all measures of suicidal ideation and behavior.

Our findings are largely consistent with other studies from low- and middle-income countries of the Americas suggesting that low parental involvement(4, 5), alcohol misuse(6), drug use(6, 7), tobacco use(4, 6, 8), being physically attacked(9), bullying victimization(5, 10), and female gender(5, 7, 8, 10, 11) increase the odds of suicidal ideation and/or behavior. However, unlike these studies that focused on one specific country, we included five diverse countries in our analysis, representing distinct regions of the America (i.e., the Andean community, the Caribbean and Central America). We found that Jamaica, which had the highest burden of suicidal ideation and behavior, also had the highest burden of risk factors whereas Costa Rica, which had the lowest burden of suicidal ideation and behavior, had the lowest burden of risk factors. In fact, after adjusting for the known risk factors associated with suicide outcomes, only a few national differences in suicide outcomes remained, suggesting that much of the differences in national rates is due to difference in the prevalence of known risk factors. This suggests that interventions to prevent adolescent suicide in the region should have similar components, but may require different emphasis on specific risk factors within each country.

We found strong and consistent associations between tobacco use and suicidal ideation and behavior, consistent with other studies inside(4, 6, 8) and outside the region.(19) However rather than being causative, tobacco use may simply co-exist with pre-existing conditions that put adolescents at higher risk for suicidal ideation and behavior, such as mental health disorders and psychological distress, and may represent an overlapping indicator for self-harm.(23) In contrast, bullying victimization and being physically attacked are more plausible as causative exposures for suicidal ideation and behavior as

they are direct sources of psychological distress. Physical fighting was not independently associated with suicidal ideation or behavior. However, it may be that physical fighting only when combined with other risk factors, such as alcohol misuse, as found in a previous study(17), increase the risk for suicidal ideation and behavior.

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Although it approached statistical significance for 1 suicide attempt (P=0.05), hunger did not significantly increase the odds of suicidal ideation or behavior was hunger after adjusting for covariates. Although no studies from Latin America or the Caribbean have evaluated the impact of food insecurity or hunger on mental health outcomes, such studies have been conducted in the US and Canada. In a study using data from the third National Health and Nutrition Examination Survey (NHANES) in the US, food insecurity among adolescents was significantly associated with a previous suicide attempt (OR 5.0, 95% CI: 1.7, 14.6), but not suicidal ideation (OR 1.9; 95% CI: 0.8, 4.2) when adjusting for multiple demographic and socioeconomic variables, including family income and employment status.(24) In contrast to the GSHS, which has a single question about individual-level hunger, NHANES uses a validated tool to measure household food insecurity. Although similar conceptually, hunger is a potential consequence of severe food insecurity. Thus, it is possible that the GSHS might underestimate food insecurity and that is why we did not observe a statistically significant effect. However, it is also possible that the relationship between hunger or food insecurity and suicidal ideation or behavior may be confounded by other risk factors that tend to be more prevalent among higher poverty adolescents, such as bullying victimization and being physically attacked, which we included in our analysis, but have not been evaluated in other studies.(18, 24) As surveys such as NHANES do not collect such data, this will be important for future research to elucidate the relationship between food insecurity and suicidal ideation and behavior.

Commented [f8]: Also, it could be that the impact of hunger is context specific. Low level. Occasional hunger/food insecurity may impact suicide differently form constant hunger. I wonder if you try a 3-category hunger variable if you might find something?

Strengths of this study included that we used nationally representative samples of school-going adolescents. There are some important limitations for the interpretation of our findings. First, all data were from cross-sectional surveys and thus, temporality is unclear, particularly as recall for suicidal ideation and behavior was for the last 12 months and recall for some risk factors was in the past 30 days (hunger, tobacco use, bullying, parental involvement, and truancy) or without a specific time frame (low parental involvement, alcohol misuse, drug use). Second, data on additional relevant confounders, such as parental mental illness, that may increase the risk of adolescent suicidal ideation and behavior were not analyzed, as they are not collected as part of the GSHS. Third, our data are only generalizable to adolescents who go to school and were present the day of the survey and are only generalizable to the five countries that we included in this analysis (i.e., not all low- and middle-income countries of the Americas).

In this study, the burden of suicidal ideation and behavior was substantially different when comparing Bolivia, Costa Rica, Jamaica, Peru, and Suriname. We identified several modifiable independent risk factors, including bullying victimization, truancy, tobacco use, alcohol misuse, drug use, and being physically attacked, which partially explained the national differences in suicide outcomes. The school setting represents an ideal environment to implement public health interventions to reduce adolescent suicidal

ideation and behavior. In particular, interventions addressing bullying may have a substantial impact on reducing suicide morbidity and mortality. Additional research is needed to evaluate if the prevalence of suicidal ideation and behavior and their associated risk factors are different for adolescents in low- and middle-income countries of the Americas (and outside the region) who do not attend school.

Table 1. Comparison of weighted frequencies of suicidal ideation and behavior and potential risk factors by country

	Bolivia (N=3696) n (weighted %)	**Costa Rica (N=2679)** n (weighted %)	**Jamaica (N=1623)** n (weighted %)	**Peru (N=2882)** n (weighted %)	**Suriname (N=1698)** n (weighted %)	**P value**
Suicidal ideation in past 12 months						
Without planning	N=3167	N=2512	N=1307	N=2489	N=1529	
	228 (6.6%)	152 (5.9%)	120 (10.6%)	214 (8.4%)	75 (4.9%)	P<0.0001
With planning	N=3463	N=2601	N=1413	N=2782	N=1595	
	445 (12.8%)	137 (5.2%)	206 (15.7%)	366 (12.9%)	143 (9.3%)	P<0.0001
Suicidal behavior in past 12 months						
1 suicide attempt	N=3631	N=2665	N=1609	N=2853	N=1679	
	512 (13.7%)	159 (5.9%)	156 (11.5%)	317 (11.1%)	101 (6.2%)	P<0.0001
More than 1 suicide attempts	N=3631	N=2665	N=1609	N=2853	N=1679	
	265 (7.3%)	69 (2.5%)	183 (13.1%)	183 (6.3%)	63 (3.9%)	P<0.0001
Gender	N=3535	N=2669	N=1595	N=2864	N=1692	
Female	1743 (49.0%)	1382 (49.6%)	817 (48.6%)	1462 (49.4%)	828 (50.7%)	P<0.0001
Male	1792 (51.0%)	1287 (50.4%)	778 (51.5%)	1402 (50.6%)	864 (49.3%)	
Age, years	N=3544	N=2667	N=1600	N=2867	N=1682	
≤12 years	173 (4.8%)	50 (1.7%)	33 (3.5%)	56 (2.0%)	96 (5.5%)	P<0.0001

Commented [f9]: Add a total column

Commented [f10]: Also include the no suicide ideation

Commented [f11]: Include no suicide attempt

13 years	697 (18.3%)	755 (26.6%)	203 (9.6%)	513 (19.6%)	238 (13.8%)	
14 years	1001 (27.3%)	754 (28.3%)	510 (27.8%)	848 (30.3%)	346 (20.4%)	
15 years	980 (29.0%)	713 (27.0%)	479 (29.3%)	956 (31.9%)	272 (22.2%)	
≥16 years	693 (20.6%)	395 (16.5%)	375 (29.9%)	494 (16.2%)	630 (38.0%)	
Low parental involvement in past 30 days	N=3673	N=2673	N=1609	N=2882	N=1646	
	807 (21.2%)	445 (16.7%)	230 (14.1%)	489 (17.3%)	248 (15.1%)	P=0.002
Any history of alcohol misuse	N=3334	N=2609	N=1537	N=2732	N=1619	
	421 (12.7%)	188 (7.6%)	241 (21.4%)	379 (14.0%)	99 (5.9%)	P<0.0001
Any hunger in past 30 days	N=3647	N=2657	N=1592	N=2882	N=1677	
	2289 (61.9%)	539 (20.3%)	899 (60.5%)	1502 (52.2%)	648 (38.9%)	P<0.0001
Any history of drug use	N=3428	N=2673	N=1585	N=2804	N=1683	
	187 (5.5%)	273 (10.9%)	380 (26.3%)	153 (5.6%)	96 (5.6%)	P<0.0001
Current tobacco use	N=3622	N=2662	N=1568	N=2852	N=1675	
	600 (17.2%)	324 (12.8%)	392 (31.2%)	563 (19.7%)	213 (12.7%)	P<0.0001
Physical fighting in past 12 months	N=3689	N=2674	N=1619	N=2881	N=1685	
	1219 (32.9%)	73 (21.8%)	719 (50.2%)	1066 (37.8%)	359 (21.0%)	P<0.0001
Physically attacked in past 12 months	N=3677	N=2679	N=1613	N=2879	N=1684	
	1288 (34.9%)	370 (13.8%)	657 (45.8%)	1090 (38.0%)	418 (24.7%)	P<0.0001
Bullying	N=3445	N=2590	N=1482	N=2771	N=1619	

victimization in past 30 days	1115 (31.8%)	504 (19.0%)	551 (41.8%)	1315 (47.5%)	440 (27.0%)	P<0.0001
Truancy in past 30 days	N=3666	N=2647	N=1584	N=2859	N=1648	
	1220 (33.4%)	971 (37.6%)	517 (39.2%)	1053 (36.9%)	365 (22.0%)	P=0.07

Table 2. Crude logistic regression models for suicidal ideation and behavior

	Suicidal ideation		Suicidal behavior	
	Without planning OR (95% CI)	**With planning OR (95% CI)**	**1 suicide attempt OR (95% CI)**	**More than 1 suicide attempt OR (95% CI)**
Gender	N=10832	N=11659	N=12226	N=12226
Female	REF	REF	REF	REF
Male	**0.57 (0.49, 0.66)**	**0.37 (0.32, 0.44)**	**0.59 (0.52, 0.66)**	**0.59 (0.48, 0.72)**
Age, years	N=10830	N=11652	N=12224	N=12224
≤12 years	REF	REF	REF	REF
13 years	0.75 (0.42, 1.33)	0.70 (0.48, 1.03)	**0.54 (0.43, 0.68)**	0.70 (0.43, 1.13)
14 years	0.79 (0.44, 1.40)	0.74 (0.48, 1.15)	**0.61 (0.45, 0.82)**	0.75 (0.46, 1.20)
15 years	0.91 (0.49, 1.67)	0.81 (0.55, 1.19)	**0.67 (0.52, 0.85)**	0.73 (0.49, 1.09)
≥16 years	0.94 (0.52, 1.70)	0.90 (0.60, 1.34)	0.75 (0.56, 1.01)	0.91 (0.63, 1.33)
Country	N=11004	N=11854	N=12437	N=12437
Jamaica	REF	REF	REF	REF
Bolivia	**0.59 (0.44, 0.79)**	0.79 (0.62, 1.00)	0.82 (0.65, 1.02)	**0.52 (0.39, 0.70)**
Costa Rica	**0.53 (0.40, 0.71)**	**0.29 (0.23, 0.38)**	**0.28 (0.23, 0.35)**	**0.17 (0.12, 0.24)**
Peru	0.77 (0.58, 1.01)	0.79 (0.62, 1.02)	**0.65 (0.50, 0.83)**	**0.45 (0.32, 0.62)**
Suriname	**0.43 (0.30, 0.62)**	**0.55 (0.40, 0.76)**	**0.34 (0.27, 0.44)**	**0.27 (0.18, 0.40)**
Low parental involvement	N=10929	N=11770	N=12348	N=12348
	1.60 (1.28, 2.00)	**2.07 (1.78, 2.40)**	**1.49 (1.23, 1.80)**	**1.83 (1.55, 2.17)**
Alcohol misuse	N=10394	N=11203	N=11719	N=11719
	1.87 (1.44, 2.42)	**3.05 (2.56, 3.64)**	**3.32 (2.82, 3.91)**	**3.34 (2.51, 4.45)**

Commented [f12]: Add p-values as some fields do not emphasize Cis as we do and people understand p-values better.

Hunger	N=10917	N=11753	N=12320	N=12320
	1.53 (1.26, 1.86)	**1.64 (1.40, 1.93)**	**1.72 (1.48, 2.00)**	**1.83 (1.46, 2.29)**
Drug use	N=10695	N=11515	N=12056	N=12056
	1.69 (1.30, 2.19)	**2.54 (2.07, 3.12)**	**3.03 (2.55, 3.60)**	**4.02 (3.14, 5.13)**
Tobacco use	N=10886	N=11730	N=12266	N=12266
	1.75 (1.39, 2.20)	**2.45 (2.00, 2.99)**	**2.69 (2.31, 3.14)**	**3.56 (2.79, 4.53)**
Physical fighting	N=10984	N=11831	N=12409	N=12409
	1.18 (1.00, 1.39)	**1.47 (1.22, 1.77)**	**1.70 (1.50, 1.93)**	**1.94 (1.55, 2.41)**
Physically attacked	N=10971	N=11819	N=12395	N=12395
	1.80 (1.47, 2.20)	**2.65 (2.39, 3.05)**	**2.54 (2.21, 2.92)**	**2.68 (2.18, 3.28)**
Bullying victimization	N=10463	N=11273	N=11782	N=11782
	2.59 (2.11, 3.18)	**2.75 (2.37, 3.19)**	**2.93 (2.57, 3.34)**	**3.62 (2.91, 4.51)**
Truancy	N=10868	N=11709	N=12271	N=12271
	1.46 (1.25, 1.72)	**1.76 (1.50, 2.05)**	**1.71 (1.51, 1.93)**	**1.99 (1.68, 2.35)**

Table 3. Adjusted logistic regression models for suicidal ideation and behavior

	Suicidal ideation		Suicidal behavior	
	Without planning (N=9233) OR (95% CI)	**With planning (N=9923) OR (95% CI)**	**1 suicide attempt (N=10286) OR (95% CI)**	**More than 1 suicide attempt (N=10286) OR (95% CI)**
Gender				
Female	REF	REF	REF	REF
Male	**0.46 (0.37,0.56)**	**0.27 (0.21, 0.34)**	**0.49 (0.41, 0.58)**	**0.43 (0.34, 0.54)**
Age, years				
≤12 years	REF	REF	REF	REF
13 years	1.06 (0.54, 2.08)	1.11 (0.70, 1.74)	0.57 (0.32, 1.01)	1.03 (0.40, 2.63)
14 years	1.00 (0.50, 2.02)	1.08 (0.62, 1.87)	0.60 (0.34, 1.07)	0.90 (0.36, 2.23)
15 years	1.18 (0.58, 2.43)	0.99 (0.60, 1.64)	0.61 (0.34, 1.12)	0.76 (0.33, 1.77)
≥16 years	1.03 (0.50, 2.09)	0.98 (0.55, 1.75)	0.59 (0.32, 1.10)	0.65 (0.27, 1.55)
Country				
Jamaica	REF	REF	REF	REF
Bolivia	0.92 (0.54, 1.55)	0.89 (0.68, 1.15)	**1.63 (1.12, 2.37)**	0.81 (0.55, 1.19)
Costa Rica	1.02 (0.61, 1.70)	**0.42 (0.33, 0.54)**	0.88 (0.60, 1.30)	**0.31 (0.21, 0.44)**
Peru	1.10 (0.68, 1.78)	0.85 (0.70, 1.04)	1.18 (0.79, 1.76)	**0.62 (0.42, 0.91)**
Suriname	0.83 (0.49, 1.40)	0.83 (0.62, 1.10)	0.88 (0.59, 1.30)	**0.55 (0.35, 0.86)**
Low parental involvement	1.54 (1.18, 2.00)	**1.99 (1.69, 2.35)**	**1.62 (1.30, 2.01)**	**1.71 (1.39, 2.09)**
Alcohol misuse	1.20 (0.89, 1.61)	**2.02 (1.57, 2.59)**	**1.81 (1.39, 2.35)**	**1.47 (1.07, 2.00)**
Hunger	1.16 (0.91, 1.48	1.09 (0.87, 1.36)	1.18 (1.00, 1.41)	1.17 (0.89, 1.60)
Drug use	1.30 (0.92, 1.84)	**1.60 (1.18, 2.16)**	1.15 (0.87, 1.51)	**1.84 (1.35, 2.50)**
Tobacco use	**1.49 (1.09, 2.05)**	**1.82 (1.41, 2.36)**	**1.38 (1.10, 1.74)**	**2.47 (1.76, 3.42)**
Physical fighting	0.90 (0.69, 1.19)	1.06 (0.87, 1.29)	1.07 (0.91, 1.26)	1.06 (0.75, 1.51)
Physically attacked	**1.49 (1.14, 1.95)**	**1.72 (1.43, 2.07)**	**1.49 (1.26, 1.76)**	**1.47 (1.07, 2.01)**
Bullying victimization	**2.13 (1.64, 2.76)**	**1.97 (1.66, 2.34)**	**1.70 (1.37, 2.10)**	**2.48 (1.83, 3.35)**

Truancy	**1.25 (1.01, 1.56)**	**1.33 (1.09, 1.63)**	1.12 (0.94, 1.32)	**1.49 (1.18, 1.89)**

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```
!!!
```

```
keep  q1 q2 q6 weight psu stratum qn24 qn25 qn26 q26 q55 q56 q57
QNANYTBG qn53 qn39 qn20 qn17 qn16 qn15 q40;
RUN;


  **recode suicide variables;
DATA all;
  SET all;

 think = .;
  IF (QN24=1) and (QN25=2) THEN think = 1;
  IF (QN24=2) THEN think = 0;

plan= .;
  IF (QN24=1) and (QN25=1) THEN plan = 1;
 IF (QN25=2) THEN plan = 0;


attempt=.;
IF (Q26=3) THEN attempt=0;
IF (Q26=4) THEN attempt=0;
IF (Q26=5) THEN attempt =0;
IF (Q26=1) THEN attempt=0;
IF (Q26=2) THEN attempt=1;


attemptmul=.;
IF (Q26=3) THEN attemptmul =1;
IF (Q26=4) THEN attemptmul =1;
IF (Q26=5) THEN attemptmul =1;
IF (Q26=1) THEN attemptmul=0;
IF (Q26=2) THEN attemptmul=0;
run;



proc freq data=  all;
table think plan attempt attemptmul /missing;
run;


**recode parental involvement variable;;
DATA all;
  SET all;
 parental = .;
  IF (Q55=1) or (Q56=1) or (Q57=1) THEN parental = 1;
  IF (Q55=2) or (Q56=2) or (Q57=2) THEN parental = 1;
  IF (Q55=3) or (Q56=3) or (Q57=3) THEN parental = 0;
 IF (Q55=4) or (Q56=4) or (Q57=4) THEN parental = 0;
  IF (Q55=5) or (Q56=5) or (Q57=5) THEN parental = 0;

Run;

proc freq data=  all;
table parental /missing;
run;
```

```
**recode hunger variable;;
DATA all;
  SET all;
 hunger = .;
IF (Q6=1) then hunger =0;
IF (q6=2) or (Q6=3) or (Q6=4) or (Q6=5) then hunger =1;
Run;

proc freq data= all;
table hunger /missing;
run;



*recode gender to be 1=male,0=female ;;;
 DATA all;
  SET all;
   gender=.;
  IF (q2=1) THEN gender = 1;
 if (q2=2) then gender =0;
Run;

proc freq data= all;
table gender /missing;
run;



**recode age ;;

proc freq data=all;
table q1 /missing;
run;

DATA all ;   SET all ;

age=.;
if (q1=1) then age=0;
if (q1=2) then age=0;
if (q1=3) then age=1;
if (q1=4) then age=2;
if (q1=5) then age=3;
if (q1=6) then age=4;
run;


proc freq data=  all;
table   age /missing;
run;



**recode all dichotomous variables;;
DATA all ;   SET all ;
tobacco=.;
if (QNANYTBG=1) then tobacco=1;
```

```
if (QNANYTBG=2) then tobacco=0;
run;

DATA all ;   SET all ;
truacy=.;
if (qn53=1) then truancy=1;
if (qn53=2) then truancy=0;
run;

DATA all ;   SET all ;
drink=.;
if (qn39=1) then drink=1;
if (qn39=2) then drink=0;
run;

DATA all ;   SET all ;
bully=.;
if (qn20=1) then bully=1;
if (qn20=2) then bully=0;
run;


DATA all ;   SET all ;
fight=.;
if (qn16=1) then fight=1;
if (qn16=2) then fight=0;
run;

DATA all ;   SET all ;
attack=.;
if (qn15=1) then attack=1;
if (qn15=2) then attack=0;
run;


 proc freq data= all;
table tobacco truancy drink bully fight attack /missing;
run;


*add id variable bolivia (3696), costa rica (2679), jamaica (1623),
peru (2882), suriname (1698) ;
DATA  all;
  SET all;
      id = _N_;
  RUN;

DATA all;
  SET all;
 location = .;
  IF (id <3697) THEN location = 0;
IF (3697=< id =< 6375) then location=1;
IF (6376=< id =< 7998) then location=2;
IF (7999=< id =< 10880) then location=3;
IF (id > 10880) then location=4;
run;
```

```
proc freq data=  all;
table location  /missing;
run;


**recode drugs variable;;
proc freq data=all;
table q40 /missing;
run;

DATA all ;   SET all ;
drugs=.;
IF (q40=1) then drugs=0;
IF (q40=2) then drugs= 1;
IF (q40=3) then drugs= 1;
IF (q40=4) then drugs= 1;
IF (q40=5) then drugs= 1;
IF (q40=6) then drugs= 1;
IF (q40=7) then drugs= 1;
run;


proc freq data=  all;
table drugs  /missing;
run;



*label variables;
DATA all;
SET all;
LABEL
age = 'age'
gender = 'gender'
hunger = 'hunger'
bully = 'bully'
think= 'suicidal thinking'
plan= 'suicide plan'
attempt ='suicide attempt'
attemptmul = 'multiple attempts'
parental= 'low parental involve'
tobacco= 'tobacco use'
truancy= 'truancy'
drink= 'problem drinking'
bully= 'was bullied'
location= 'country'
fight= 'physical fight'
attack= 'attacked'
drugs= 'drug use'
Weight = 'weight'
PSU = 'psu'
Stratum= 'stratum' ;

RUN;

proc format ;
```

```
value gender
1= 'male'
0= 'female';

value YN
0= 'no'
1= 'yes' ;

value location

0= 'bolivia'
1= 'costa rica'
2= 'jamaica'
3= 'peru'
4= 'suriname';


value age
0= '12 and younger'
1= '13 years'
2= '14 years'
3=  '15 years'
4= '16 and older';

run;


proc freq data=all;

format
age age.
gender gender.
parental yn.
think yn.
plan yn.
attempt yn.
attemptmul yn.
hunger yn.
drugs yn.
tobacco yn.
truancy yn.
location location.
drink yn.
bully yn.
fight yn.
attack yn.;


proc freq data=all;
tables  gender hunger parental think plan attempt  age attemptmul drugs
tobacco truancy drink bully fight attack location  /missing;
run;


*bivariate analyses by country;;
proc surveyfreq data=all ;
strata stratum ;
```

```
cluster psu ;
weight weight ;
tables location*gender   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*hunger   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*parental   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*think   /chisq row;
run ;


proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*plan  /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*attempt   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*attemptmul  /chisq row;
run ;


proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*age   /chisq row;
run ;

proc surveyfreq data=all ;
```

```
strata stratum ;
cluster psu ;
weight weight ;
tables location*drugs   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*tobacco   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*truancy   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*drink  /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*bully   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*fight   /chisq row;
run ;

proc surveyfreq data=all ;
strata stratum ;
cluster psu ;
weight weight ;
tables location*attack  /chisq row;
run ;

***crude analysis;;

PROC SURVEYLOGISTIC data=all;
Model think (descending) = gender ;
STRATA Stratum;
CLUSTER PSU;
WEIGHT Weight ;
RUN;
```

```
PROC SURVEYLOGISTIC data=all;
Class location (ref='2' param=ref);
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Overcoming Barriers to Disinfection in Hospitals

[redacted]

HNSC 7171

Professor Eastwood

Spring 2015

Purpose & Type of Evaluation

Hospital-Acquired Infections/Healthcare-Acquired Infections (HAIs) or Nosocomial Infections (NIs) have become a major problem in many healthcare settings in the United States (Healthy People 2020), but are also some of the most preventable causes of death in the U.S. (Krein, Kowalski, Hofer, & Saint, 2011). HAIs are infections that patients can pick up when receiving treatment for medical or surgical problems. The spread of these infections are worsened by increasing numbers of antibiotic-resistant bacterial strains such as methicillin-resistant Staphylococcus aureus (MRSA) (Muniz, Sethi, Zaghi, Ziniel, & Sandora, 2012), which make infections harder to treat. MRSA can survive on inanimate objects and surfaces (Maki, 2014) for as short as 18 hours to as long as 7 months (Muniz et al., 2012; Shaw & Cooper, 2014). HAIs are a common cause of morbidity and mortality in hospitalized patients and 1 in 20 or about 5-10% of hospitalized patients may develop infections during their stay (Bandi & Conway, 2012; Rehman, Razzaq, & Owais, 2011). These infections lead to yearly increases in healthcare expenditures and cost the healthcare system $45 billion each year (Sharpe & Schmidt, 2011). HAIs can be found in acute care hospital settings, same-day surgical centers, ambulatory outpatient care in health clinics, and long-term care facilities such as nursing homes and rehabilitation centers (Healthy People 2020).

Proper hand hygiene (Mermel, 2010) and proper cleaning of medical equipment, such as stethoscopes, are essential in preventing the spread of HAIs. The problem though is that although many healthcare workers know they should be washing their hands often and disinfecting their stethoscopes and other medical equipment, large numbers of them still do not do so or do not do so as often as they should. Surveys have shown that 70-90% of physicians do not disinfect their

stethoscopes after each patient (Longtin et al., 2014). Another study found that 76% of respondents (healthcare workers) believed that their stethoscope could be a vector for disease, yet only 24% actually disinfected their stethoscope after each patient (Muniz et al., 2012). Thus, compliance by doctors, nurses and other healthcare workers has become an issue (Saloojee & Steenhoff, 2001). Some research has shown that the design of healthcare settings can either increase the chances of spreading the infections or can help prevent them from spreading (Hamilton, 2012).

Various interventions have been experimented with in order to determine the most effective form of disinfection for hands or stethoscopes. Stethoscopes are one of the most commonly used medical devices and because it makes multiple patient contacts throughout the day, it increases the chance of spreading HAIs (Jain, Shah, Jain, & Sharma, 2013). Isopropyl alcohol has been found to be most effective in reducing bacterial counts (Rehman et al., 2011), and alcohol wipes are the most commonly used form of disinfectant (Alspach, 2014). However there are often barriers in attempting to disinfect. Healthcare workers have stated that barriers that prevent them from cleaning as often as they should include time constraints, inconvenient location/absence of hand-washing/cleansing stations, and lack of visual reminders (Shaw & Cooper, 2014; Alspach, 2014). Lack of funds may be another barrier at some facilities. Some research has been done to determine if simultaneous washing of hands and stethoscopes with an alcohol-based cleanser, such as a foam or gel is an effective method of disinfection (Schroeder, Schroeder, & D'Amico, 2009). Although alcohol wipes may be effective in cleaning stethoscopes, they are not always readily available (Alspach, 2014). Therefore, replacing alcohol wipes with alcohol-based foams or gels may be helpful for healthcare workers in overcoming some of the barriers they face when it comes to disinfecting their stethoscopes and hands. In

addition, measures should be taken to reduce the time it takes for healthcare workers to disinfect and more signs should be placed reminding them to disinfect frequently (Alspach, 2014).

In order to determine if an intervention is effective, process and outcome evaluation is needed. Process evaluation is helpful for observing and recording the implementation of programs and can be useful in comprehending the elements of a program and its outcomes (Saunders, Evans, & Joshi, 2005). Outcome evaluation is focused on the more immediate effects of a program. Process evaluation helps to determine what was successful or unsuccessful in an intervention and why (Saunders et al., 2005). There are different elements used to measure process evaluation. The intervention discussed in this paper will include the measurement elements: reach, context, dose received, and recruitment. Reach is defined as the target audience that participates in the intervention, or the participation rate. Context has to do with the environment surrounding the program/intervention and the influence it has on the program/intervention. Dose received has to do with the information participants in the program/intervention received and the extent to which that information is continued after the intervention is completed. Recruitment is defined as the procedures used to draw participants to the intervention.

Evaluation Questions

This intervention and evaluation will seek to determine the barriers experienced by healthcare workers when it comes to disinfecting their medical equipment and/or their hands. What are the barriers? Depending on the answers given, why do healthcare workers think these are barriers for them? Is it time constraints? Is there a lack of materials for disinfection? Are wash stations placed at inconvenient locations? Is there a lack of funds? The purpose is to ask

healthcare workers what the biggest issues are for them and then to implement various changes to try to overcome the problems. The long-term goal of the intervention is to reduce/eliminate HAIs and improve health.

For this intervention, reach will be useful in determining the number of participants (healthcare workers) that were involved in the intervention after being recruited. Looking at context will be helpful in determining which factors could affect implementation or outcome. For this intervention context will involve looking at the physical environment in which the healthcare workers work and how it affects the intervention. Dose received will be important in measuring the success of this intervention. It will involve determining whether healthcare workers make changes once they are exposed to the intervention and if there is continued use of knowledge once the intervention is complete. Recruitment will be useful for measuring success of the intervention by recording the recruitment procedures used and then looking to see if the methods used were effective at bringing participants into the intervention.

Evaluation Design

This intervention will be a non-experimental pre-test post-test design. This design means that there will be a stage of measurement (a questionnaire), followed by the intervention, and then another measurement stage (another questionnaire). The population that will be receiving the intervention are healthcare workers in hospitals in Brooklyn, New York. Their contact information will be gathered from hospital distribution lists of doctors and nurses. Potential participants will be contacted through email and asked if they would be interested in participating in a study with the long-term goal of reducing HAI rates. Specifics about the intervention will not be revealed so as to protect the study from bias and to avoid giving potential

participants any pre-knowledge of what they will be doing, which also protects the study. The email will state that the participants' identities will remain anonymous in order to protect them should they choose to participate and that no one other than those conducting the intervention will see their results. In addition, the supervisors in those same hospitals where emails will be sent to doctors and nurses will also be contacted. The purpose of contacting the supervisors is to explain the scope and magnitude of the HAI problem and to have them encourage or require their doctors and nurses to take part in the intervention. The supervisors would also be contacted through email. Hospitals have infection control departments whose general mission it is to protect patients, healthcare workers, and visitors from risk of transmission from infections. Infection control departments would also be contacted for the purpose of establishing what type of infection control program they have and to inquire about collaborating with them for a seminar for the intervention.

The first step of the intervention is to conduct a survey (pre-test) of the healthcare workers. The survey will include questions about hygiene habits such as how often they wash their hands throughout a normal workday and when they wash, such as before and/or after examining a patient. The survey will also have a component asking about barriers that may prevent them from being able to practice proper hygiene, such as inconvenient locations for wash stations. The survey will consist of multiple choice and free-response questions and will be sent via email. The purpose of sending the survey through email is to make sure the healthcare workers are in a comfortable environment when answering and that they feel safe and not concerned about others seeing their answers. Although it is possible that healthcare workers may not be completely honest in their answers for the purposes of social desirability, past studies have found results that were not so flattering for healthcare workers when they were surveyed about

disinfection habits. This implies that they were mostly honest and could suggest that at least some of the respondents for the current intervention will answer somewhat truthfully.

The next step after the survey will be to implement changes based on the feedback from the survey (the intervention). If the healthcare workers state that the problem is inconvenient location of wash stations or lack of time, the solution will be to place wash stations outside of exam rooms. If they state that there is a lack of visual reminders, the change will be to put up posters and signs to remind them. If they express that the problem is lack of funds for supplies for cleaning hands or medical equipment, a simultaneous scrubbing of hands and stethoscopes with an alcohol-based cleanser would be the implemented solution.

In addition to the various changes made, there will also be the implementation of an education seminar. This will be done in collaboration with the already existing infection control departments in the hospitals. If there is already an informational session that exists, the material will be reviewed and decided if it should be included as is or if adjustments should be made to improve the quality of the material. The session will be a one-time course held over 3-4 hours and will discuss the impact of HAIs on the healthcare system and what it means for the future of healthcare. It will also include basics on hand washing and disinfection of stethoscopes and other medical equipment, and statistics on the number of patients affected and what could happen if the problem is not resolved. Healthcare workers who elected to take part in the pre-test survey will be expected to attend the session, and there will be multiple sessions, if necessary, to ensure that everyone is able to attend.

The evaluation component of the intervention will have two parts. The first part will be a follow-up survey (post-test). It will include questions about whether or not hand washing and hygiene practices have improved since the implemented changes. Questions will be asked in

order to determine if there have been increases in good habits and if the changes have a positive impact or not. Also, and importantly, the evaluation will elicit suggestions that the healthcare workers themselves might have to impeove good hygiene habits further. The second half of the evaluation will be to look at the numbers of patients with HAIs and compare them to baseline figures to see if there has been any improvement since the implemented changes. If the numbers show a decrease, it could be assumed that the changes made were effective in reducing HAIs. If the numbers stay the same or increase, more work will then be needed in order to fix the problem.

Data Collection Methods

Sources of Data—As stated above, data will be collected from healthcare workers such as doctors, nurses, and nurse assistants in hospitals. Data will be collected by questionnaires (pre- and post-test) that will be administered via email. The purpose of administering through mail is to ensure the participants are comfortable while answering and are able to complete it at a point when they are not busy and it will not interfere with their work.

Examples of Measures to be Collected—This intervention will seek to determine the barriers that healthcare workers experience when trying to disinfect their hands and medical equipment. The reach measurement will be helpful in determining if there were a sufficient number of participants involved in the intervention (the surveys with the changes made and the education seminar). Reach will involve looking at the numbers of participants recruited for the intervention and the numbers of participants that were involved until the end. The context measurement will be useful in determining if the changes made in the intervention in order to overcome the barriers stated by healthcare workers in the pre-test survey were helpful and actually led to changes in

healthcare workers' behavior. Dose received is a helpful measurement because it will look at and determine if the participants (healthcare workers) learned from the intervention and continued using that information after the close of the intervention. Did the changes made to overcome the disinfection barriers help and have they continued to improve the frequency of disinfection after the intervention ends? Was the education seminar successful in that healthcare workers accumulated knowledge and continued practicing proper hygiene after learning the correct way? The recruitment measurement will help establish if the process used to draw participants to the intervention was successful. A large number of participants may indicate that the recruitment procedures were effective.

Staffing

Staff will be needed in order for the intervention to function. A team of about 7-12 people (team #1) will be needed on a part-time basis (.5 FTE). These people will be in charge of developing the surveys (pre- and post-tests), contacting supervisors and healthcare workers via email for recruitment, either creating original or gathering existing visual reminders about hand washing, implementing/helping to implement the changes needed to overcome the disinfection barriers, and conducting the evaluation of the intervention once completed. These people will be needed for 1-2 weeks prior to the start of the intervention, on and off throughout the intervention, and then 1-2 weeks once the intervention has ended in order to evaluate the effectiveness of it. Once staff have collected basics on infection control departments in the hospitals and established what types of programs they provide, other staff will be needed for the education seminar portion of the intervention. The staff needed for the education seminar (team #2) will consist of a team of 6-10 people working on a part-time basis (.5 FTE). They will also be needed 1-2 weeks prior to

the start of the intervention in order for planning to take place. Most of these staff should be experts on disease infection or have some knowledge about infection and proper hygiene practices. They will meet with the infection control department to determine if there is already an existing educational seminar in existence and if it needs tweaking or not or if a session needs to be developed. From team #2, 1-2 staff will be chosen to teach the seminar (possibly in conjunction with those from the infection control department). These 1-2 staff members will be needed for 3-4 hours at least once (more than once if multiple sessions need to be scheduled in order to ensure everyone is able to attend). As many staff as possible from both team #1 and team #2 will be asked to participate in the evaluation portion of the intervention which will take 1-2 weeks to complete. The evaluation portion may require staff to be present full-time (FTE). An office space with at least 2-4 rooms will be needed for the planning and evaluation stages.

In literature, belief of first. What is the presence of stethoscope - borne infection? Staffing can be drastically reduced to the existing infection control staff

You must order MDs & RNs to attend sessions pre-intervention. Post-test can be handled by other staff.

This keeps getting better!

24/30

Appendix

Logic Model—Overcoming Barriers to Disinfection in Hospitals

Your Planned Work		Your Intended Results		
Resources/Inputs →	**Activities →**	**Outputs →**	**Intermediate Outcomes →**	**Long Term Outcomes**
• Staff: (1) Those responsible for putting together the survey (2) Those responsible for creating visual reminders (3) Those responsible for helping to implement the changes to overcome the barrier issues (these people may either be in contact with people from organizations that can contribute resources or money or may work directly for those organizations) (4) Those responsible for preparing the education seminar (5) Those responsible for speaking/presenting at education seminar (6) Those responsible for creating the post-intervention survey (7) Those responsible for contacting and	• Survey of healthcare workers (questions about hygiene habits, barriers experienced preventing them from disinfecting) • Implementation of changes based on feedback from survey (to fix barrier issues) • Education seminar for healthcare workers (basics on hand washing and disinfection of stethoscopes and other medical equipment, information on impact of healthcare acquired infections (HAIs) on healthcare system and patients) • Follow-up survey (questions on	• # of healthcare workers involved in the intervention • # of healthcare workers who practice proper hygiene as a result of intervention • # of patients that did not develop an HAI due to the intervention (when compared to numbers of patients infected in previous years) • Changes in hygiene practice (measured by pre- and post-test surveys	• Better hygiene practice among healthcare workers (more consistent hand washing and disinfecting of medical equipment) • Less patients becoming infected and less bacteria being transferred • Healthcare workers attitudes and awareness towards practicing proper hygiene has improved and more are conscious about how often they clean their	• Reduction in numbers of HAIs or elimination of them altogether (in the hospitals involved in the intervention) • Better hygiene practice among healthcare workers (more consistent hand washing and disinfecting) measured by pre- and post-test surveys and also by numbers of patients infected or not infected

recruiting site supervisoes at hospitals and contacting healthcare workers to participate (8) Those responsible for conducting evaluation of the intervention • Money to pay staff for (1) Their time involved in the intervention (2) Time spent developing surveys (3) Time developing and working with infection control department to create education seminar (4) Working the education seminar (5) Working to help implement the changes to overcome disinfection barriers • Money to purchase office supplies • Location to hold planning meetings: to serve as a home base	changes and improvement in hand washing and disinfection practice since intervention and suggestions from healthcare workers about how to improve hand washing and disinfection practices further) • Comparing baseline figures of patients with HAIs to numbers taken after completion of intervention		hands and medical equipment	

during intervention and evaluation				

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Accountable Care Organizations

Brooklyn College

[redacted]

April 28, 2014

INSC 7142

Abstract

Accountable care organizations (ACOs) are one of the organizational models that the Centers for Medicare are promoting in the Affordable Care Act to reduce cost, improve quality and provide access to care. Implemented in 2012, ACOs have been forming at a rapid pace with over 700 ACOs formed thus far. ACOs have a unique payment structure that involves providing incentives to providers who save money to the Medicare program by improving quality of care. This paper will focus on ACOs and how they are beneficial and some of the challenges that they can face.

One of the goals of the Affordable Care Act (ACA) is to address the issue of quality, cost and care. Around 49.9 million Americans were uninsured in 2010, before the major provisions took effect. Those that tended to be uninsured were those ages 18-34, minorities (Hispanic, Black and Asian populations) and those that did not have employer-sponsored insurance (Wilson, 2014). In 2011, the United States (U.S.) spent an average of 2.9 trillion dollars on medical care, making it one of the only industrialized nations in which it's GDP (17.9%) is mostly made up of medical care. The U.S. does not guarantee access to health care for its population even though it ranks high in medical developments and innovations (Cowen, 2006). Contributing to this problem is that the U.S. healthcare system has a fragmented medical care system in which prices are not governed by a one-payer system as in countries that have universal health care coverage (such as Canada and England). One of the solutions is the formation of an Accountable Care Organization (ACO) and the potential to achieve access, quality and cost control.

Accountable Care Organizations (ACOs)

Implemented in 2012, accountable care organizations has the potential to improve quality of care by providing high- quality services across a broad spectrum of services from primary care physicians, specialists to hospital care and ancillary services by creating partnerships with these entities for a defined patient population. Physicians and the ACO would be held accountable for all costs that are generated and can share in any savings that are saved in the form of financial incentives. Certain benchmarks would have to be met in order to qualify for any incentives. There are 33 established quality measures in four categories that would have to be met. Among them are patient and caregiver experience (7 measures), preventative health (8 measures), care coordination (6 measures) and healthcare for at-risk populations (5 measures) and much more

(CMS.gov). There has to be a minimum of 5,000 participants that it serves for at least three years.

Currently, there are two types of ACOs offered by CMS for Medicare beneficiaries, Pioneer and MSSP, of which an ACO decides which risk model to assume. Pioneer ACOs operate under a shared savings model (two-sided risks) in the first two years. In the third year, payment can begin to move from fee for service to capitated payment or global payment system that can continue into a fourth and fifth year. The Pioneer model is for organizations that have experience already in capitation, risk management (from HMOs experience) and patient populations. The Pioneer model has more stringent rules for participation than the MSSP model (Stenson & Thompson, 2013). The MSSP model is a three year contract and has two risk sharing options. The MSSP share in savings but not losses (one-sided risks) or share in both savings and loses (two-sided risks) (Burke, 2013, p.7). The differentiation is that the Pioneer model gets more return (and thus more risks) for hitting benchmarks, but would have to pay CMS any loses that it incurred.

ACOs can be big organizations that can handle large populations of patients on Medicare. An ACO can be made up of many medical practices, of which many providers and practices work together. An ACO can consist of a hospital, multi-specialty practice, post-acute care, and any health care costs generated by the defined population, including "out-of-network utilization, home health, nursing home care, pharmacy costs, medical equipment" and even long-term care. (Burke, 2013, p.3; Glenn, 2012). Costs are contained by having partnerships with multiple physicians, specialists, hospitals and ancillary services with an ACO so that patients do not have to bounce around to different providers and possibly ordering the duplicate tests. Patients can have their care coordinated with interdisciplinary providers communicating the patients' current

and past health status. Care providers are jointly held liable for the care of the patient and must achieve quality measures. Primary care physicians can be a part of more than one ACO (Glenn, 2012). An ACO differs from an HMO in that patients do not have to select a primary care doctor but can see any freely (Burke, 2013). Also, the HMO Act of the 1990s emphasized coverage of care and not delivery, resulting in more types of insurance coverage while not addressing health care quality (Burke, 2011). ACOs have a pay per performance component. Successful ACOs have the ability to be models for other ACOs and introduces transparency. According to the ACA's "statutory requirements, members of an ACO will indeed be required to transparently share their performance data on quality measures being used to assess performance" (Burke, 2011 p. 877). CMS also defined evidence-based medicine to be included in the practice of care. Providers would be encouraged to use current best evidence in making decisions based on thoroughly vetted research.

Savings

It is too early to gauge whether the ACOs that are forming under the ACA is meeting benchmarks or receiving any returns especially those that are still forming (Lewis, Colla, Carluzzo, Kler, & Fisher, 2013). Currently, there are "744 ACOs that now exist in all 50 states and cover 23.5 million people in the United States" however, that includes commercial ACOs which outpace Medicare by four to one (Leavitt Partners, 2015; Stenson & Thompson, 2013). It is hard to gauge the cost savings in the commercial ACOs compared to Medicare's because it is not a requirement to report to CMS. One study found that commercial ACOs had costs decrease by 2-12% (Peterson, 2014). Another study found that out of 32 Pioneer ACOs, they generated a cost savings of $147 million in the first year of service to the Medicare program (Leavitt Partners, 2015). Of course, this all varies according to the conditions of the ACO (geographic

location, size, structure, average spending on Medicare patients in that region) and how much they can save. A study done in 2012 found that ACOs formation was uneven and were more likely to form in high cost areas and high performing in quality measure and less likely to form in rural areas and areas of poverty (Lewis, Colla, Carluzzo, Kler, & Fisher, 2013). This could pose a problem because ACOs would be picking where they get the most incentives and not caring for the population that do not have access to healthcare and are thus sicklier. As of right now, there is no concrete evidence of how the new ACOs are performing (or saving) under the ACA Medicare guidelines since it is year three of implementation.

Legality

Another issue is the issue of if the formation of an ACO is legal under antitrust laws that could reduce competition and be subject to price fixing. There are certain protections for those under the shared savings program such as making a safety zone that is evaluated by CMS to make sure that anticompetitive effects are not taking place. A safety zone would be created that "reflects the view that they are highly unlikely to raise competitive concerns" (Federal Trade Commission/Department of Justice, 2011). Contracts cannot be made for private payers to exclusively pay an ACO. An ACO can get a rural exemption if a physician that participates in one has a practice in a rural area (which is determined by zip code). ACOs would need to make sure that they are compliant with the guidelines in order to be qualified.

Implementation Problems

A few problems with this model can arise with implementation. An ACO needs an estimated $600,000 in startup expenses and at least 1.3 million a year in administrative expenses (Glenn, 2012). If the organization were successful by reducing cost of care and generated savings, there would have to be clear delineations of how that savings is spent- in the

organization or to pay physicians. This would be a problem if the ACO has many parties involved.

There needs to be infrastructure and maintenance available. There has to be the health information technology (HIT) infrastructure available to monitor and measure if benchmarks are met. The infrastructure would have to be able to communicate and work across multiple computers and devices while making sure that it is efficient. Besides having electronic medical records available, much more IT infrastructure would have to be installed to complement it such as registries, e-prescribing, patient portals, quality monitoring, etc. A practice may want to add on tele-monitoring, e-mail, and video conferencing to increase access to care. Possibly adding more walk-in hours and weekend and holiday services would be an option. One study estimated the cost savings to be about $77 billion a year in inpatient and outpatient care because of its high efficiency in care coordination (RAND Corporation, n.d.). HIT technology also can prevent medical errors, medication errors and make sure that patients receive tests or services.

ACOs would have to decide on how to deal with providers who are not meeting benchmarks for care. An ACO can have a large amount of staff and would need to decide how to train and make sure providers are not over prescribing care or lacking in care. Administration would have to have a protocol on what discipline or training would need to be done for those identified providers. Ideally, HIT infrastructure would be able to identify and stop duplicate tests and make sure that certain criteria are met, but technology cannot be relied on upon solely.

Providers would have to view revenue a different way. The traditional fee-for-service model pays for services performed (which would still be used in the ACO model), which was an incentive to provide more. However, utilization of tests, procedures, visits would be viewed as costs as opposed to revenue. A physician would have to tailor his/her practice to the usage of less

services but making sure that adequate amount is performed for the proper diagnosis/purpose. A potential problem would be that a physician might feel under pressure to skimp on services or tests for their patient in order to save costs. This can be remedied by having a strong administration and care team to cross check care for each patient. And lastly, physician culture would have to shift to accept ACOs and being accountable for care. Physicians would have to shift attitudes favoring autonomy and individual accountability towards coordination of care with other providers (teamwork aspect) and accept responsibility.

And lastly, even though providers would have to change their practices, the issue of patient behavior also plays a role. ACOs would have to figure out how to engage the participants into coming into their practice for care especially those that are healthy (such as those in their prime years). Patients who are fairly healthy do not want to frequently travel to health centers if they deem that it is unnecessary. Some ethnicities (such as Blacks) have a mistrust of doctors and may not go see a doctor until a health condition worsens. Being that participation is voluntary, those that deem it too invasive and a waste of time may drop out and go elsewhere which could affect the statistics.

This paper only highlights some of the issues that could affect the outcomes for achieving access, quality, and costs and there are many more that would have to be factored. It is too early to gauge whether ACOs under the Medicare Pioneer or MSSP is achieving those goals but earlier analysis shows it to be quite promising in cost savings.

(RAND is a policy body - but details of how HIT works is beyond the scope of your paper.)

Many fine points. Some parts not really policy (HIT) & you'll learn to debate these big issues that you began to address!

A—

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Screening Brief Intervention and Referral Treatment (SBIRT) Implementation Plan in six Federally Qualified Health Centers (FQHC) in New York State

CUNY SPH
Brooklyn College Campus
Course 7141
Fall 2015

Introduction

This document presents an implementation plan for Screening, Brief Intervention and Referral to Treatment (SBIRT) approach for patients 18 years and above at risk for alcohol misuse across six federally qualified health centers (FQHCs) in New York State (3 rural and 3 urban).

Rationale

According to national statistics, untreated alcohol problems cost the United States an estimated $134 billion annually (SBIRT Colorado, 2015). In addition, excessive drinking was responsible for 10% of deaths among adults of working age aged (20-64 years). The Affordable Care Act (ACA) will expand coverage for medical and behavioral health insurance to over 14 million people in efforts to prioritize preventative services for underserved communities, including substance use disorders services such as screening, brief intervention and referral to treatment (SBIRT) (CBO, 2012). Federally Qualified Health Centers (FQHCs) will serve as the "primary care home" and the "public health gatekeeper" for the newly insured and will receive funding to lead preventative interventions in behavioral and physical health (Adashi, 2010).

SBIRT is an evidence-based practice used to "identify, reduce and prevent problematic use, abuse, and dependence on alcohol and drugs" (SAMHSA, 2015). The United States Preventive Services Task Force (USPSTF) recently updated their recommendations to include universal screening for all adults ages 18 years or older for alcohol misuse and provide brief behavioral counseling intervention to reduce alcohol misuse (Moyer, 2013). Using SBIRT in FQHCs will allow us to systematically screen and identify individuals who otherwise might not be seeking help harmful alcohol use as well as to reduce and prevent dependence (SAMHSA, 2015). As such, the Screening, Brief Intervention and Referral to Treatment (SBIRT) plan is one of the best approaches to move these goals forward. SBIRT provides effective strategies for intervention to target those with non-dependent substance use. SBIRT is not intended for the specialized group of individuals that meet the criteria for diagnosis of a substance use disorder.

In primary care settings, the use of counseling interventions has been found to reduce unhealthy alcohol consumption behaviors in adults identified as engaging in risky or hazardous behavior. There are a variety of behavioral counseling interventions that may vary in the mode of administration, length, and a number of other factors but evidence suggests that brief multicontact behavioral counseling has the highest level of effectiveness (SAMHSA, 2005). The separate phases of our implementation plan will be guided by the Fixsen model of implementation, which include 4 core stages: exploration, program installation, initial implementation and full implementation (Fixsen et al., 2005).

Design:

The expected total population undergoing screening brief intervention referral to treatment approach would be about 30,000 adults in total over the course of one year. This number is based on 8,000 adult visitors to each urban health center and 2,000 visitors to each

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Commented [SJH3]: Remember SBIRT only recommended for patients identified with harmful alcohol use-not for more serious conditions (either alc or drug)

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Commented [SJH6]: this is where it is effective and what it does .but also need to address in this section why important (

Commented [SJH7]: need to clarify ..refer to the pyramid (McLellan et al.) that I used in lecture .only a small % of patients qualify as harmful users so not all 30,000 will receive SBIRT your process flow gets to it but the read is confusing until then ... All may receive screening-but most will not receive screening, some will be identified as harmful alcohol consumers and should proceed to BIRT, the rest will either qualify for less consumption (get no more services) others with higher drinking (referred to treatment). Throughout this plan need to clarify who does what and gets what, when.

rural center. The SBIRT Project team will consist of five members from each of the participating Federally Qualified Health Centers and one specialist from a contracted agency. Members include (1) intake receptionist, (1) medical assistant, (1) physician/ nurse practitioner/physician's assistant and a (1) behavioral therapist. The implementation process will contain four phases and the timeline for implementation is set for two years (24 months). The four phases of the implementation will consist of:

1. EXPLORATION 1-3 months
   Resource Assessment
   Staff Evaluation: Baseline measures
   Program Evaluation: Baseline Measures
   Systems Interventions: EHR Medical Records
   Facilitative Administrative Supports:
   - Off-site SBIRT training
2. INSTALLATION 3-9 months
   On-Site Training and simulation
   Selection: Sites 3 Rural and 3 Urban
   - Train-the-trainer led by urban site
   - Train-the-trainer led by rural leaders
3. INITIAL IMPLEMENTATION 9 -18 months
   Preservice Training: On-site training and implementation
4. IMPLEMENTATION 18- 24 months
   Pre-screening, SBIRT and follow-up are running smoothly and gaining traction in the patient population.

The SBIRT process will be directed by an external agency tasked with leading the off-site trainings, facilitating the on-site trainings, providing an advisory role in the train-the-trainer models and closely working with the FQHC in the evaluation phase.

Phase 1: Exploration

The exploration phase will assess what resources are available in terms of human capacity to take on the roles needed for implementation, the existence of computer infrastructure, space at the center or other built environment resources necessary to implement the SBIRT process. Finally, the assessment will look to see if the technological capabilities (EHR and online access to SBIRT training) are available on the operating systems within the FQHC. In addition to an assessment phase 1 will train the participants, provide the evidence for the SBIRT approach and introduce them to the Electronic Health Record interface for inputting data and information if they are unfamiliar with the interface. In addition to introducing the participants to the content and technology associated with SBIRT, the off-site training will focus on the importance of creating a learning culture within the organization and creating relationships with off-site rehabilitation centers. It will introduce the proper sequence for SBIRT delivery and note key barriers to implementation. After completion of the off-site training participants will be able to:

Commented [SJH8]: Who does what?

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- Understand how health centers have incorporated SBIRT service delivery into their practices.
- Assess availability of human, infrastructure and technological resources for SBIRT implementation.
- Understand the facilitators for successful implementation.
- Gain an understanding of the challenges that impact implementation of SBIRT in health centers.
- Describe potentially successful implementation models that fit with health center environment.
- Understand their role in facilitating a successful implementation model.

Phase 2: Installation

On-site SBIRT training and simulation will occur within seven days of off-site training and allow staff and clinicians to operationalize the protocols learned off-site. Many of the benefits of this implementation plan include the simulation experiences available to staff before integrating the protocol using real-time actual patient data. One of the benefits of SBIRT are the many resources that are available through SAMHSA which include online courses which are crucial for sustaining implementation when an in-person option is not available.

During the on-site portion of the education phase one urban and one rural site will be deemed a "leader" for their geographic setting and an evaluator will be selected and trained. This location will serve as the model implementation site will be able to provide the other two locations with technical assistance. All sites will receive an implementation one-page clinical summary highlighting the specific sequences for implementation and they shall have a coy posted and available for viewing by the SBIRT team.

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In addition to printed materials for the providers and staff there will also be geographically specific brochures with the information about the providers accepting referrals. Part of the on-site training will connect centers with quality rehabilitation centers to create sustainable relationships with treatment providers. Deciding which providers will also include ways of determining which transitional service providers are successful for supporting clients while waiting for admission to treatment.

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In order to prepare the organization the urban and rural leaders will assist their geographic areas with ensuring all resources and drivers necessary for implementation and will lead the train-the-trainer workshops. One of the 3 rural sites and one of the 3 urban sites will serve as trainers and lead a variation of the training in two other urban sites and the two other rural FQHC locations. This will serve as a refresher and reinforcement for the concepts learned at the off-site training and a sequencing of events for all sites. The agency will prepare staff for upcoming implementation through hand-on trainings by urban leaders, rural leaders and agency leads.

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Commented [SJH14]: Needs to be clearer –what does it mean "to prepare staff "

Phase 3: Initial implementation

To accompany the on-site trainings, simulations and implementation preservice training, the data systems will be running to assist with the updating and managing of records. Technical assistance will be available to help manage changes and ensure that pre-screening, SBIRT and follow-up are running smoothly and gaining traction amongst the providers and in the patient population.

Commented [SJH15]: More here-describe the process from a patient's experience, step by step .wait-it is below .'process map' good

Phase 4: Implementation

At this stage the center will be monitoring the process leading up to SBIRT and the resulting follow-ups. The trained evaluator from each clinic will manage this phase to determine if fidelity and outcome benchmarks are being reached. In order to improve the quality of implementation and maintain fidelity the evaluator monitor and manage the implementation drivers.

Commented [SJH16]: Good –but describe what looking for, how anticipate, how make corrections in processes etc etc

SBIRT Process Map

Commented [SJH17]: This is a solid map. Well done

Upon entering the site the intake receptionist will be the first staff person to interact with the patient, and will administer a prescreening question. This prescreening tool is the National Institute on Alcohol Abuse and Alcoholism (NIAAA) 's prescreening question ("How many times in the past year have you had 5 drinks or more in a day [for men] OR 4 or more drinks in a day [for women]?"(SAMHSA, 2013). The question will be administer along with the patient intake form and is intended to be filled out by all adult patients 18 years and above coming through the FQHC. This information will be captured in the new electronic health record modules that are part of the data restructuring for tracking, treatment and reporting purposes. The prescreening question will determine the number of times the patient consumed alcoholic beverages in a harmful way over the course of a year. Based on the prescreening results, patients will proceed directly to their as-scheduled appointment, or if they were deemed to have moderate risk of alcohol use, be directed to speak with a medical assistant who will then administer the AUDIT survey to more accurately determine level of alcohol use. Patients that score low on the AUDIT will be deemed low-risk and will receive a brief intervention with the medical doctor (MD, nurse practitioner (NP or physician assistant (PA) during their visit. Patients that score in the hazardous, harmful or possibly dependent range on the AUDIT will be directed to the behavioral therapist on site. The behavioral therapist will then make the decision to refer the high-risk patient to a rehabilitation center as per SBIRT protocol. The center will be outfitted with a template of a printable referral form to ease the referral process. The therapist will follow-up with the center directly after one month to learn about progress. Patients that are deemed to have low or moderate-risk of alcohol use will receive 3-month follow-up phone calls from the receptionist and the behavioral therapist, respectively.

After implementation is adopted, sites will use the data on percentage of adult patients screened to deliver monthly metrics to the FQHC Director of Research & Evaluation in order to evaluate adherence to the implementation and see if there are any challenging points where a brief training could be addressed.

Targets

Based on the nature of our implementation, our targeted providers will be the primary care physician, physician assistant/registered nurse practitioner, behavioral therapist, medical assistant and the intake receptionist. To furnish SBIRT services, providers who will be targeted need to be licensed or certified to perform mental health services and working within their State Scope of Practice Act.

Measures

Several measures to assess the success of the implementation of SBIRT in the six federally qualified health centers will be set. Measures will be set at each of the stages of implementation. Specific measures to assess the extent at which the SBIRT intervention is being followed will also be specified.

Implementation Stages Measures

1. Exploration: Process mapping in the form of a workflow analysis will be conducted at each clinic to assess the overall readiness of the organization to implement the SBIRT prior to full implementation. EHR's at medical centers will be assessed for readiness. A focus group will be formed to gather qualitative information regarding provider's attitudes towards the possible SBIRT implementation. The target for this stage is to set a clear implementation plan for the installation and initial implementation stages (Fixsen et al., 2005).

2. Program Installation: Active Implementation drivers such as competency supports (training, practitioner, coaching); organization supports (facilitative administration, decision support data systems) and leadership supports (technical and adaptive) will be defined (NIRN, 2015). As part of this process, performance assessment measures (fidelity) will be set in agreement with NIRN standards (2015). Performance (fidelity) assessment measures will include:

- *Context measures* will describe the necessary precursor to high-level performance
    - Training:
        - SBIRT Team members completed full SBIRT intervention training
        - Each SBIRT Team member has the ability to perform their respective portion of the intervention (i.e.: NIAAA prescreening question for intake receptionist, AUDIT screening questionnaire for medical assistant)
    - Provider's Attitudes: Staff attitudes towards the SBIRT program and training will be documented through a short survey, that asks the following question "On a scale from 0-10 (10 being the most ready), how ready are you to put in practice your portion of the SBIRT process?" The agency evaluator will collect data from this section. Target for this measure is 80% of all trained staff respond 7 or above in the survey.

Commented [SJH18]: Helpful to differentiate roles a bit

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- *Compliance measures:* will provide an outline of the core SBIRT components, their use by practitioners and staff, data collection mechanisms and patient-level expectations for each component.
    - See Appendix C - SBIRT Intervention Measures for a complete list of compliance measures for this section.
- *Competence measures:* will determine the level of skill and attention that SBIRT intervention components were delivered during interaction with patients
    - Staff member performs their respective component of the SBIRT intervention with high skill with time-sensitivity and an appropriate response to patients' contextual factors. Number of staff members that comply with this measure will be collected. Target is that at least 80% of staff members are able to identify opportunities for BI, BT and Referral.

3. Initial Implementation: At this stage, the fidelity to the SBIRT intervention will be measured once the SBIRT program is put into initial practice. The measures set at the program installation stage will be measured. As a measure of staff performance, we will determine the number of staff that meeting the fidelity assessment criteria (nominator). The denominator for this measure is the number of staff positions that are performing the SBIRT process. In terms of implementation fidelity, the degree of skill, time selection, and use of SBIRT tools and performance assessment will be measured as a system as indicated in the program installation stage.

4. Full Implementation: The full implementation stage is reached when at least 50% of practitioners and staff are using SBIRT with fidelity and good outcomes (NIRN, 2015). As such, the number of staff performing at full capacity will be collected (nominator). The denominator for this measure will be the number of staff positions performing the SBIRT process. In addition, a trained evaluator from each clinic will review the performances and workflow of the SBIRT process by observing staff directly every 6 and 12 months for a period starting at 18 months up to a maximum of 24 months expected for adoption. A standard form will be used to make detailed comments on the staff performance and provide a rating for each of the several areas of the core SBIRT intervention and prescreening. Qualitative data regarding performance, ratings and recommendations from these assessments will be promptly provided to staff. It is expected that most staff and practitioners will be performing at peak. Plan-do-study-act (PSDA) cycles will be used at this stage to ensure ongoing quality improvement and address issues through data collected and assessment of results (NIRN, 2015).

Data:

Project staff, including the agency specialist will collect quantitative and qualitative data throughout the project. NIIAAA prescreening and AUDIT screening questionnaire data will come from patient self-reporting on personal alcohol consumption and collected by the intake receptionist and medical assistant and inputted as specified in the measures. Data from brief interventions; brief therapy and referrals to treatment will log by the certified primary care physician or the certified behavioral health therapist. This information will include: the type of

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Commented [SJH24]: Good but how

Commented [SJH25]: Why did you choose 50%?

Commented [SJH26]: I am not quite getting this trained evaluator role why not someone responsible for quality and behavioral health?

Commented [SJH27]: Good – a template of the form would be ideal ..

Commented [SJH28]: This is good and introduces the need to identify lead, how know when meet goals, etc.

Commented [SJH29]: And presumably in emr?

interventions delivered to the patient, progress notes, follow up screening scores/outcomes and treatment utilization, physical and mental health symptoms or diagnosis, next scheduled screening or referrals made (SAMHSA, 2013). A specialist from the contracted agency will collect all other data regarding implementation stages and progress. Data will be collected on an ongoing basis during the implementation process will be to monitor the progress and compliance rates at six and twelve months marks and then at twenty-four months mark (at the end of the final implementation). Data will be stored at in the electronic health records, avoiding the need for a new data keeping system. Data will be pulled at the discretion of the contracted agency for evaluation purposes only. Quality assurance in data input will be responsibility of the evaluator and participating staff members, respectively. Data must be reviewed monthly in other to provide providers with the incentives and performance rewards.

To ensure provider buy-in, SBIRT will be implemented in a two-year period to elicit support and cooperation of staff and staff will be given feedback regarding performance as mentioned in the measures sections. Moreover, specific health benefits of SBIRT related to alcohol misuse will be discussed to providers and staff. Provider's concerns will be address at meetings but will also be resolved at training sessions, through ongoing direct supervision and monitoring activities (SAMHSA, 2013). Ongoing provider feedback data from the staff will also be collected from the staff as mentioned in the measure sections in order to gather information about the flow implementation process, easiness of data input to identify process issues early in implementation and generate ideas for improvement.

Data integrity will be maintained through existing confidentiality, privacy and integrity guidelines for providers and patients that are already in place at each community health center. These guidelines and provisions are maintained through the Federal Health Insurance Portability and Accountability Act (HIPAA) for guarding patient records and specifically protects the privacy of people seeking treatment for substance abuse which all six health centers must adhere to (SAMHSA, 2013). The contracted agency specialist will also adhere to equally complying integrity guidelines as part of the contractual agreement.

Costs:

Costs will be calculated based upon the presumption that the average number of visitors each year at the six FQHC is approximately 30,000. A maximum of 3,000 $ will be allocated for training purposes. This estimate will account for two training sessions per year at each of the FQHCs. For the paper-based prescreening and screening questionnaires, the proposed budget will be a maximum of 600$ per year.

Costs related to prescreening and SBIRT procedures have been calculated as follows:

The screening process conducted by the medical assistant comprising of filling in of the Prescreening is expected to be completed within one-three minutes per patient screened. Since 100% of population is to be prescreened, the total time spent by the receptionist on prescreening should not exceed 30,000 minutes annually, considering that each individual gets prescreened in one minute. The program envisages a financial bonus of 25$ per hour so the maximum cost to be

Commented [SJH30]: good

Commented [SJH31]: not sure how this will work at all ..EHRs not equipped for project management data you will need a separate data system

Commented [SJH32]: why not health centers?

Commented [SJH33]: Timing is right but I get a bit nervous about adding performance rewards to implementation the issue is what happens when incentives go away .performance rewards are usually added to get a boost in performance-not to implement .

Commented [SJH34]: This could go into a section called –"on boarding" or some such most of it doesn't fit in data

Commented [SJH35]: This needs to be revisited .will need a stand alone data base (the EMRs can contain patient specific data) but need another to monitor implementation

Commented [SJH36]: What does this mean?

Commented [SJH37]: Helpful to have a budget justification that itemizes how much each item costs (rate per hour, etc.)

Commented [SJH38]: See my earlier comments about bonuses /incentives

incurred for this activity shall be 12,5000 $ per year questionnaire and risk profiling of the patient is expected to take five - ten minutes per patient and then entering the data into the EMR. As it is expected that a maximum of 30% of population i.e. program envisages a financial bonus of 50$ per hour so the total expenditure for this activity shall be 37,500$. The estimated "median cost of screenings in primary health care settings is 0.42 per patient screened while the estimated median cost of performing the brief intervention comes up to be dollars 3.43 $ per patient receiving the intervention in the Primary clinics" (Zarkin, 2003)
It is anticipated that out of all the screened patients, a maximum of 15% patients will require brief intervention, around 1,350. These individuals falling in the low to moderate risk category will require between 5-15 minutes of the physician's time which will become around 112.5 hours. Whereas 60%, 81 patients falling in moderate to high risk category will require between 15-60 minutes maximum per session (behavioral therapy) which will be around 20.25 hours from a certified behavioral therapist.

The physician will spend 112.5 hours extra for the entire SBIRT process, the project envisages a financial bonus of 100$ per hour for the physician and behavioral therapist. There are no data collection costs. The data will be stored in the EHR by a specialist from the training agency and will only be shared with the providers and staff members monthly to improve their performance.

The health care centers pay about 10,000$ a year to maintain and develop their electronic health records and also train staff to utilize the system (CMS.gov, 2015). In addition, a budget of 1000 $ is earmarked for miscellaneous petty expenditures for project related activities like public awareness posters or brochures etc. The maximum expense for this activity is estimated to be around 77,875$ per year (see appendix E)

see earlier comments-need to be much more detailed if going to retain

In order to successfully implement the SBIRT program it is imperative that the effective participation of the service providers is ensured. The staff and the providers working in the FQHCs are already overworked and the SBIRT program will demand extra effort both in terms of time and physical effort over and above their routine jobs. Therefore, unless the providers have some form of motivation it is possible that they might not give the program its due attention, which will be extremely detrimental to the outcome and sustainability of the program.

One of the mechanisms to ensure that the program is implemented in letter and spirit and ensure its effectiveness is to introduce financial incentives (Flodgren, 2011) for the providers and the staff participating in the program. The financial incentive shall be in the form of bonuses and the providers shall become eligible for getting the bonuses on achieving specified performance benchmarks. Providers who fail to achieve the monthly targets they will not be entitled for payment of bonus for that particular month. It is also imperative for the success of the program that the providers are not forced into the implementation of the program, therefore only those providers should be included who volunteer to participate in the program.

The incentive program will be offered to the individual providers, the distribution of the incentives to the individual participant shall be decided by the organization according to the role and time spent by each provider including physicians and staff participating in the program. Financial incentives will also be in the form of accreditation points (credit types) offered by the American Academy of Nurse Practitioners, American Credentialing Centers).

The financial bonuses will be granted on meeting the measures expected and specified for the implementation of the entire SBIRT process.

SBIRT program shall be funded from the grants received from the Federal Agencies, NY substance Abuse and mental Health Service Administration, SAMHSA and health insurance plans. Out of the six FQHCs, those who successfully achieve these benchmarks will become entitled to bonuses, which should be no less than 10% of their monthly emolument. The bonus program should continue during the implementation stage. After this, we hope that individual and organizational reputation will keep the providers and the staff motivated to follow all components of SBIRT.

Challenges

Challenges that can arise throughout SBIRT implementation include: competing priorities, privacy issues, sustainability, generating support, lack of funding, lack of knowledge, patients characteristic and background, provider attitudes and competences, patient languages, patient culture, patient resistance, patients' expectations and available staff to perform SBIRT (SAHMSA, 2013). In order to alleviate these challenges and make SBIRT implementation a success, several strategies will be used to mitigate them. For example, if a staff member becomes reluctant to change how things have been done traditionally and sees SBIRT as an extra burden, staff members will be reminded of the importance of SBIRT intervention in terms of cost effectiveness and the benefits. Other strategies include using of small rooms to conduct screenings and prescreening to mitigate patient privacy issues (Vimont, 2012). Looking out for ways to acquire new grants from other agencies to fund the program can aid in lack of funding (Gryczynski et al., 2011). Training can be done in-house with resources that are available and for free on the internet (Gryczynski et al., 2011). Some unintended consequences related to incentives on provider's performance might be that incentives may undermine the provider's motivation, causing them to focus on the incentive and not on the provision of services or the quality of the care provided. These and other unintended consequences that come along with a program implementation can create a burden for staff in time and added work related to data collection, training and other components of the implementation process. These unintended consequences and challenges can affect can affect costs, quality and patient health outcomes. However, using a collaborative approach will help mitigate them.

Commented [SJH39]: Ok but by whom?

Commented [SJH40]: ? SBIRT is reimbursable in NY State by Medicaid and Medicare

Evaluation

The SBIRT implementation program will be evaluated to assess for its success at various stages and is expected to serve as a feedback mechanism for the medical director and staff.

Commented [SJH41]: This describes what ---not how .assume a compilation of data, reports and feedback but need to describe process .

Process Evaluations (Exploration, Program Installation, Initial Implementation and Full Implementation), Economic and a system-wide evaluations will be conducted by the contracted agency for the first 12-month of the project, followed by evaluations from a trained researcher and evaluator at each center. The use of this external evaluator will aid to achieve impartiality for the very important first year of the implementation. These evaluations will be assembled into a comprehensive annual and final report that will help identify challenges, solutions, lessons learned and information about the impact of SBIRT on alcohol abuse outcomes from the development of the program. Cost-benefit and sustainability information will be achieved as a result of these assessments. Data for the report will be taken from the various measures involved in the implementation of the program at the six community health centers. Periodic, cyclical evaluations conducted at the 6 and 12-month marks will yield an estimate of the project team success. In addition, the SBIRT project team will be administered an exit survey that will be done at a twenty-four month period to assess for the success of the training given to providers and to collect their impressions of the program's success.

Commented [SJH42]: Good and more

Commented [SJH43]: What does this mean?

Commented [SJH44]: Nice

Summary

Screening, Brief Intervention, and Referral to Treatment (SBIRT) is a comprehensive and integrated approach to the delivery of early intervention and treatment services through universal screening for persons with substance use disorders and those at risk. Guided by the Fixsen's implementation framework, our implementation will consist of 4 core stages (exploration, program installation, initial implementation and full implementation) at the 6 FQHCs throughout New York State. Target settings and staff will be defined, as well as important measures and indicators of success. Program costs, incentives for participation and evaluation mechanisms will be defined as proposed in the plan. Following careful, cyclical review of data and performance will ensure positive implementation outcomes as well as patient population levels. Sustainability options and the learning process will continue beyond the implementation stages to ensure that protocols and specific mechanisms continue to fit with the FQHCs.

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Appendix A: Timeline for Implementation

Commented [SJH45]: Looks good but fix formatting (landscape better)

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year 2
EXPLORATION													
Hire external agency	▲												
Create workflow analysis	▲												
Conduct FQHC provider focus group	▲												
Design implementation plan		▲											
Off-site Training			▲										
INSTALLATION													
On-site training/simulation			▲										
Online SBIRT Course			▲										
Prep Urban and Rural Leaders				▲									
SBIRT Provider attitude survey					▲								
INITIAL IMPLEMENTATION													
Leader Tech Assistance					▲	▲	▲	▲	▲				
FULL IMPLEMENTATION													
First round of SBIRT with actual patients						▲							
*First set of patients referred to rehabilitation centers within one week						▲							
Check-in with							▲						

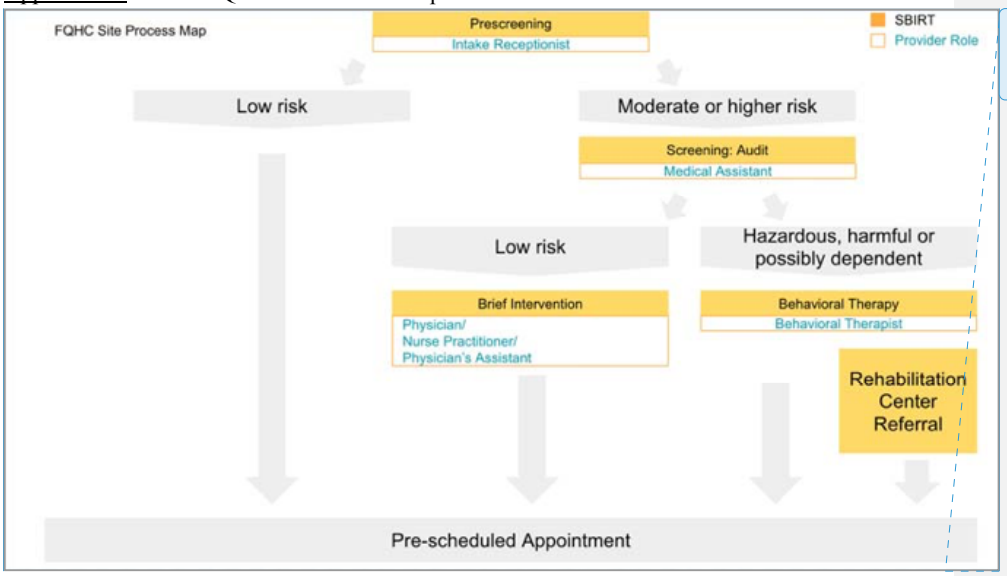
rehabilitation center 1 month after admittance													
[+]First set of patients receive behavioral therapy with behavioral therapist						▲							
Harmful, hazardous or possibly dependent patients 3 month phone call follow-up									▲				
[▯] First set of low-risk patients receive brief intervention with MD, NP, or PA						▲							
Low-risk patient phone call follow-up									▲				
Monthly metrics from FQHC sites (Intervention Collection Form)				▲	▲	▲	▲	▲	▲	▲	▲	▲	
Monthly EHR data uploads from FQHC sites				▲	▲	▲	▲	▲	▲	▲	▲	▲	
Evaluator Observations						▲						▲	▲
Sites receive implementation report												▲	
Virtual training and technical assistance													▲
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year 2

*Only in cases when a patient needs a referral to a rehabilitation center

[▯] Only in cases when patient needs Brief Intervention

[+]Only in cases when patient needs behavioral therapy

Appendix B: SBIRT FQHC Site Process Map



Commented [SJH46]: This is much improved but needs to allow patient with hazardous use to see primary care provider b4 behavioral health introduced .

Appendix C: SBIRT Intervention Measures

SBIRT Intervention Measures

Measure Title	Measure Description	Proposed Numerator	Propose Denominator	Target	Data
Prescreening	Percentage of adult patients prescreened in one month	Number of patients 18 y or older prescreened for alcohol use using the validated NIAAA prescreening question per month	Total number of patients seen per month	100% of total adult patients visiting the center per month	Data scored, collected and recorded by intake receptionist, per patient
Screening	Percentage of adult patients screened in one month	Number of patients 18 y or older screened using the AUDIT tool following a positive prescreen per month	Number of patients 18 y or older prescreened with NIAAA question per month	30% of prescreened patients	Data scored, collected and entered on patient's EMR by medical assistant
Brief Intervention	Percentage of adult patients receiving BI in one month	Number of patients 18 y or older receiving at least (1) Brief Intervention session following a hazardous drinking result in the AUDIT questionnaire per month	Number of patients 18 y or older screened with AUDIT tool per month	15% of screened patients	Data collected and entered on patients EMR by physician/NP/ PA
Brief Therapy	Percentage of adult patients receiving BT in one month	Number of patients 18 y or older receiving at least 1 (one) brief therapy session following a hazardous drinking result in the AUDIT questionnaire per month	Number of patients 18 y or older eligible fro as per AUDIT tool per month	40% of patients eligible for BI	Data collected and entered on patients EMR by Behavioral Therapist

Appendix D: SBIRT Intervention Data Collection Form

Please ensure that information reported is only for the reporting month and submitted monthly

1. Did your community center collect the following information for all individuals screened for alcohol use?

- Date and location of where screening occurred
- Staff responsible for conducting the screen and providing the brief intervention and/or brief therapy (as applicable)

FQHC Name	
Reporting Month/Year	

Measure Number	
Total Number of Clients Seen this Month	
Number of Clients Screened this Month Using the AUDIT tool	
Number of Clients Scoring "Positive" for a Brief Intervention	
Number of Clients Receiving at Least One (1) Brief Intervention Session	
Number of Clients Receiving at Least One (1) Brief Therapy session	
Number of Clients Referred to Specialty Services	

Appendix E: COST MATRIX For the Six FQHCS

Activity	% of patients	No of patients	Time per session (minutes)	Total Sessions	Total Minutes	Hours	Bonus per hour $	Maximum Cost per year $
Training				4				3,000
Printing								600
Misc. Exp.								1,000
Pre screening	100%	30,000	1	1	30,000	500	25	12,500
screening	30%	9,000	5	1	45,000	750	50	37,500
Brief Intervention	15% of screened pts	1,350	5	1	6,750	112.5	100	11,250

Brief Therapy	out of the 15% of the screened pts, 40 % will be eligible for brief therapy	81	15		1,215	20.25	100	2,025
EHR								10,000
TOTAL COST PER YEAR								77,875

Appendix F: Audit Screening Tool and Scores



Alcohol Use Disorders Identification Test (AUDIT)[a]

Alcohol consumption:

1. How often do you have a drink containing alcohol?
2. How many drinks containing alcohol do you have on a typical day when you are drinking?
3. How often do you have 6 or more drinks on 1 occasion?

Drinking behavior:

4. How often during the past year have you found that you were not able to stop drinking once you had started?
5. How often during the past year have you failed to do what was normally expected of you because of drinking?
6. How often during the past year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

Adverse reactions:

7. How often during the past year have you had a feeling of guilt or remorse after drinking?
8. How often during the past year have you been unable to remember what happened the night before because you had been drinking?

Alcohol-related problems:

9. Have you or has someone else been injured as a result of your drinking?
10. Has a relative, friend, or a doctor or other healthcare worker been concerned about your drinking or suggested you cut down?

The AUDIT is scored on a scale of 0 to 40, with a score of 8 or higher considered positive and warranting further assessment. Details on scoring can be accessed at http://whqlibdoc.who.int/hq/2001/WHO_MSD_MSB_01.6a.pdf.



Inadequate (0 point)	Marginal (half of possible points)	Excellent (all possible points)	Points Possible	Points Earned	Comment & Feedback
Document is not well crafted. Has multiple typographical errors, gramatical errors, inconsistent verb usage, lacks organization.	Document is readble but has issues with organization, typograpical and gramatical errors, organization is not strong.	Document reads like a professional proposal. Free of typoss and gramatical errors, well organized.	30	28	
Content does not pull from the literature. It does not align with what we know about the process of measures or measurements. Does not use appropriate references.	The content includes basic measurement concepts but errors or key ommisions remain. Marginal use of references.	Measurement and other literature is comprehensive and accurately reflected. References are well utilized.	10	10	
Measures are problematic: either not feasible or are contradictory. Do not align with project intent.	Measures somewhat align with project intent. Measures are feasible but lask specificity and sensitivity.	Measures are strongly connected to intent. Clear, precise and have high degree of sensitivity and specificity.	10	9	
Project is not sustainable-too many moving pieces or too costly	Project may be sustainable but will take considerable attention or resources (worforce, data, costs)	Project is fluid and easily sustainable with minimal resources.	10	10	
Project is not consistent with professional standards	Project lacks professional polish/formatting	Project has a professional grade/quality.	15	15	
Not APA or missing references or muliple errors.	APA references but errors	Reference section is professional and thorough	10	9	

			115	104	
		TOTAL	**200**	**185**	

[redacted]

95

HNSC 7930X

Term Paper

Section I

Concussion Under-Reporting and Pressure from Coaches, Teammates, Fans, and Parents

Kroshus et al. (2015)

1. The study's dependent variable is concussion reporting. It is clear that the research is about this phenomenon. Ongoing efforts to reduce the public health burden of concussions from sports span multiple levels, ranging from attempting to modify individual safety behaviors to changing the rules of sports to reduce exposure to potentially injurious head impacts.

2. There isn't too much evidence presented to substantiate the occurrence of this phenomenon. In the introduction, it is stated that more than eight million adolescents and young adults participate in competitive sports at the high school or collegiate level in the United States on an annual basis. However, no exact statistics were presented on how many of these athletes have reported concussions due to participating in competitive sports. It is stated that concussions due to contact with another athlete, equipment, or the playing surface are being increasing recognized as a frequent injury in many sports.

3. There is plenty of substantiation on why concussion reporting is important. It is stated that concussions are mild traumatic brain injuries. Although symptoms of most concussions resolve in less than two weeks, during this time period the somatic, cognitive, and emotional symptoms sustained can interfere substantially with an athlete's activities of daily living, and can pose a

significant health burden. In some cases, the neurologic consequences can extend across the lifetime.

4. The study's independent variable is the athlete's environmental pressure. This study focuses on one particular dimension of environment-athlete interaction: the pressure athletes experience from individuals in their sports environment to continue playing with symptoms after a possible concussion.

5. The study mentions that the Theory of Planned Behavior (TPB) may help explain between-individual variability in concussion reporting. Concussion reporting intention is associated with reporting behavior, and expectancy value cognitions such as perceived norms and attitudes have been found to be associated with reporting behavior. However, a lot of the variability in both intention and reporting behavior is still left unexplained by the TPB model. It is believed that TPB ignores the important role of context. It has been proposed that using an expanded model in which environment interacts with reporting intentions to influence symptom reporting would be beneficial. Building on this model, Bandura's Social Cognitive Theory (SCT) provides a more inclusive framework for explaining the athlete's experience making concussion reporting decisions in consideration of contextual influences. SCT outlines a triadic reciprocal relationship between individual-level psychological determinants of behavior, environmental factors, and behavior. Based on this information, the theoretical framework is clearly elaborated, applies to the dependent variable under investigation, and provides plausible assumptions.

6. There is plenty of empirical justification for the selection of this independent variable. Previous studies have found that a coach's response to concussion reporting influences future reporting behavior of high school athletes. Also, when individuals experience a gap between their behaviors and how they believe the referent group would behave, they can experience an

internal pressure to modify their behaviors or beliefs out of desire for social approval. Prior research has found a significant association between perceived teammate or athlete norms about concussion reporting and concussion reporting intentions or behaviors. Pressure to comply with the explicit or implied demands of a social group are heightened when the source of the pressure controls access to valued commodities, such as rewards or incentives from coaches or parents, which can be playing time, scholarships, tuition money, and affection. Spectators or team supporters also influence the pressure an athlete feels to continue playing while injured.

7. Prior research on concussion reporting has often used TPB as their theoretical framework. The authors of this study decided to use SCT, which builds off the model of TPB. Doing so allows the authors to apply the theoretical framework in a different way that will enhance knowledge.

8. The study tested the hypotheses that male and female US collegiate athletes who experience greater pressures from teammates and coaches, and to a lesser extent from parents and fans, to continue playing after a head impact will be less likely to intend to report a suspected future concussion. Therefore, the authors seem to be specifying a more complex causal theory using a moderator model. An athlete's environment causes concussion underreporting only when they experience pressure. No potentially confounding variables are measured, controlled, or ruled out by the authors.

9. The study's unit of analysis is the individual.

10. From the introduction, I do feel that I get a clear sense of the mental picture guiding this research. It is clear that the article will be concentrating on concussion reporting amongst collegiate athletes using the SCT model to see how the environment, specifically the pressure

athletes experience from individuals in their sports environment to continue playing with symptoms after a possible concussion, affects future concussion reporting.

11. The study's research case was the individual, making it an appropriate empirical reflection of the study's unit of analysis. The conceptual model did not articulate a multilevel research question or suggest cross socio-temporal comparisons.

12. The study's sample size was 328. There was no indication that the authors conducted a power analysis to determine the appropriate sample size. Being that the sample size is over 50, it does not seem small. I believe a sample size of 328 is large enough that the study's findings will not be inconclusive or have any type II errors.

13. Purposive sampling was used for sample selection of athlete participants. The population consisted of athletes from four northeast colleges that were not members of the Power 5 athletic conferences. The institutional response rate was 25%, with eight of the twelve schools contacted not responding or declining participation. Of the four schools, 19 of 35 eligible contact and collision team coaches (54%) allowed their team members to have the choice to participate in the study. On participating teams, the individual participation rate was 74%. There were six soccer teams, three lacrosse teams, three basketball teams, two field hockey teams, one softball team, and one volleyball team included in the study. The appropriate method was used to address the central research question, and the issue of comparability was mentioned. The inclusion of lower profile collegiate sports teams was a decision made purposively to explore the experience of collegiate athletes who are at risk of concussion, but whose injuries receive relatively less public attention. However, it is stated that it is not clear the extent to which the present findings compare to the experiences of football and hockey players, particularly those at higher levels of competition.

14. Concussion reporting was not explicitly defined. The authors do not discuss the possible strengths and weaknesses, or provide any rationale or justification for their definition. However, one can infer the definition of concussion reporting to be the act of reporting a possible concussion, based on known symptoms, to a family member, friend, coach, or doctor. I would say this is a good definition of concussion reporting as it seems quite self-explanatory to me.

15. Concussion reporting was measured using a written survey. However, concussion reporting intention was only one question on the survey. Intention to report symptoms of a suspected concussion was measured with an item reading: "I intend to report any symptoms I experience after a head impact if I think these symptoms are from a concussion." The question was scored on a seven-point Likert scale, with response options ranging from 1=strongly disagree to 7=strongly agree. Thus, this operationalization was clearly stated, however, the authors do not discuss the possible strengths and weaknesses, or provide any rationale or justification for it. I think this operationalization could have been done better by asking more than one general question about concussion reporting.

16. The only evidence of validity mentioned in the study was that validated measurement instruments were used where available, and where unavailable, items were developed for the purpose of the study. However, it is unclear if a validated instrument was used to measure concussion reporting intention. There was no mention of reliability measurements in the article.

17. The independent variable of environmental pressure is conceptualized as the pressure that athletes feel during injury recovery, which is described as a product of social and competitive pressures. A key concept is that pressure is an internal experience, in response to external demands. The authors do not discuss the possible strengths and weaknesses, or provide any rationale or justification for their definition. I feel that this is a well described definition.

18. Pressure to continue play after a head impact was measured through a written survey. Participants were instructed to think about the previous athletic season and indicate their strength of agreement with four statements reading: "I have felt pressure from (source) to return to play after a head impact." Pressure from four sources were given: teammates, coaches, parent/guardian, and fans. Responses to each item were scored on a seven point Likert scale, ranging from 1=strongly disagree to 7=strongly agree. The wording "head impact" rather than "concussion" was used to limit variability in responses attributable to differences in the athlete's ability to recognize which head impacts did or did not result in a concussion. Thus, this operationalization was clearly stated, however, the authors do not discuss the possible strengths and weaknesses, or provide any rationale or justification for it. I think this operationalization was done rather well because it got straight to the point.

19. Again, the only evidence of validity mentioned in the study was that validated measurement instruments were used where available, and where unavailable items were developed for the purpose of the study. However, it is unclear if a validated instrument was used to measure environmental pressure. There was no mention of reliability measurements in the article.

20. New data about participants' assessment of concussion knowledge, subjective pressure experiences, and intentions related to future concussion reporting was collected. Two key limitations about the data were discussed. Although there were no significant differences between participating and non-participating institutions in publically available characteristics, it is possible that there were differences in terms of institutional support for concussion safety, thus results are not generalizable to all institutions. Additionally, generalizability may be limited by the sport and level of competition of the teams included in the sample. I cannot think of any other limitations other than the use of a cross-sectional design, which is mentioned below.

22. This study used a cross-sectional design. There was no rational given for this decision. Longitudinal data, with reporting intention assessed at pre-season and recall of in-season pressure and reporting behavior, would allow for analyses of the extent to which pre-season reporting intention modifies the association between pressure and reporting behavior. Therefore, a longitudinal study may have been better fitting than a cross-sectional since cross-sectional limits the ability to confidently make causal inferences about the association between pressure and reporting behavior.

23. This study employed an observational design. There was no mention of confounders throughout the entire article, so one cannot be sure if any were identified and adjusted for in the analysis.

Section II

Understanding Concussion Reporting Behavior Using a Model Based on the Theory of Planned Behavior

Kroshus et al. (2013)

1. The study's dependent variable is concussion reporting. It is clear that the research study is about this phenomenon. Concussion underreporting is a problem that has been identified in multiple populations of youth and adolescent athletes. An athlete's report of concussion symptoms to coaches or medical personnel is an important component of concussion risk reduction.

2. There is evidence to substantiate the occurrence of this phenomenon. In a nationally representative sample of male and female high school athletes across 20 sports, 2.5 diagnosed

concussions were found to occur per 10,000 athlete exposures to a game or practice; the highest rates were observed in boys football, ice hockey, and lacrosse, and girls soccer, lacrosse, and basketball. I would assume that in order for these concussions to be diagnosed they must have been reported.

3. There is plenty evidence to substantiate the importance of this phenomenon. Participation in high school and collegiate sport in the United States is at an all-time high, with estimates suggesting that on an annual basis more than 7.6 million high school students and 450,000 collegians compete in organized sport. Although the benefits of participation in sport for adolescents are well established, there is a growing concern about the prevalence and consequences of sport-related concussions. Accumulating research about the short- and long-term neurologic and functional consequences of concussions and sub-concussive repetitive head trauma in sports makes it clear that a public health priority should be to reduce its burden.

4. The study's independent variable is intention to perform the concussion reporting behavior. Intention is said to be predicted by three factors: attitudes, subjective norms, and perceived behavioral control.

5. In the study it is stated that public health literature suggests that drawing upon existing psychosocial theories of health behavior to understand mechanisms underlying concussion reporting would be beneficial. The Theory of Planned Behavior (TPB) is a robust expectancy value theory that has been tested in a variety of contexts involving rational decision making. According to the theory, the most important predictor of a behavior is the intention to perform that behavior. Effectively intervening to increase symptom reporting first requires understanding the psychosocial mechanisms through which this reporting is facilitated or restrained. Based on this information, the theoretical framework is not elaborated as clearly as it should have been,

but it seems that it applies to the dependent variable under investigation, and provides plausible assumptions.

6. There is little empirical evidence for the selection of the independent variable other than stating that recent focus groups with high school athletes suggest that factors other than the lack of awareness and symptom knowledge, such as not wanting to stop playing, not wanting to look weak, and not wanting to let teammates down, may explain why athletes do not report symptoms of concussions.

7. It is not stated directly if the authors applied the theoretical framework in a different or creative way that will enhance knowledge. All that was stated is that to date there has been limited explicit application of behavior change theory to the field of sports injury prevention. However, there have been recent suggestions that TPB may be an appropriate frame for an understanding of concussion reporting behavior.

8. In a population of late adolescent and young adult male ice hockey players, the primary aim of the study was to empirically assess the fit of a model based on the constructs of TPB for explaining concussion reporting behavior. Therefore, the authors seem to be specifying a more complex causal theory using a moderator model. An athlete's intention to report concussions affects concussion reporting only when certain attitudes or subjective norms are in place. No potentially confounding variables are measured, controlled, or ruled out by the authors.

9. The study's implied unit of analysis is the individual.

10. Overall, I feel like I get a somewhat clear sense of the mental picture guiding this research from the introduction section. It seems that the authors are using TPB to see how intention to

report concussions affects concussion reporting behavior in adolescent and young adult male ice hockey players when certain attitudes and subjective norms are in place.

11. The study's research case was the individual, making it an appropriate empirical reflection of the study's unit of analysis. The conceptual model did not articulate a multilevel research question or suggest cross socio-temporal comparisons.

12. The study's sample size was 256. There was no indication that the authors conducted a power analysis to determine the appropriate sample size. Being that the sample size is over 50, it does not seem small. I believe a sample size of 256 is large enough that the study findings will not be inconclusive or have any type II errors.

13. Purposive sampling was used for sample selection of athlete participants. Study participants were 18-21 year old male hockey players who were competing in an American Tier III Junior A hockey league. Recruitment occurred first at the team level; 12 of 14 league coaches (86%) agreed to give team members the opportunity to voluntarily participate in study activities. Research staff visited each of these 12 teams and obtained informed consent from 97% of players in this age category. The appropriate method was used to address the central research question, and the issue of comparability was discussed. It is stated that the result may not be comparable to populations of athletes in other sports, at different levels of competition, and of the female gender.

14. Concussion reporting was not explicitly defined. The authors do not discuss the possible strengths and weaknesses, or provide any rationale or justification for their definition. However, one can infer the definition of concussion reporting to be the act of reporting a possible

concussion, based on known symptoms, to a family member, friend, coach, or doctor. I would say this is a good definition of concussion reporting as it seems quite self-explanatory to me.

15. Concussion reporting was measured using a written survey. Participants were asked whether during the current season they had experienced any of the symptoms mentioned in a previous question after an impact and did not immediately tell a coach or athletic trainer. The item was scored 0 or 1, with 1 indicating non-report. Thus, this operationalization was clearly stated, however, the authors do not discuss the possible strengths and weaknesses, or provide any rationale or justification for it. I think this operationalization could have been done better by asking more than one general question about concussion reporting.

16. The only evidence of validity mentioned in the study was that validated measurement instruments were used where available, and where unavailable, new items were developed based on relevant literature reviews with and pilot qualitative interviews conducted with late adolescent and young adult male hockey players. However, it is unclear if a validated instrument was used to measure concussion reporting. There was no mention of a reliability measurement for concussion reporting behavior.

17. Intention is conceptualized as being directly predicted by three factors: attitudes, subjective norms, and perceived behavioral control. As such, intention mediates the association among these factors and the performance of the behavior. Attitude reflects the individual's evaluation of the consequences of performing the behavior. Subjective norms reflect perceived pressure to perform the behavior from people whose opinions and behaviors are considered important to the individual in question. Perceived behavioral control reflects an individual's evaluation of the ability to perform the behavior. The authors do not discuss the possible strengths and

weaknesses, or provide any rationale or justification for their definition. I feel that this is a sound definition.

18. Intention was measured using a written survey. On the survey, participants were provided with a list of eight common symptoms of concussions and were asked whether they intended to immediately report the presence of each symptom to their coach or athletic trainer if the concussion were sustained after an impact. All items were similarly scored on a 7-point scale. In terms of attitude about outcomes of concussion reporting, participants reported how strongly they agreed or disagreed with eight statements about possible positive and negative outcomes of concussion reporting. Items were scored on a 7-point scale, with higher summed scores representing the belief that there are more negative consequences of a reporting a concussion. In terms of subjective norms, participants reported how strongly they agreed with seven statements about what a hypothetical athlete or one of their teammates would do in various reporting situations. Items were drawn from Rosenbaum and Arnett's Concussion Attitude Inventory, with modifications so that each item separately referred to athlete and teammate norms. The 14 items were scored from one to seven, and the sum of individual items was computed, with higher scores representing more negative normative beliefs about concussion reporting. In terms of self-efficacy, which is considered to be a component of an individual's perceived behavior control, participants reported confidence in their ability to report symptoms of a concussion under various challenging conditions with a five-item measure. Items were scored on a 7-point scale, with responses ranging from "strongly disagree" to "strongly agree." The sum of item scores was computed, with a higher score representing greater reporting self-efficacy. Thus, this operationalization was clearly stated, however, the authors do not discuss the possible strengths

and weaknesses, or provide any rationale or justification for it. I think this operationalization was done rather well because it seems very thorough.

19. The only evidence of validity mentioned in the study was that validated measurement instruments were used where available, and where unavailable, new items were developed based on relevant literature reviews with and pilot qualitative interviews conducted with late adolescent and young adult male hockey players. However, it is unclear if a validated instrument was used to measure intention. There is use of reliability measurements for intention to report concussion symptoms, attitudes about outcomes of concussion reporting, subjective reporting norms, and self-efficacy. A Cronbach alpha score of .89 shows strong internal consistency of the measure for intention to report concussion symptoms. A Cronbach alpha score of .62 shows that the internal consistency of the measure of attitudes about outcomes of concussion reporting was low, suggesting that this set of perceived consequences may not strongly reflect a single latent construct. A Cronbach alpha score of .74 shows that the internal consistency scale of subjective reporting norms was adequate. Finally, a Cronbach alpha score of .91 shows that scale internal consistency was high for self-efficacy.

20. New data were collected on the reporting behavior, intention, perceived norms, self-efficacy, perceived outcomes of reporting, and concussion knowledge of participants. A few limitations of the study were discussed. Limitations of the analysis included its generalizability to populations of athletes in other sports, at different levels of competition, and of the female gender. Attitude, norms, and self-efficacy measures were developed with particular reference to late adolescent and young adult male hockey players based on pilot qualitative interviews with this population, so their utility for analyses in other populations would need to be evaluated before future use. Additional limitations include the cross-sectional nature of the study, as well as the use of self-

report retrospective measures for behavior, symptoms, and diagnosed concussions sustained. Although intention has been shown to be a strong predictor behavior across a range of domains, use of this measure constrains the ability to make causal inferences. I cannot think of any other limitations.

22. The study used a cross-sectional design. There was no explanation given for this decision. It would be beneficial if future longitudinal research was done to test the prospective usefulness of TPB in predicating concussion reporting behavior, including the strength of the association between behavioral intention and future behavior.

23. This study employed an observational design. There was no mention of confounders throughout the entire article, so one cannot be sure if any were identified and adjusted for in the analysis.

Section III

Common Strengths

One of the main reasons someone may read a research article is because he/she finds the topic interesting and important. The importance of concussion reporting was prominent in both articles. This is vital because if the importance of the dependent variable is not stressed in the introduction, a reader may stop reading and move on to another article. Both articles mentioned the importance of concussion reporting right away and very thoroughly, which I find to be a great strength. Both studies also provided theoretical justification for their independent variables. It is interesting to note that both articles mentioned TPB. While the 2013 Kroshus et al. article used TPB as its main focus, the 2015 Kroshus et al. article used SCT, which built off of TPB.

Overall, these are the most prominent common strengths found in the introduction sections of the articles.

It is vital that the research case is an appropriate empirical reflection of the study's unit of analysis. One common strength found in the methods section of both articles is that each had research cases on the individual level, which was same level as the unit of analysis. Knowing how a variable is being operationalized is also very important for readers. Both articles did an excellent job of explaining how their dependent and independent variables were measured. All scales used were mentioned and explained clearly for the questions included on the written surveys in each article. Overall, these are the most important common strengths found in the method sections of these articles.

Common Weaknesses

One weakness I noticed right away was neither article conceptualized concussion reporting. Even if it seems rather self-explanatory, a research article should define its dependent variable clearly. It was also unclear what the nature of the relationship the authors expected to uncover between their variables was: whether the articles were aiming for causal identification or casual explanation. It was difficult for me to decide if the authors were using a rudimentary or a more complex causal theory because they seemed to jump back and forth between the two in both articles. Another major flaw was that neither article spoke about any potentially confounding variables that should have been measured, controlled for, or ruled out. Being that both studies employed an observational design, the authors needed to be aware of the possibility of confounders and control for them in their analyses. Failing to adjust for confounders can critically impact the results of their studies.

The last common weakness I found was that both studies employed a cross-sectional design. A cross-sectional study provides a snapshot view of a phenomenon as it exists at only one point in time. In a cross-sectional design, data is collected on subjects only once, and measures them simultaneously on the independent and dependent variables. While this design has its advantages, such as a lower cost, quick answers, and no worry about loss to follow up, the disadvantages seem more crucial. In addition to being susceptible to reverse causality, a cross-sectional design has limited internal validity, so the most that can be concluded is correlation not causality. Overall, I would say that using this type of study design is a weakness for both studies.

Section IV

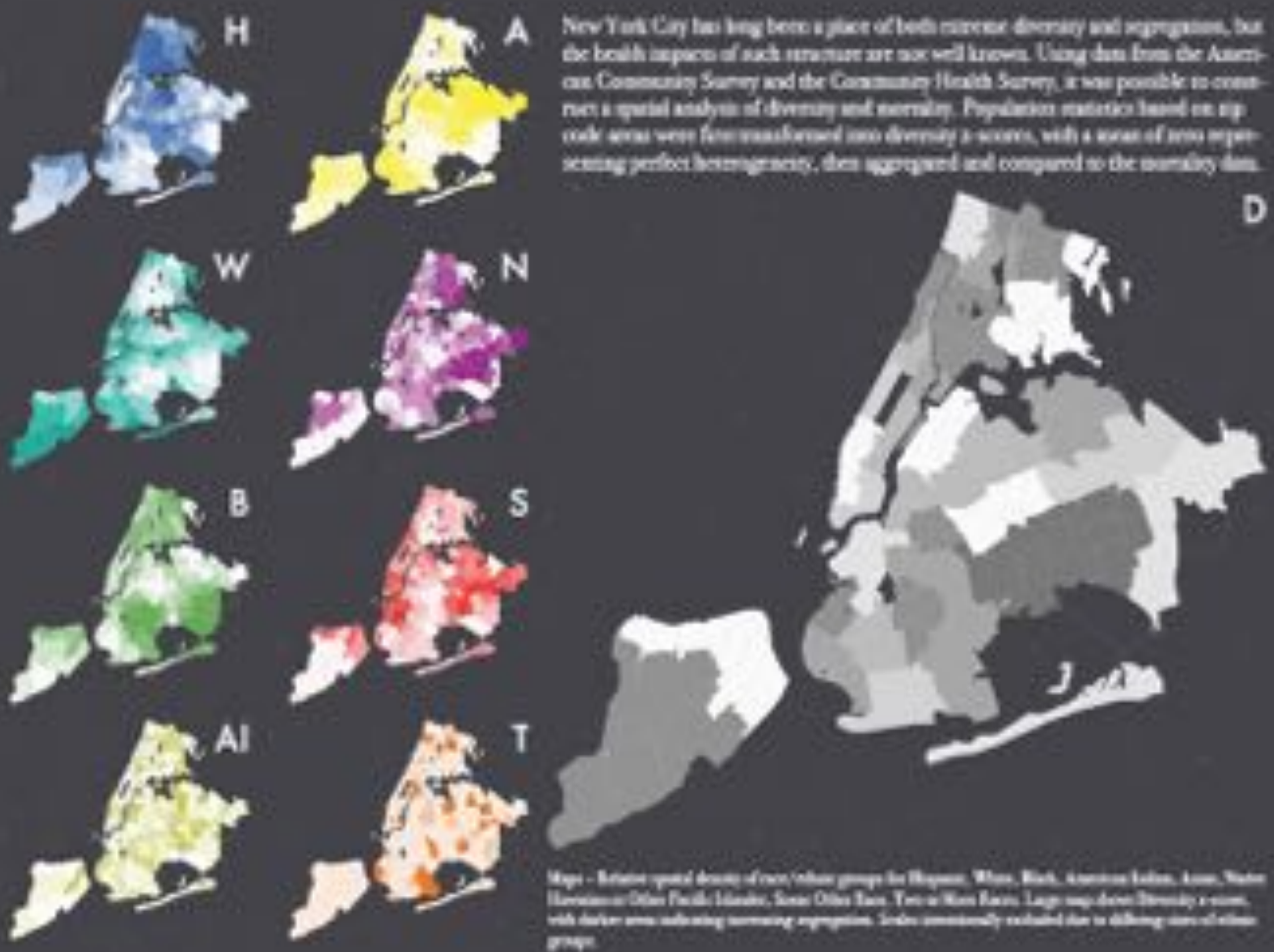
There are a few recommendations I would make for future researchers to do differently when studying concussion reporting. My first recommendation would be to generate a large sample size or conduct a power analysis to determine exactly how many participants are needed. While neither of these studies had a small sample size by any means, having a sample size of 2,000 would be better than 200. This larger sample size would reduce the chance that the study findings might be inconclusive and that any non-significant results may be a Type II error. I would also recommend conceptualizing the dependent variable, or concussion reporting, more prominently in future studies. While concussion reporting may seem rather self-explanatory to some, it is important that is explicitly stated in the paper. It is also important to present evidence of both reliability and validity for definitions and measurements of independent and dependent variables. If a measure is not reliable it cannot be valid. Reliability is relatively easy to assess in comparison to validity, and it is usually assessed first. Future studies should not stop after

providing evidence of reliability because a measure can be reliable, but not valid. Therefore, evidence of validity is also necessary.

While all the recommendations given above are important, my two biggest recommendations are to use a longitudinal research design rather than a cross-sectional one, and identify and adjust for potential confounders. Confounders distort the true relationship between the independent and dependent variables, making them very problematic. It is important to identify potential confounders and remove their distorting effects so the true relationship between variables is known. Controlling for confounding in an observational study can be done using multiple linear regression and multiple logistic regression. A longitudinal design should also be used over a cross-sectional design when able. Longitudinal studies rule out reverse causality because the design establishes that the independent variable preceded the dependent variable. They also allow for the inference that the independent and dependent variable are likely to be causally related, not just correlated. All the recommendations listed above would enhance the quality of the research and the strength of its causal conclusions in regards to concussion reporting.

Does Diversity Matter?

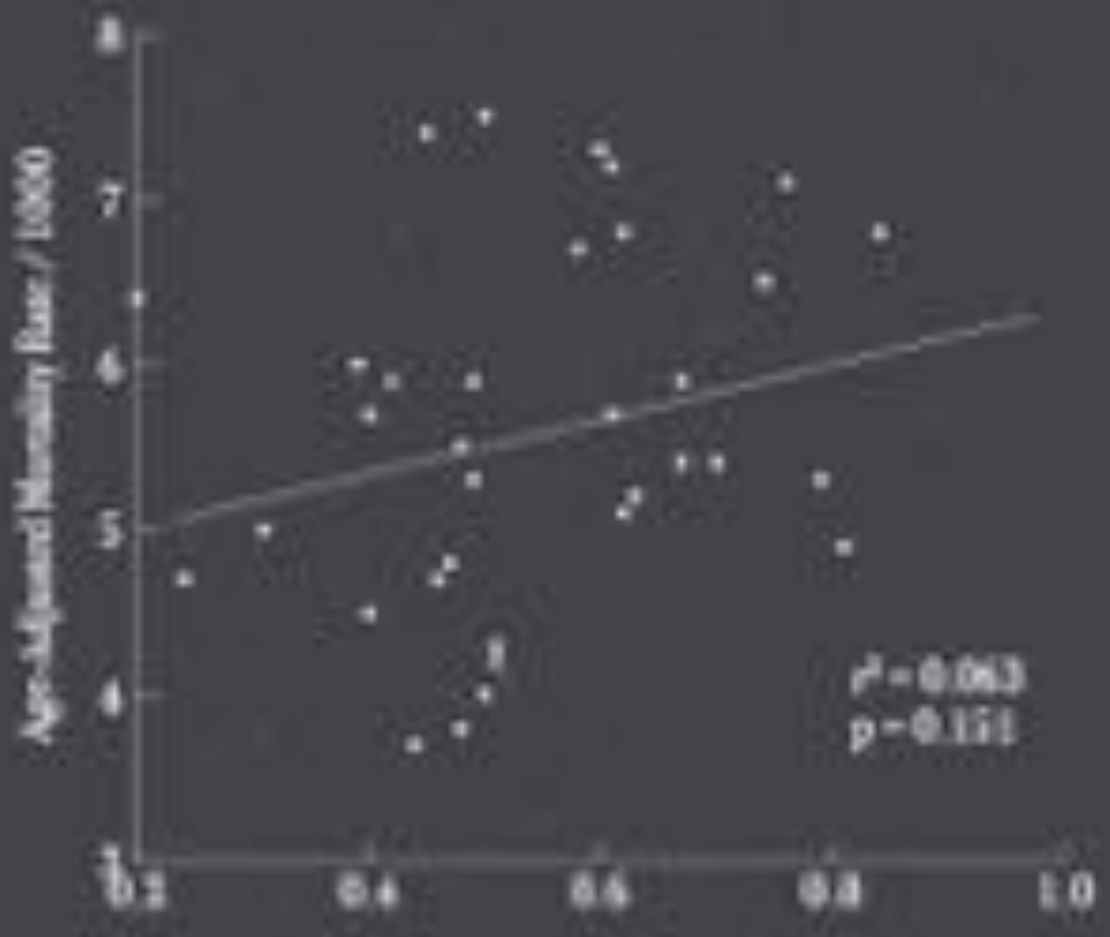
[redacted]



New York City has long been a place of both extreme diversity and segregation, but the health impacts of such structure are not well known. Using data from the American Community Survey and the Community Health Survey, it was possible to construct a spatial analysis of diversity and mortality. Population statistics based on zip code areas were first transformed into diversity z-scores, with a score of zero representing perfect heterogeneity, then aggregated and compared to the mortality data.

Maps – Relative spatial density of race/ethnic groups for Hispanic, White, Black, American Indian, Asian, Native Hawaiian or Other Pacific Islander, Some Other Race, Two or More Races. Large map shows diversity z-scores, with darker areas indicating increasing segregation. Grates intentionally excluded due to differing sizes of ethnic groups.

Mortality vs Diversity



Graph – Plot of mortality vs diversity for 34 United Hospital Fund Neighborhoods

Other Correlations

Variable	Correlation	Significance
servings of vegetables in the last 24 hours	-0.500	0.004
daily sugar sweetened beverage consumption	0.428	0.015
self reported BMI	0.426	0.015
household income	-0.352	0.048
age-adjusted mortality rate / 1000	0.305	0.090
proportion that have ever been tested for hepatitis C	0.384	0.115
proportion of age 16+ in labor force	-0.382	0.118
proportion unable to get needed medical care in past year	0.076	0.681
proportion that have seen personal care doctor in the past year	0.066	0.718

Table – Select correlations between diversity and variables examined from CHS and ACS data.

References

U.S. Census Bureau; American Community Survey, 2013 American Community Survey 5-Year Estimates, Table DP03.

U.S. Census Bureau; American Community Survey, 2013 American Community Survey 5-Year Estimates, Table DP05.

New York City Department of Health and Mental Hygiene. Epiquery: NYC Interactive Health Data System - Death/Mortality Data 2013.

New York City Department of Health and Mental Hygiene. Epiquery: NYC Interactive Health Data System - Community Health Survey 2013.

Presenter: [redacted] Instructor: Lei

Item	Max score	Score	Comments
Introduction provides motivation and background for the project	5	5	ACS data
Descriptive statistics include a table and provide a clear overview of the dataset	5	5	
Methods corresponding to the Results section are correctly described.	5	5	I was confused about 2-5 one diversity measure
Statistical methods are appropriate for the type of data and the research question	5	5	
Results include figures or tables for key results. Figures and tables are easily interpretable.	5	5	Great use of cross variables
Graphs and tables are labeled, have succinct and descriptive titles and captions	5	5	
Results of any hypothesis tests are succinctly stated, confidence intervals given if appropriate.	5	5	
Thoughtful Summary provided, not just repeating the results	5	5	
Poster is organized and easy to follow (sections are complete but include only relevant information only, are clearly marked)	10	10	
TOTAL	50	50	GREAT poster

Presenter: [redacted] Instructor: TDV

Item	Max score	Score	Comments
Introduction provides motivation and background for the project	5	4 1/2	NEIGHBORHOOD DIVERSITY
Descriptive statistics include a table and provide a clear overview of the dataset	5	5	
Methods corresponding to the Results section are correctly described.	5	5	
Statistical methods are appropriate for the type of data and the research question	5	5	
Results include figures or tables for key results. Figures and tables are easily interpretable.	5	5	
Graphs and tables are labeled, have succinct and descriptive titles and captions	5	5	IMPRESSIVE USE of GIS & GRAPHING SOFTWARE
Results of any hypothesis tests are succinctly stated, confidence intervals given if appropriate.	5	5	
Thoughtful Summary provided, not just repeating the results	5	4 3/4	
Poster is organized and easy to follow (sections are complete but include only relevant information only, are clearly marked)	10	9 3/4	
TOTAL	50	49	

Appropriate targeting of hepatitis C testing in NYC: An evaluation using the Community Health Survey, 2013

[redacted]

Introduction

- Groups most at risk are those born between 1945-1965, Hispanics, and lower SES.
- >80% of HCV cases are curable, but only 5-6% of cases receive treatment
- Half of infected individuals are not diagnosed
- 1945-1965 birth cohort targeted for testing by CDC
- **Objective:** Assess whether appropriately targeted testing is being conducted in NYC according to racial and socioeconomic disparities and 1945-1965 birth cohort.

Methods

NYC Community Health Survey 2013

- Annual cross-sectional survey of non-institutionalized adults 18 and over in NYC
- Stratified random sample, stratified by 42 UHF neighborhoods in NYC
- 125 questions on multiple demographic and health topics, including HCV testing:

Statistical Analyses

- Response variable of interest: Have you ever had a Hepatitis C test? (Yes / No)
- Hypothesized predictors:

Race / ethnicity	Insurance status
Language spoken at home	Access to care
	Neighborhood poverty %
Household income	In 1946-65 birth cohort

- Chi-square and logistic regression were used to test for significant associations.
- Analyses conducted in R, accounted for survey design

Rationale:

- Response and predictor variables are categorical, data is cross sectional

Results

Table 1: Sample Characteristics & HCV testing rates

		n	% of Sample	% Hep C Test Ever
Race / Ethnicity	White	2977	35.5%	34.8%
	Black	1975	22.0%	54.7%
	Hispanic	2558	26.9%	39.8%
	Asian/PI	1008	13.5%	38.4%
	Other Non-Hispanic	180	2.1%	56.6%
1945-1965 Birth Cohort	Yes	3206	31.7%	36.0%
	No	5253	68.3%	44.8%
Neighborhood Poverty	<10% (low)	1837	21.1%	37.5%
	10 -<20%	2699	36.1%	40.5%
	20 -<30%	2095	24.6%	42.2%
	30 -<100% (very hi)	1827	18.1%	48.1%
Didn't Get Needed Health Care (last 12 mo.)	Yes	954	11.3%	46.9%
	No	7698	88.7%	41.1%

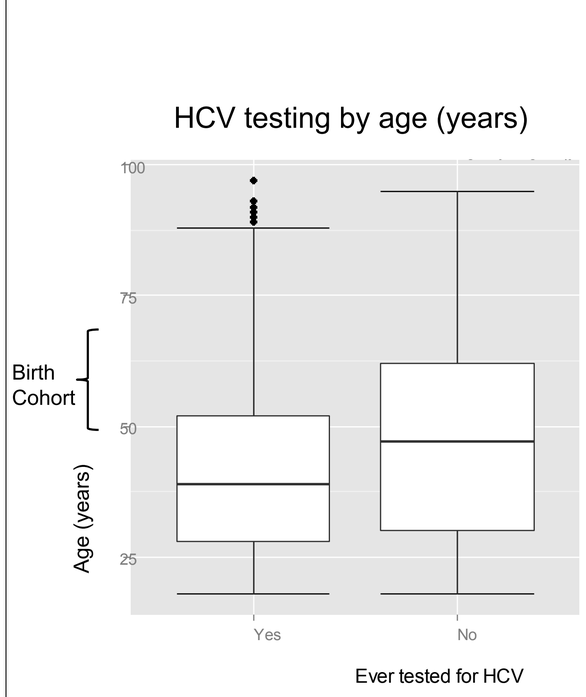


Figure 2: Individuals who report having been tested for HCV are 7.6 years younger on average (p <0.001).

Results *(cont'd)*

- n = 7452 individuals responding data on HCV testing (86.7%).
- 41.69% report having ever had an HCV test
- Significant predictors:
  - Black, Hispanic, or other non-Hispanic race,
  - Medicaid or uninsured,
  - Neighborhood poverty >30%,
  - Not receiving needed care in the last 12 months
  - Speaking English at home.
- Individuals born between 1945 and 1965 were significantly **less** likely to have received a test (OR 0.69, 95% CI 0.61,.079).
- No significant interaction was found between race/ethnicity and cohort status.

Table 2: Univariate regression models showed these characteristics significantly predicting ever having had an HCV test.

	OR	95% CI	p-value
Black	2.27	1.90, 2.70	<0.001
Hispanic	1.24	1.06, 1.46	0.009
Other Non-Hispanic	2.45	1.55, 3.88	<0.001
Birth cohort=No	1.44	1.26, 1.65	<0.001
Medicare	0.60	0.46, 0.69	<0.001
Medicaid	1.24	1.05, 1.47	0.011
Uninsured	0.74	0.62, 0.88	0.001
Neighborhood Poverty >30%	1.55	1.27, 1.90	<0.001
Speaking English at home	1.56	1.37, 1.79	<0.001
Ever had an HIV test	8.58	7.24, 10.16	<0.001
Gay/Lesbian	1.84	1.25, 2.71	0.002
Bisexual	2.31	1.83, 3.89	0.002

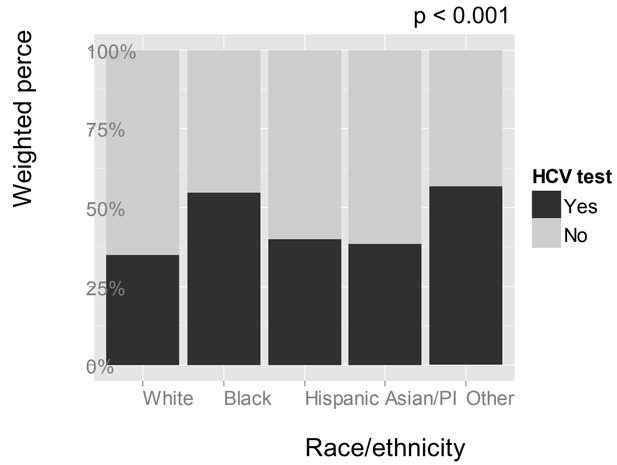


Figure 1: Individuals who report Black or "Other" as Race/Ethnicity are significantly more likely to have received an HCV test.

Discussion

- Hepatitis C testing initiatives have increased in NYC in recent years
- HIV/AIDS community service agencies are increasing being contracted to provide HCV testing
  - 86.5% ever tested for hep C also tested for HIV) (p < 0.001)
- Hepatitis C testing is primarily being offered to HIV risk population (younger, African American, gay/bisexual)– different risk profile associated with hepatitis C.
- Providers are more likely to target African Americans, Hispanics, other Non-Hispanics, and neighborhood poverty > 30%.
- 1945-1965 cohort at highest risk in NYC, and are not being adequately targeted. Hispanics at higher risk than African Americans & less likely to test
- People who do not speak English at home or are uninsured, or are in the 1945-1965 birth cohort are significantly less likely to have received a test.

Presenter: [redacted] Instructor: TDV

Item	Max score	Score	Comments
Introduction provides motivation and background for the project	5	5	HEPC TESTING (GOOD BACKGROUND)
Descriptive statistics include a table and provide a clear overview of the dataset	5	5	
Methods corresponding to the Results section are correctly described.	5	4½	
Statistical methods are appropriate for the type of data and the research question	5	5	
Results include figures or tables for key results. Figures and tables are easily interpretable.	5	4½	
Graphs and tables are labeled, have succinct and descriptive titles and captions	5	4½	
Results of any hypothesis tests are succinctly stated, confidence intervals given if appropriate.	5	5	
Thoughtful Summary provided, not just repeating the results	5	5	
Poster is organized and easy to follow (sections are complete but include only relevant information only, are clearly marked)	10	9¾	
TOTAL	50	48¾	

Presenter: [redacted] Instructor: Levi

Item	Max score	Score	Comments
Introduction provides motivation and background for the project	5	5	[illegible] tending notes excellent
Descriptive statistics include a table and provide a clear overview of the dataset	5	5	very nice table
Methods corresponding to the Results section are correctly described.	5	5	
Statistical methods are appropriate for the type of data and the research question	5	5	
Results include figures or tables for key results. Figures and tables are easily interpretable.	5	5	
Graphs and tables are labeled, have succinct and descriptive titles and captions	5	5	
Results of any hypothesis tests are succinctly stated, confidence intervals given if appropriate.	5	5	Great table of OR, CI, p-val
Thoughtful Summary provided, not just repeating the results	5	5	
Poster is organized and easy to follow (sections are complete but include only relevant information only, are clearly marked)	10	10	Great poster.
TOTAL	50	50	

Final Group Literature Review Paper

Title: *The efficacy of mental health services in reducing recidivism among juvenile offenders*

Authors:

Grading Rubric	
	Points
Content: (5 points) - Topic is clearly defined and explained (1) - Articles chosen have different perspectives on the issue in question (1) - Criteria for inclusion or exclusion of articles explained (1) - Adequately describes the current state of research on the issue (1) - Articles are summarized and presented correctly, clearly, concisely (1)	1 1 1 1 1
Writing Style: (5 points) - Readability (organized, coherent, flows well) (1) - Syntax sentence structure; spelling, grammar, punctuation (1) - Follows guidelines from syllabus (font, margins, page length, etc.) (1) - Paper is organized in accordance with sections in sample articles provided in BlackBoard (1) - All citations properly follow the proper APHA/AMA format (1)	1 1 1 1 1
Analysis: (5 points) - Demonstrates ability to synthesize the articles reviewed (1) - Identifies problems with the existing literature (1) - Identifies avenues for future research (1) - Creative in criticism and ideas for future research (1) - Provides clear and concise conclusions based on the review (1)	1 1 1 1 1
Overall Improvement Since Last Paper: (5 points) - Addresses substantive comments of reviewer (1) - Corrects all stylistic errors noted by reviewer in first draft (1) - Expands on any areas that required elaboration (1) - Incorporates additional research/analysis not presented in 1st draft (1) - Demonstrates collaborative effort of entire team (1)	1 1 1 1 1
Total Points Earned (out of possible 20):	20

Other Comments: Well done! It is evident that group worked well as a team to write a thoughtful analysis that flows well. See only minor edits and comments on attached document.

The Efficacy of Mental Health Services in Reducing Recidivism Among Juvenile Offenders with Mental Health Issues: A Review of Selected Literature

PH 755.01, Fall 2015
Collaborative literature review

Abstract

Youth in juvenile detention have a high prevalence of mental health conditions and often lack prior access to appropriate mental health services. Services provided while in detention may be inadequate and these youth are often already at an increased risk of being rearrested. This paper reviews selected literature identified by specified criteria. We attempt to assess how different mental health programs provide care in an effort to reduce recidivism rates among juvenile offenders with mental health issues, by looking at outcomes such as number of rearrests, time until recidivism, and seriousness of reoffense. We review the efficacy and effectiveness of conventional, multisystemic, wraparound and diversion programs. Multisystemic, wraparound and diversion programs appear to be more effective than conventional approaches in reducing recidivism rates among juvenile offenders with mental health conditions. It is recommended that ~~These~~ programs addressing underlying conditions and socio-contextual aspects of the individuals' lives that may contribute to their recidivism and mental health conditions be implemented~~.~~ i~~I~~n order to reduce recidivism rates and improve individual and communal quality of life., ~~it is important to implement these programs.~~

Introduction

Commented [LR1]: Good overview!

Formerly incarcerated individuals are some of the most frequently stigmatized individuals in the United States. Depending on socioeconomic position, age, and health conditions, this stigmatization can create barriers that prevent successful rehabilitation. Equally, if not more vilified, are people living with mental health conditions. The proportion of youth with mental health conditions in detention centers is significantly higher than the proportion within the general public.[1] According to the National Center for Mental Health and Juvenile Justice (NCMHJJ), one in five youth experience a severe mental health disorder in their lifetime, while in the juvenile justice system about 70% of youth have at least one documented mental health condition.[2,3] These mental health conditions include mood, conduct, and anxiety disorders which, according NCMHJJ, can influence or lead to "disruptive or inappropriate behaviors". Many communities lack access to adequate mental health care and are often forced to utilize the juvenile justice system's mental health services.[3]

Commented [LR2]: Citation?

Many juvenile detention centers were built in the 1990s with the intent to address increasing crime rates amongst youth. These facilities grew to have a high prevalence of individuals with mental health disorders, often receiving inadequate care.[2,3] Juvenile offenders with mental health conditions are also at a higher risk for poor physical health, education, and occupational outcomes, which may further perpetuate high recidivism rates. The conditions of a high rate of recidivism coupled with a lack of proper care for juvenile offenders with mental health issues are pushing researchers and mental health professionals to reevaluate the effectiveness of mental health treatments for juvenile offenders. We expect to find that programs that address the underlying conditions influencing mental and behavioral difficulties will be most

effective in reducing recidivism. For example, programs that involve family members and account for and have the capacity to address the youth's social circumstances, such as educational, employment or even transportation needs, are most likely to be effective.[2,3]

Methods

Commented [LR3]: Good section!

To prepare this narrative review, the authors searched the databases PubMed, PsycINFO, and PsycARTICLES. We utilized various combinations of the search terms "juvenile," "mental health," "recidivism," "mental health service," and "adolescent." Articles were considered for inclusion if they referred to an adolescent population. No specific age criteria were used, since "juvenile" is not uniformly defined across jurisdictions. Furthermore, we included articles that described studies or evaluations attempting to assist juvenile offenders with mental health needs, but we did not require that the interventions have any specific characteristics. Additionally, we only evaluated studies that were conducted in the United States. We required that articles examined an outcome related to recidivism, such as number of rearrests, time until recidivism, or seriousness of reoffense. We focused on studies that evaluated the effectiveness of said programs, and included randomized control trials, quasi-experimental and observational studies.

Findings

Commented [LR4]: Good summary of what you found and how articles were selected.

We used the search terms *adolescent recidivism "mental health services"* in PubMed, which yielded 46 articles. We searched for "*mental health" AND juvenile AND recidivism* in PsycARTICLES and PsycINFO, obtaining 357 unique articles between the two databases. Some of these articles were duplicates with PubMed findings, and additional articles were identified through reviewing the reference sections in key articles.

In total, we identified 25 articles that fit our inclusion criteria. Three of these examined conventional mental health services, 6 examined juvenile mental health diversion initiatives, 2 examined wraparound programs, and 10 examined multisystemic therapies (MST). Four were categorized as 'other focus' including a meta-analysis on modified cognitive behavioral therapy (CBT), a meta-analysis on residential treatment, a study on modified CBT, and another on adventure therapy. In selecting articles to focus on, we chose to examine conventional approaches, multisystemic therapy, wraparound programs, and diversion programs. The number of articles and evidence provided on these interventions allowed the authors to comment on the apparent effectiveness of these interventions.

Discussion

Conventional Approach to Lowering Recidivism Rates. Conventional approaches to therapy generally focus on the individual and his or her mental state, without fully accounting for or involving their environment, social circumstances, living conditions, and relationships that influence their behaviors. In a study observing the time-to-recidivism following detention release among 8,363 Indiana juvenile offenders, researchers hypothesized that providing mental health services within detention facilities would decrease recidivism. While the program was successful at identifying youth with mental and behavioral health needs, those who received the services actually had higher recidivism rates, compared to those who did not. This was likely due to the fact that only those with the highest risk to recidivate received treatment because they had the most serious mental and behavioral health needs. Thus, the receipt of detention-based behavioral health services served as a proxy measure for the seriousness of the youth's mental and behavioral health challenges.[4]

Commented [LR5]: Interesting.

Another study investigated whether a new mental health screening program predicted reduced recidivism.[5] It attempted to increase the usage of conventional mental health services among juvenile offenders with mental health issues and in turn decrease recidivism. However, the program was unable to increase service usage and as such, any decreases in recidivism rates could not conclusively be attributed to the program's effect. In fact, recidivism was higher amongst the post-implementation cohort due to separate but simultaneous efforts by the local jurisdiction to reduce detention sentencing for youth who had committed less serious crimes. This caused a demographic shift within the detention center, such that post-implementation youth had a higher risk of recidivating, on average, compared to pre-implementation youth.[5] The research thus highlights the importance of taking a more holistic approach to understand the various dynamics that influence the relationship between mental health and juvenile recidivism.

Commented [LR6]: How determined?

Commented [LR7]: Good transition.

Multisystemic Approaches to Lowering Recidivism Rates. Multisystemic psychosocial interventions are intensive short-term treatments that address multiple factors of influence such as family dynamics and community environments in youth offenders with mental health conditions.[6,7] Multisystemic therapy (MST) has been demonstrated to reduce recidivism in chronic juvenile reoffenders.[8,9] The existing research on multisystemic approaches documents various recidivism-related outcomes such as the seriousness of the next offense,[10] time between offenses, the number of offenses or subsequent detentions,[11] and long term rearrest rate.[12] Multisystemic therapy can incorporate a variety of other programs, including transition planning. Transition planning from a juvenile incarceration facility generally consists of the youth being assigned a case manager prior to discharge who assists in connecting to various services, such as educational, health, and economic assistance. The case manager is meant to remain in contact

Commented [LR8]: Concise and thorough summary of the literature.

with the youth even after discharge. Within multisystemic therapy, transition planning has been shown to minimize recidivism among juvenile offenders with mental health conditions.[13]

An observational study of juvenile offenders with mental health conditions incarcerated for over six months found that only 20.5% of the youth received mental health services.[13] Receipt of detention-based mental health care in coordination with transition planning and post-release services, such as substance use counseling and financial assistance, successfully reduced recidivism amongst juveniles with mental health needs. Specifically, those who participated in the intervention had 0.09 times the odds of 12-month recidivism (95% CI .01-.77) compared to those who did not.[13]

A similar study looked at the Family Integrated Transitions (FIT) intervention program in Washington State~~,~~ that~~which~~ included multisystemic therapy, dialectical behavior therapy, which is therapy that aims to build self-worth, and to help understand how to deal with heightened emotions, and motivational enhancement, which uses motivational techniques to provide very rapid change that feels intrinsically motivated.[10] One hundred five adolescents who were released from incarceration were in the FIT program and 169 were in the conventional therapy comparison group. After 36 months in the program, they found a 30% decrease in felony recidivism in the FIT group. A great strength of this study is the 88% participation rate among eligible youth. Although this study has profound implications, there are some potential limitations in generalizability. Before scaling the program out, it would be important to understand any specific aspects of the local community landscape that were essential to the program's success in Washington State.[10]

Commented [LR9]: Yes!

The above studies describe important evidence supporting MST programs as an effective method to reduce recidivism. These studies were all non-experimental in design, leaving them

relatively susceptible to confounding. However, a randomized control trial in Missouri found similar results, observing recidivism rates among 176 juvenile offenders from 1983 to 1986,[14] followed by a 13.7 and 21.9 year follow up period.[12,15] This provides strong evidence for a causal effect of MST on reduced recidivism, when considered with the other evidence. In this study, investigators found that the multisystemic therapy was significantly better at reducing recidivism compared to conventional therapy, over both short and long term follow up periods. Over the 13.7 years of follow up observed, youth in the control group were 4.25 times as likely as youth in the treatment group to be rearrested and 2.57 times as likely to have a violent offense rearrest. Of those treated with conventional therapy, 81% recidivated, while only 50% of the MST group recidivated.[12] These trends remained the same during the 21.9 year follow up period. The felony recidivism rate was significantly lower in the MST group compared to those treated with conventional therapy (34.8% vs. 54.8%). Even the misdemeanor rate among the conventional therapy group was five times greater than the rate among the MST group.[15] This longitudinal study provides evidence that multisystemic therapy can have a long term beneficial outcome. One limitation is that results cannot be generalized to youth with psychosis or dementia, since those youth were excluded from participating.[12,14,15]

Commented [LR10]: Good analysis.

Wraparound Programs. Wraparound programs provide individualized care by incorporating the individual's family, community, health care providers, and any other service providers necessary to manage all sources of behavioral problems. Moreover, they have been shown to predict a delay in recidivism. Pullman et al. conducted a study in 2006 of a wraparound program to document the number of days between the initial offense and a re-offense for those who participated. This program, like other wraparound programs, was specifically tailored to

every individual participant. If, for example, there was a participant with a coexisting mental health condition, a substance abuse problem, and financial hardship, the program would connect the young person with substance abuse and mental health counseling services, as well as identify sources for financial assistance, to allow for the youth to enter back into society after their probation and to promote their well-being in doing so. Wraparound participants re-offended in an average of 344 days while the comparison group reoffended in an average of 104 days.[11] Though these results are promising, it is unknown whether the wraparound program would continue to perform better in the long term, such as by reducing total number or seriousness of rearrests.

Diversion Programs. Diversion programs are different from the approaches previously discussed because they seek to minimize an offender's exposure to the juvenile justice and detention systems, while the above programs assist youth who have already been incarcerated or adjudicated. Some researchers have concluded that the juvenile justice system is ill-equipped to handle the complexities of mental health conditions and that a single system to treat the entire population of offenders is ineffective at reducing recidivism rates.[16] Furthermore, exposure to the juvenile justice system has been shown to predict increased adult recidivism.[17] Diversion programs can prevent out-of-home placement, criminal charges and the establishment of a criminal record, providing tailored behavioral health treatment while keeping youth within their communities.

In Texas, evaluators compared the reoffense rate of participants in the Special Needs Diversionary Program with participants in other court-ordered programs and found that participation in the SND program significantly decreased re-offense rates.[16] This suggests that juvenile offenders with mental health issues benefit from receiving mental health services

outside of a detention center more than those who receive treatment as usual. The Enhanced Mental Health Services Initiative (EMHSI) implemented a diversion program for youth offenders in Texas who had been formally sentenced to probation or received deferred adjudication and had a clinical mental health diagnosis. The program used a waitlist comparison group with propensity score matching. Participants were approximately 23% less likely to be rearrested for a crime and 8% less likely for a violent crime within one year.[18] This suggests that diversion programs tailored for juvenile offenders with mental health conditions are effective at reducing recidivism.

Another evaluation by Behnken et al. analyzed a juvenile mental health court in Santa Clara, California, using a pre-post cohort design.[19] They studied 64 participants who had mental health conditions and were on probation, excluding individuals who had committed a violent crime, or had certain personality disorders. The mean number of arrests decreased from 2.98 before participation in the program to 1.14 after participation. This supports the possible role of diversion programs in successfully reducing recidivism for juveniles with mental health conditions. Although these results are promising, limitations include a small sample size and study methods lacking a concurrent comparison or control group.[19]

Commented [LR11]: Couldn't they also be diverted to Rx rather than detention?

Conclusions

Although the high prevalence of mental health disorders amongst juvenile offenders has been acknowledged and many detention centers offer basic mental health services, the development and evaluation of high quality and successful programs to reduce recidivism still lags. High recidivism rates are also associated with learning disabilities, unemployment, alcohol and substance abuse, and development of comorbidities, demonstrating the complexity of

treating affected individuals.[3] These factors inhibit members of the population from moving towards a stable and healthy lifestyle. Therefore, it is not surprising that our review found that programs that integrate individuals at risk of recidivating into community-centric models to address the issue were more successful. Multisystemic therapy and wraparound programs address the individual's social and structural environment and create individually tailored interventions. In contrast, conventional therapy is limited because it does not actively incorporate influential factors such as family, friends, access to services, community and socioeconomic position. Diversion programs take a preventative approach by minimizing contact with juvenile justice systems and detention. They often incorporate services similar to those found in MST and wraparound programs,[16] but they have the added capacity to remedy the over-representation of mentally ill youth in juvenile justice systems.

Commented [LR12]: Yes, an important insight.

In the long run, if adequate and successful mental health services are not provided it can lead to many issues that not only impact individuals but society as a whole. Communities feel the effect of the criminal activity and families suffer the trauma of involuntary separation when incarceration occurs. Developing community-based programs that support juvenile offenders with mental illnesses can serve to reduce recidivism rates and decrease trauma associated with incarceration for the individual, their family, and their community.

These findings highlight the need to continue work refining and evaluating effective interventions. Intervention research should focus on ensuring juvenile offenders receive appropriate mental and behavioral health care that addresses their life circumstances, supports them to live productively, and ultimately minimizes future encounters with the criminal justice system. Research should continue and focus on the community-based approaches, with special attention on diversion programs since this is a newer development. Additionally, it is not clear

how these programs will work in different settings since they rely heavily on the resources available in the individual's community. While additional research is needed, overall, it appears that programs such as multisystemic therapies and diversion programs hold promise to address long term gaps in the competence of the juvenile justice system's handling of offenders with mental health conditions.

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Final Group Literature Review Paper

Title: *Gender, family, school, incarceration and work place as socially structured influences on mental health*

Authors:

Grading Rubric	
	Points
Content: (5 points) - Topic is clearly defined and explained (1) - Articles chosen have different perspectives on the issue in question (1) - Criteria for inclusion or exclusion of articles explained (1) - Adequately describes the current state of research on the issue (1) - Articles are summarized and presented correctly, clearly, concisely (1)	1 1 1 1 1
	5
Writing Style: (5 points) - Readability (organized, coherent, flows well) (1) - Syntax sentence structure; spelling, grammar, punctuation (1) - Follows guidelines from syllabus (font, margins, page length, etc.) (1) - Paper is organized in accordance with sections in sample articles provided in BlackBoard (1) - All citations properly follow the proper APHA/AMA format (1)	 1 1 1 1 .80
	4.8
Analysis: (5 points) - Demonstrates ability to synthesize the articles reviewed (1) - Identifies problems with the existing literature (1) - Identifies avenues for future research (1) - Creative in criticism and ideas for future research (1) - Provides clear and concise conclusions based on the review (1)	1 1 1 1 1 5
Overall Improvement Since Last Paper: (5 points) - Addresses substantive comments of reviewer (1) - Corrects all stylistic errors noted by reviewer in first draft (1) - Expands on any areas that required elaboration (1) - Incorporates additional research/analysis not presented in 1st draft (1) - Demonstrates collaborative effort of entire team (1)	1 1 1 1 1 5
Total Points Earned (out of possible 20):	19.8

Other Comments: Exceptionally well written, organized and presented (except for the small font!). See attached document for only very minor edits and comments.

Gender, Family, School, Incarceration and Work Place as Socially Structured Influences on Mental Health

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Article history:
Submitted: 11, November 2015
Accepted: 16, December 2015

Abstract: The purpose of this literature review was to analyze the social structures that influence mental health in different populations and said populations' access to mental health services. Mental illnesses are prevalent in various populations and have provoked societal interventions on a large-scale. We reviewed research-based literature on how certain social structures influence the psychological, emotional, behavioral and social well-being of individuals. The five social structures examined here are gender, family, schools, mass incarceration and occupation.

Methods: Literature was gathered using the Boolean coding system & MeSH Terms. Criteria used for inclusion were that the papers identified a social structure of interest and examined its effect on a mental health outcome. Some examples of mental health outcomes searched were depression, anxiety, PTSD, and schizophrenia~~, etc~~. We excluded studies that were not relevant to our research due to confounding factors, articles older than 15 years to date or if the mental health outcome was not a primary effect of the social structure.

Results: The literature shows that social structures can contribute significantly to mental health outcomes. The lack of organized institutional supports or the inability or unwillingness of individuals to take advantage of such services can leave individuals vulnerable to a variety of negative mental health outcomes.

Introduction

Social structures deeply affect the means by which a society is governed both on an institutional and individual level. They are composed of social constructs that affect overall social norms and behaviors and can have beneficial or detrimental effect on individual health outcomes (Figure 1)[1]. For the purpose of this review, we define mental health outcome as the status of an individual's mental health that has been self or professionally diagnosed. The social structures examined in this review are gender, family, schools, mass incarceration and employment, each of which have been shown to have a profound effect on the mental health of individuals.

Gender as a social construct is a social structure that is deeply ingrained in cultural ideologies affecting equality and social norms. The family structure is a fundamental component in overall development and well-being of children and can form part of the foundation for social process. Similarly, the educational structure is an institution that significantly influences childhood

Figure 1 Contributing factors to mental health and well-being



health outcomes. Mass incarceration can have overall deleterious effects on the health of individuals, encompassing those who are both directly and indirectly involved. Finally, occupational environments and the physical and

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Commented [LR4]: Good overview of your topic.

emotional toll placed on individuals during their daily work are shown to have direct effects on mental health. The methods by which each of these individual social structures affect mental health and well-being is examined, with the full understanding of the many other contributing factors to mental health and well-being not explored here.

Methods

Literature was gathered using the Boolean coding system & MeSH Terms. The websites used to identify this literature were PubMed, Google Scholar, SocIndex, and PsychInfo databases. Queries were gathered from September 2015 to December 2015. Literature was analyzed up to the present to account for the most current data on mental health issues and disorders. We restricted our review to studies that focused on specific social structures and how they target a variety of populations. Keywords and terms used in our search include gender, prison, families, schools, depression, anxiety, mental, PTSD, schizophrenia, psychiatric, stress, work, emotional, psychological, social.

Gender

Gender is embedded deeply in social structure because it operates not only within social processes at the individual level, but across institutional dimensions of society. Gender affects social behaviors and expectations which may define opportunities and restraints.[2,3] A gendered social structure may explain gender inequalities in health. Research suggests that the impact of gender on mental health usually stems from societal expectations of the various positions and roles that are either assigned or expected from men and women in the home, work force or in social groups.[4–6] The very definition of gender has evolved; many individuals do not identify with the traditional gender groups and may, therefore, face different mental health impacts.

Effects of gender contribute to whether individuals with diagnosed illnesses seek or decline to seek treatment. We see disproportionate effects on mental health differences based on the division of labor by gender. For example, gender differences and work related stresses such as socio-sexual behavior in the workplace, masculine expectations, etc[3–5] contribute to differences in prevalence of mental illness. In the home, women tend to experience more housework-related stress, which is often exacerbated by having a paying job outside of the home or when men do not share the housework load.[6] Interpersonal violence in the home often disproportionately affects women and consequently their incidences of mental illness.[7] Traditionally, men are less likely to report mental health problems than women and therefore receive less treatment for any existing conditions. Women are twice as likely as men to be treated for depression over their lifetime, even when they exhibit the same symptoms[8,9] but men are five times more likely to be diagnosed with anti-social personality disorder.[10] Ideas about masculinity and the stigma of mental health are among the greater contributing factors for low reports of mental health among men.[10, 11] One study among transgender adults showed almost a third of the participants took prescription drugs for nonmedical reasons linked to emotional distress and this was significantly associated with psychiatric symptoms.[13] Similar studies have found that poor mental health in transgender adults have resulted in poor physical health as many are fearful of seeking health services and that the greatest risk factors for poor mental health stemmed from victimization and stigma.[14,15] Another study on transgender youth recognized that they are also often at risk for poor mental health, especially because of rejection and marginalization. Family support played an important role as there were fewer depressive

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symptoms in transgender youth who had more parental support.[16] It is clear that gender matters in mental health outcomes and any efforts towards prevention and treatment cannot be gender neutral because there are certain risks that are gender specific.

Family Structures

Family structures are an influential component in the social processes and well-being of a child, his/her parents and for individuals within society. The composition of a family structure consists of residential and biological components, including whether parents and children are related by blood or marriage.[17] The influential component in social processes linked to family structures is the support system, which is beneficial between parents and a child within families.

Research suggests that the composition of a child's family origin influences mental health symptoms.[18] As children grow up, they may experience various family structures, which may appear "normal" to the child until they interact with other individuals outside of their family structure. The two common types of family structures are traditional (two parent) families and non-traditional (single parent and blended) families.

Over the past few years, the structures of families have become diverse and complex, with an increase in the pattern of single parent and blended families. These changes appear to be influenced by social factors such as socioeconomic status (SES), positive and negative interactions and stress. The sudden transition of family structures can have a profound impact on the well-being of individuals within a family, especially on children's experiences and life trajectories.[19]

The prevalence of traditional families has decreased from 85% in the 1970s[17] to 60% in 2009.[20] Retrospectively, data has shown that children are generally physically and mentally healthier in traditional families than non-traditional families. This data can be interpreted differently if measurements for race were included.

Family transitions seem to have a great impact on the mental health well-being of children in families. Research has shown that there has been a decline in marriages and increase in divorce rates. These transitions such as death, divorce, remarriage and separation can cause some adverse effects in the well-being of a child. These marital transitions of divorce or separation seem to be linked to stress factors that are experienced by the parents. During these times, there may be an increase of internalizing and externalizing problems by the children in these families, which can be a result of lack of social support and economic instability.

Schools

Schools influence the overall mental health of an individual and especially of young people. In the United States, students spend a large portion of their day in the school setting. From interacting with other students to interacting with the teachers, schools play a large role in the overall development of a student's self-esteem and character traits. Mental health is becoming more prevalent in the agenda for schools, as administrators are becoming more aware of the linkage between providing social support to students who are exhibiting behavioral problems or not succeeding academically. These students could be dealing with issues at home that affect their ability to focus in the classroom.

The need for mental health support in school settings is especially significant in middle and high schools where young people experience significant pressures from teachers and peers. In fact, the onset of most mental illness in adults can be traced to childhood and adolescence.[21]. The Mental Health in Schools Act of 2015 designates a requirement for schools to provide comprehensive

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mental health programs for children who deal with trauma and violence. A US study in an urban public school with 13 and 15 year old youth from economically disadvantaged households found that the relationship between mental health and academics was statistically significant; in fact, teacher support and school attachment were positively related to academic motivation[22]. When students feel emotionally supported by the school staff, they are more likely to stay motivated to complete their academic tasks. For schools where there is a lack of psychological or emotional support, school health centers have been created as hubs for connecting students to the services they need to cope with any struggles they are going through.

Many mental health clinics are developing partnerships with their local departments of education to tackle the mental health stigma of youth. As stated on the DOE website, there are over 200 school based mental health programs in clinics and offices throughout NYC. In order for schools to fully support a student's well-being, they have to be connected to additional resources, as not all schools have a school psychologist or a mental health counselor. Social workers, guidance counselors and attendance counselors are staffed at schools, but lack the full skills and training to target children with diagnosed mental problems such as depression or anxiety. As part of an initiative to understand adolescents' access to care and their mental health outcomes, mental health outcomes were measured in some school health centers in Alameda County, California. In the data gathered, school health centers were used by almost one third of students as a source for counseling.[23] Students in the study noted that they utilized the school health center because of confidentiality, free services, convenience and youth-friendly staff. As more schools see the need for these services for children, more youth will succeed in their personal lives and learn the skills needed to deal with life's problems. Because young people are uniquely at risk for developing mental illness, school administrations need to continue to ensure that students have the tools they need to care for themselves, especially given the challenges of youth accessing therapy or other support programs outside of school.

Mass Incarceration

The United States comprises 4.4% of the world's population but accounts for 22% of all its prisoners.[24] The prison system, therefore, is a significant social structure that, besides having political as well as economic repercussions, also significantly affects health.[25] The mental health of the imprisoned population is particularly vulnerable and these effects also extend into the communities from which the imprisoned are drawn.[26]

One study examines the collateral mental health effects in neighborhoods with a high prevalence of incarcerated individuals. Results show that there is a higher risk of psychiatric morbidity, specifically major depressive disorder and generalized anxiety disorder, among residents living in neighborhoods with higher prison admission rates.[27]

Within prisons though, because of policies such as the criminalization of substance abuse together with deinstitutionalization, many mentally ill individuals are diverted away from early treatment and are instead directed toward early punishment. The co-occurrence of severe mental illness and a history of substance abuse and prior incarceration were predictors for future imprisonment.[28] Of individuals with severe mental disorders, such as schizophrenia or other schizo-affective disorders, 70% also had substance abuse disorders at the time of imprisonment even though the majority were non-violent.[29]

The war on drugs, which disproportionately affects ethnic/racial minorities,

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is known to be discriminatory, consequently leading to inequitable treatment by law enforcement and the courts.[30] Moreover, it has previously been shown that the stigma or humiliation of racial profiling leads to psychological distress.[30]

A comprehensive study was conducted of over 45,000 first time NYC jail admissions between 2010 and 2013. A total of 14.8% were found to exhibit some kind of mental disorder upon intake. These individuals who were mentally ill upon entering into the prison system had longer jail stays, greater susceptibility to injury and higher rates of placement in solitary confinement.[25] Moreover, the study found that an adverse mental health diagnosis may have an association with placement in solitary confinement; 65% of all prisoners who were actually placed into single housing units during their stay were diagnosed with a mental health condition within 10 days before or after placement in solitary confinement and yet most, 71.1%, of the mentally ill prison population was diagnosed within the first 7 days of admission. This means that based on these findings, poor mental health may have developed during prison or as a result of confinement.[25] A separate analysis of the same population also found a significantly increased incidence of self-harm, a symptom of mental illness, in the segregated population.[31]

Disparities were also prevalent in the assessment and treatment of these mentally ill individuals within the NYC jails. Non-Hispanic black and nonwhite Hispanic males were more likely to elicit a punishment response rather than a treatment response; only 8.8% of whites, compared with 38.8% of blacks and 26.0% of Hispanics were ever placed in solitary confinement.[32]

So apparent are the adverse psychological effects of segregation that one study identified a set of specific psychopathological symptoms associated with solitary confinement, referred to as confinement in single housing units (SHU) in the study, and termed them together as a clinical diagnosis called SHU syndrome.[33]

However, some cross-sectional studies, did not find significantly different psychological effects of segregated individuals compared with their non-segregated counterparts. It is noted though, that the studies examined short term segregation and did not account for the inmates baseline psychological state before confinement.[34]

Many jails and prisons lack adequate staff or are afflicted with budgetary constraints which impede the provision of treatment of mentally ill prisoners as well as the implementation of measures to prevent adverse mental health outcomes among the population.[35] Without the resources to provide sufficient mental health care and proper staff training in order to care for the safety of the imprisoned, the detrimental effects of the prison system on mental health are apparent and must be addressed.

Workplace

Work and occupation also have a profound effect on an individual's psychological and physical state. The stressors of a job and the work-reward balance can impact an individual's physical and emotional well-being in both positive and negative ways. Some workplace environments are especially supportive for their workers resulting in lower prevalence of mental illness. Certain professions also attract certain personality types, thus skewing data for the prevalence of mental illness between different occupations.[36] Moreover, stressors and risk-factors differ by occupation, by managerial support, size of the employer and a number of other variables. Research shows that psychological demands, low reward, emotional demands and job insecurity are predictive of major depressive disorder and/or generalized anxiety disorders.[37] Psychological demands on individuals in the workforce include whether there is sufficient time to complete the

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work at hand, the volume of work, and whether there are conflicting demands placed on the worker.[36] Workforce situations where there is high effort and low reward can cause those with a high-need for control to respond negatively, becoming more stressed and disease-prone than those who have less need for control.[36]

Studies examining mental health in the workforce have found direct relationships between profession and well-being. Risk factors for depression involve workplace situations that take away employees' autonomy – especially when the occupation involves 'caring' for others as part of the work role, and particularly where there is dependence on others for their livelihood. One example would be healthcare workers, who studies show have higher rates of psychological ill health compared to non-healthcare workers for reasons consistent with the demand-control model.[38] Moreover, the physical demands involved in the healthcare profession (e.g. patient lifting, positioning and transferring) conducted by nurses and other individuals in the healthcare direct service sector have been associated with work-related musculoskeletal problems and in turn, a negative effect on the overall health and well-being of employees.[39]

In addition, for those already experiencing psychological distress, many workplaces offer inadequate supports for those who need it, thus exacerbating their symptoms. In one study, over 75% of subjects interviewed identified management methods as contributory factors in their anxiety and depression and felt that unmanageable workloads had contributed to the development of their mental health problems.[40] When managers were approached, they were often dismissive because no other employees had indicated that they were having problems. Employees were found to be reluctant to disclose their condition to colleagues due to the stigma attached to mental illness.[40]

Workplace and occupational stressors can also be unique to the individual and workplace setting. For example, there have been shown to be increasing levels of violence in occupational settings usually considered to be "safe" environments (e.g., high school teachers and hospital staff, especially where there is exposure to intoxicated patients). These professions are especially prone to high stress because of the inability of individuals to express frustration when they first experience it. Several studies have pointed to the relationship between use of emotion-suppressing defenses and later mental health problems.[41]

No matter the profession, it has been shown that the social structure of the workplace can have a strong effect on the mental health and well-being of employees.

Discussion & Conclusions

None of the above social structures exist in a vacuum; and every individual contributes to and is encompassed by societal structures. More studies are needed to examine the causes and treatment opportunities for mental illness; however, the ability to implement mental health interventions and create or improve support systems in pre-existing structures (schools, prisons, workplaces) and to offer programs that are specialized for social determinants (gender, adverse family structures) can work together to improve the health and well-being for individuals at risk for developing mental disorders.

The research on gender specific mental health interventions suggest that there are often other variables in play that will determine how successful the intervention is. A conceptual framework may be key in addressing gender specific mental health issues, one that takes into account the individual, environment and system-based issues. For example, women are more likely to face more barriers to treatment of mental illnesses and therefore are less likely to seek

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treatment. Interventions aimed at improving the mental health of women should consider the interface of primary care and improve the ease of access for women.[42] It appears that with men, age is a significant determinant of how and when a man may seek mental health treatment or take advantage of services aimed at promoting better mental health.[43] Interventions for men therefore should focus on age sub groups and comprise activities appropriate to age groups.[43] The National Alliance on Mental Illness recognizes that LGBTQ individuals are often hesitant about seeking medical care, particularly mental health services. Mental health interventions aimed at LGBTQ individuals should be ministered by culturally competent and knowledgeable providers who understand the specific issues that LGBTQ individuals face.

Family therapy or counseling is a proposed treatment that is deemed effective in alleviating stress and depression symptoms that may be pressuring the children and parental figures within a family. The counseling would also create space to address the internalizing and externalizing problems that have occurred for the children, as well as adults. There have been a few studies on parenting intervention programs addressing mental health problems and parental discipline. One intervention, was a Multilevel Parenting Program that was geared towards individual families but included the general public population in South Carolina. The program consisted of 5 levels , with components ranging from mass media information to mini trainings to 12-hour long sessions. Each level covered key concepts relating to parenting such as learning to deal with your child's aggressive behavior. A randomized control trial with the mass media level component was conducted in 18 counties in South Carolina. Results from this study were significant in showing the positive effects of parenting intervention of the entire population.[44]

Adolescents are especially at risk for mental health disorders. School and academic performance can be indicators of a young person's mental well-being. Students who are provided mental health therapy & treatment are more likely to succeed academically. The correlation between doing well academically and obtaining financial stability in the future are correlated in the United States, but students can only obtain these goals by feeling happy and receiving emotional support.

To address the wide-scale issues of mental illness in young people and adolescents, school-based interventions can have a profound effect. On site clinical staff at schools must continue to be available to support the mental health of students. Psychologists, licensed medical social workers, psychiatrists, and clinical social workers all play a role in providing students with the treatment necessary to overcome emotional and mental health issues.

Based on the available data, the mentally ill are largely incarcerated for a number of reasons; the most apparent being the insufficient and inadequate mental health treatment outside of the prison system (due to budgetary cuts or lack of access, etc.). A second important cause is the war on drugs; many mentally ill individuals, mostly non-violent with few resources are imprisoned because of the criminalization of drug use. For those individuals who are already incarcerated, imprisonment itself may exacerbate the symptoms of those with mental illness or cause psychopathologies in those with no previous mental disorders.

However some incarceration systems are affecting change. The results of the large scale 2013 study of NYC jails has prompted a movement towards the ban of solitary confinement among any individuals diagnosed with a mental illness; prisoners instead would be diverted to a more clinical setting for treatment. Furthermore, measures to eliminate long term solitary confinement have also begun to take effect.

Still many of the factors noted above must be addressed in order to effect change towards better mental health throughout the incarcerated

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and other interconnected populations. These interventions include improvement of mental health treatment within and outside the prison system, effecting positive change of health and federal policy (such as elimination of the war on drugs), as well as improve the conditions within jails and prisons throughout the US.

Because of the prevalence of workplace mental health risks, the working environment offers a unique opportunity for interventions; working conditions are a modifiable risk factor.[45] A 2014 study identified a three-pronged approach[45] for workplace interventions:

1) Protect mental health by reducing work–related risk factors;
2) Promote mental health by developing the positive aspects of work as well as worker strengths and positive capacities; and
3) Address mental health problems among working people regardless of cause.

Adapting these integrated interventions to improve working conditions in any workplace setting will aim to improve or mitigate mental health comes. Proven therapeutic intervention methods in the workplace focus on identifying and recognizing strengths instead of trying to identify and rectify what is "wrong" in an organization, group, or individual.[45] The support of organizations and human resources in implementing mental health intervention strategies will help improve workplace morale and workplace productivity, thus lowering the risk for adverse mental health outcomes.

Studies reviewing the prevalence of mental illnesses within different social structures can only point to trends, thus necessitating the need for more examination. However, through examining the effects of family structure, schools, mass incarceration and workplace setting on mental health, it is evident that environmental situations contribute to the development or exacerbation of mental illness. Interventions must be specialized, specific, and replicable in order to enact long-term positive change.

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The Social and Economic Factors That Influence Adolescent Obesity

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Abstract

Obesity is a global epidemic impacting people of all races and backgrounds. It is not simply an issue of adulthood, more and more young people are affected as well. The most recent data shows that among youth in the United States, nearly 20% are obese. Within that 20%, youth with low socioeconomic status [SES] are at twice as likely to become obese than their wealthier peers. In order to solve the obesity crisis, we must first identify the causes of obesity for this demographic. For the sake of our research, we will define adolescent as those between the age of 12 and 18. The purpose of this paper is to identify the major risk factors that contribute to obesity in urban, poor adolescents. Through a systematic review of literature, several key components that influence obesity were identified. These factors include the child's physical location, access their location affords them with regards to healthy food availability and greenspace, safety of their neighborhood, home and family dynamics, educational opportunities, and views of their community and family on health. These issues are rarely found in a vacuum though, and sadly many urban adolescents experience most or all of them at the same time, creating barriers to their health and wellbeing.

The Social and Economic Factors That Influence Adolescent Obesity

Obesity is a concern of epidemic proportion. It is estimated that at least one third of American adults are obese, defined as having a BMI of 30 or greater and, sadly, this number is climbing based on the most recent data published in November 2015 by the NCHS (Ogden, Carroll, Fryar, & Flegal, 2015; Centers for Disease Control and Prevention [CDC], 2015). This health crisis spares no demographic, affecting those of all ages and socioeconomic backgrounds. Adolescents, defined for ~~the sake of~~ this paper as youth between the ages of 12 and 18, are particularly vulnerable (Merriam-Webster, 2015). The excess weight of these individuals has been shown to have lasting, detrimental effects. Those who are obese as adolescents are at significantly higher risk of becoming obese adults and therefore experiencing all of the horrible sequelae that accompany excess weight. Before we can address the treatment for this dangerous problem, we must first identify the risk factors and causes of the weight gain for this demographic. Public health clinicians, medical professionals and social scientists have toiled to ascertain the root of the issue and have discovered several persistent, key factors that impact adolescent obesity. They found that adolescent obesity is strongly influenced by a broad range of social and economic factors including location, safety, family dynamics, education and culture. The cornerstone issue, from which many of the others are derived, is socioeconomic status. Obesity rates in youth who grow up in low income families are double those with higher socioeconomic backgrounds (Babey, Hastert, Wolstein, & Diamant, 2010). ~~With this in mind,~~ we will delve into the factors that increase the risk of adolescent obesity with a specific focus on urban, lower income populations.

Adolescent obesity has been long studied and the latest numbers posted by the CDC are astounding. They note 20.5% of youths in America between the ages of 12 and 19 are obese.

(CDC, 2015) That is one in five. This places these young people at a dramatically higher risk of comorbid disease and other damaging complications. Among those who are obese, the CDC (2015) notes that, "70% of obese youth had at least one risk factor for cardiovascular disease." They also either have or are likely to develop pre-diabetes, diabetes, high blood pressure, sleep apnea, arthritis and depression. This translates into not only a serious financial and economic burden on the nation, but also affects the child and their family on a personal, lasting level. As previously mentioned, it is proven that children in poverty are at statistical disadvantage in this battle. This was extrapolated in a study by Bethell, et al., where their data revealed, "44.8 percent of children in poverty were identified as being overweight or obese, compared to 22.2 percent of children living in households with incomes above 400 percent of poverty" (Bethell, Simpson, Stumbo, Carle, & Gombojav, 2010). For adolescents who already experience economic and social hardship, obesity and concurrent illness only exacerbates their predicament. In order to address this daunting problem, it is important to examine what causes adolescent obesity in the first place.

One of the many factors that contribute to adolescent obesity is the location within which the young adult is raised. Included in location is the type of neighborhood, proximity to grocery stores and fresh produce, prevalence of fast food establishments, and access to open green spaces and parks. Neighborhoods with a prevalence of low income members tend to struggle to a much greater degree with these issues than their more affluent counterparts. This sets up the children raised in this environment to develop obesity and other health-related concerns.

Physical location, as noted by Monnat and Pickett (2015), can determine the health of those who live in that community. In their research, they found that adolescents who grow up in either extremely rural or inner-city, urban settings have statistically poorer health outcomes and

higher obesity rates than their suburban counterparts. This is because both rural and inner city areas struggle from lack of access to resources and are generally more impoverished. (Monnat, & Pickett, 2015) Those of lower income cannot afford the luxuries provided to suburban, middle-upper class Americans. They also lack easy access to those resources for similar reasons. There is no incentive for organic or healthy establishments to put down roots in these areas when no one within that community can afford it.

With income in mind, children within these lower income areas are further at risk for obesity due to the type of restaurants that propagate their neighborhoods. The establishments that develop generally provide cheap, fast food that the community can afford. Carpenter and Davis (2009) have noted that these fast food restaurants often set up shop near local schools to increase their revenue as well. This structuring, naturally, impacts obesity levels of the students in these neighborhoods. Through their studies, they confirmed that students who are black or low income in urban settings, near these fast food restaurants, have measurably higher rates of obesity than their wealthier counterparts (Carpenter & Davis, 2009).

While poor youth have a greater quantity of fast food consumption, they conversely have a decrease in the consumption of healthy food, specifically fresh produce. This is due to lack of reasonable proximity to grocery stores with affordably priced, nutritious food options. The accessible meals, with wallet-friendly prices, come from places such as McDonalds, Burger King, and KFC, as well as their local bodega. The bodegas are corner, convenience stores that propagate inner city neighborhoods. They sell a variety of goods, but generally lack any healthy, quality snack or meal offerings. They often further exacerbate the poor eating patterns of adolescents by providing cheap, highly processed foods and sugary soft drinks. Soda consumption patterns by teens are elevated across the entire demographic, but are particularly

elevated for those "living in low income households, single parent homes and homes which the female head (or male head if no female head) is a high school graduate," (Rao et al., 2015). Through their study they saw that the variance in consumption quantity was due, in part, to unlimited access to these beverages through the bodegas. The study also found that beginning with unhealthy food and drink choices, there is a cascade of unhealthy behaviors including lack of exercise, frequent fast food consumption, sugary snack purchases and cigarette smoking. (Rao et al., 2015) Naturally, the cascade terminates with elevated BMI for these students and the associated comorbidities.

Finally, in regards to location, lack of accessibility to green spaces and parks are a risk factor for adolescent obesity. Rates of obesity are 1.21 times higher for adolescents who live in neighborhoods without easy access to a park or recreation center (Bethell et al., 2010). Neighborhoods with safe, open, green spaces encourage activity and health among their inhabitants. Conversely communities without these resources prevent teens from participating in regular physical activity due to a lack of space. As an alternative to exercise, these students tend to spend their time participating in sedentary activities such as of video games, TV viewing and computer usage. Although not conscious or intentional, the lack of greenspace creates the perfect environment for adolescent weight gain and obesity.

Safety is another vital component of teen health and has been shown to affect their obesity rates. Like green space, the availability of sidewalks and presence or perceived presence of crime directly influence the physical activity level of teens. Students will not participate in outdoor activities if they do not feel safe or are encouraged to do so, once again promoting a sedentary lifestyle and concomitant unhealthy behavior.

Safe sidewalks encourage activity by providing a safe space for teens and their families to walk both for exercise and recreation purposes as well as a means to get to school, the grocery store and other neighborhood destinations. The ease and security with which one can move about their neighborhood has been studied and is translated into what is defined as 'walkability.' Walkability is then combined with other factors such as neighborhood structure, accessibility to green space and overall safety generating a 'walk score,' (Bethell, et al. 2010) Higher walk scores indicate that a neighborhood is well built and safe for those living there. As expressed by Xu and Wang (2015), through analysis of the national 2012 Behavioral Risk Factor Surveillance System's data, "Better street connectivity and walk score lowers obesity risk." Alternatively, lower walk scores correlate with an environment that is not safe to traverse, once again promoting a sedentary lifestyle and subsequent elevation in adolescent obesity statistics.

Another aspect of safety within a neighborhood is its crime rate. Both perceived and actual crime affect adolescents of both genders, but with slightly different behavioral outcomes. This was documented in an article published by Forsyth et al.,

> BMI was positively associated with perceived crime among girls and boys and with reported crime in girls. For girls, there was an association between higher perceived crime and increased screen time; for boys, between higher reported property crime and reduced physical activity. Perceived crime was associated with reported crime, both property and personal, in both genders. (Forsyth, Wall, Choo, Larson, Van Riper, & Neumark-Sztainer, 2015)

This pattern is likely started much younger than one's teen years through parental projections and perceptions of safety. When studying preteens it was discovered that there is, "a higher level of

parental anxiety about neighborhood safety and a lower level of children's physical activity in a poor inner city community as compared with a middle-class suburban community." (Brand, Etelson, & Weir, 2006) Children can sense and internalize fear from their parent or guardian even if it is not overtly expressed. This fear will then become part the framework from which they operate and make decisions. If the fear of unsafe neighborhood conditions is present within their parents, students likely carry it with them as well. Those who feel unsafe will likely not spend much time outside or participating in recreational activities in their community. It once again reinforces sedentary activities and weight gain.

Since all of these factors cannot always be studied well on a single variable level, there have been studies performed to examine a number of these risk factors in conjunction. The collective components of location, environment and safety in relation to adolescent BMI were compiled and published in 2012. American Journal of Preventive Medicine presented this study which commented specifically that, "Among boys living in Cluster 6, "city commercial, low SES and safety," 29.8% were obese, which was significantly higher than the 21.3% of obese boys living in Cluster 2, city residential with parks, nearby convenience food, high SES and transit." (Wall et al., 2012). They noted similar results among the girls in the study. It is important to keep in mind that when looking at adolescent obesity all of these different factors ~~interplay~~ interact and cannot be totally isolated.

mention the authors, not the journal.

Just as adolescents are influenced by the environment outside, they are also shaped by their home environment and those who raise them. The home they grow up in is a large determinant of their health and wellbeing, including their BMI. Studies have shown that child and adolescent obesity rates are elevated for those whose parent have atypical work hours or multiple jobs, have a low income or other financial stressors, lack strong, meaningful

relationships with their parents or guardians and or those who were raised in an unsafe home environment. Reference

Adolescents whose parents work multiple jobs or have non-traditional work hours often have a higher BMI than their peers whose parents work typical nine to five jobs. According to research done by Han and Miller (2008), looking at adolescents 13 and 14 years of age, those who had parents working multiple jobs or swing shifts had significantly higher BMIs than their peers. The reason for this variation, they speculated, was due to a disruption of the "work-family balance" (Han & Miller, 2008). They found that this irregular household schedule encouraged the consumption of fast food or easy, unhealthy meals accompanied with a lack of physical activity on the part of the parent and the child (Han & Miller, 2008). Parents who work multiple jobs, long or atypical hours do not have the time or energy to devote to cooking nutritious food or performing regular exercise. These practices directly affect the children by modeling and habituating these unhealthy patterns long-term. Sadly, the parents that are employed by these irregular jobs are usually those in low income neighborhoods and are poorly compensated for their time and hard work. This perpetuates the cycle of poverty and adds yet another factor into the obesity risk equation for their children. It also sets them up to remain obese into their adult years. This was demonstrated in the Wisconsin Longitudinal Study. In the study, they followed adolescents over 36 years and found those with low socioeconomic status in their teens had a higher prevalence of obesity, both at that present time and into adulthood, than their peers with better financial means (Pudrovska, Reither, Logan & Sherman-Wilkins, 2014).

Just as children whose parents work long hours are more likely to become obese, those whose parents do not work are similarly at risk. The lack of family income, commonly coupled with reliance on government assistance for survival, is a hefty source of stress to everyone in the

household. Chronic stress is known to be associated with the increased risk of obesity as well as the development of comorbid disease processes. This correlation with regards to adolescent obesity was documented in the Social Science Research Journal using a longitudinal study of 12-17 year olds and the effect of numerous stressors on their weight. They concluded that, "Among older children, the associations between mental and physical health problems and child weight status, and financial strain and child weight status were statistically significant." (Garasky, Stewart, Gundersen, Lohman & Eisenmann, 2009) They suggested several key links between stress and obesity including the likelihood that these children use food as a means to cope with their emotions, an increase in cortisol levels due to chronic stress and a lack of physical activity encouraged by the other concurrent factors related to low socioeconomic status.

Although teens tend to feel 'too cool' for their parents, studies have shown that parental involvement in their lives, including regular family meals has a negative correlation with obesity. In a study performed by Chang and Halgunseth looking at parental involvement, family meals and adolescent obesity specifically within the Hispanic population they discovered that, "the combination of high levels of parental behavioral control and high frequency of family meals may protect against weight problems." (Chang & Halgunseth, 2014) They also note that, "Low parental control, on the other hand, may be associated with an unstructured home environment in the Hispanic culture. In a less structured family environment, youth may be less likely to self-regulate their food in-take or eat healthy food." (Chang & Halgunseth, 2014) This was confirmed in a broader study of adolescents by Atkin et al. (2015) In their discussion, they hypothesized the reason for this correlation was because, "adolescents with good family relations or better quality friendships spend more time with their family or friends, and thus report less time in behaviors that may principally be performed alone, such as playing video games, doing

homework or reading." (Atkin et al., 2015). Thus, parents in underprivileged communities are encouraged to focus on cultivating relationships with their children and teens. This is not always possible though since, as discussed, parents in these neighborhoods tend to work long or irregular hours. Despite great parental intention, this physical disconnect can further exacerbate elevated adolescent weight.

Safety within the home is another factor that influences adolescent BMI. A study investigating nearly 6,000 adolescents, half of whom had substantiated CPS claims of abuse or neglect, was conducted to validate this association. Based on the results, it was concluded that, "Overall, obesity prevalence among CPS-investigated children (25%) was higher than among children in the general population (17%) in the National Health and Nutrition Examination Survey (NHANES) data," (Helton & Liechty, 2014) Just like the connection between adolescents who are exposed to chronic stress and elevated weight, abused children are more prone to weight gain and obesity as a response to stress and trauma. They also have elevated cortisol levels and are at higher risk of participating in binge eating as a way to cover the feelings of guilt, shame and fear that abuse, particularly sexual abuse, can substantiate. Parental neglect has similar emotions and outcomes among children and adolescents as well.

Another broad predictor of adolescent obesity is related to education. It begins with the education level of the parents or caregivers. Lack of parental education is directly associated with the problems addressed previously such as the location of neighborhood the child is raised in, access to nutritious food, family income, stressors and safety. The physical location of the home afforded by the family often dictates the school the child goes to as well. Sadly inner city, urban schools are notorious for subpar academia and a more challenging environment. The student's social abilities and experiences in addition to their personal academic abilities influence

food choices and therefore their weight. School experience also plays a sizable role in that child's weight and well-being. Additionally, the resources and offerings such as governmentally assisted feeding programs and the presence or absence of physical education influence a student's health. Ref.

Poverty and poor health can be a vicious cycle, and, unfortunately factors such as parental education level are outside the control of the student, but impact their weight. In a study conducted by the CDC, "Overall, the prevalence of obesity among children and adolescents whose adult head of household had completed college was approximately half that of prevalence among children whose adult head of household did not complete high school." (May, Freedman, Sherry, & Blanck, 2013) In a surprising study by Goodman et al., (2004) it was shown that parental education level is even more significant in predicting adolescent obesity than family income level. They feel that it may be because, "education's effect may relate more to differences in coping styles and other interpersonal skills, such as communication, whereas income's effect may be more strongly associated with material goods and services." (Goodman, Huang & Slap, 2004) Other, less significant reasons may be the type of work and lifestyle the parent has resulting from their education level. Regardless, it appears that lower levels of parental education influence food choices, stress management and physical activity of their children resulting in a higher risk of them becoming obese.

On an individual level, the ability of a student to engage and do well in school predicts their risk of obesity. The success or failure of a child to be 'socially competent' at school, defined as "the set of skills and behaviors necessary for appropriate and positive social interaction," greatly impacts their weight. (Jackson & Cunningham, 2015) This association was documented in a study published by the American Journal of Public Health, and it was

speculated this correlation is due to binge or stress eating and a lack of participation in interactive activities among students who do not engage well socially. They suggest that preteens who struggle with this gravitate toward isolated, sedentary activities such as watching TV, playing video games or reading, over physical activity with their peers. (Jackson & Cunningham, 2015)

Similar isolating behaviors, poor food choices and elevated weight have been seen in adolescents who have lower cognitive abilities and struggle academically in school. This correlation was documented in the International Journal of Obesity. (Liang, Matheson, Kaye, & Boutelle, 2013) Broadly, they found that there is an, "inverse relationship between obesity and academic achievement." (Liang et al., 2013) They go on to deconstruct the data through the compilation of 67 longitudinal research studies and conclude that,

> This review showed that there is stronger and more consistent evidence supporting a relationship between obesity and deficits in the areas of executive functioning (22 out of 30 studies), attention (7 out of 10 studies), visual-spatial skills (2 out of 2 studies), and motor skills (17 out of 20 studies). (Liang et al., 2013)

Within the subset of attention, they also document a strong correlation between ADHD behavior in adolescent males and obesity. (Liang et al., 2013) There is also data to suggest that there are neurological differences in brain signaling among the obese children they observed which might encourage their eating behavior and affect their feelings of satiety. (Liang et al., 2013) Finally, they note that depression also plays a role in both academic function and the perpetuation of obesity among students too. (Liang et al., 2013) Often obese children are bullied or ostracized which, in conjunction with likely other risk factors, sets them up for failure.

Another school-related obesity factor for adolescents can be found in the cafeteria. Dining options for students at school can dictate their health and weight. Schools that provide breakfast programs for children are not always afforded healthy options and they don't always meet the recommended nutrient requirements. This has been an area of scrutiny the past few years and improvements have been made, but there is still room to grow. Highly processed and fattening foods are cheaper staples than fruits and vegetables. In a study done by the Institute of Medicine in 2008 it was reported that,

> Experts examined data on the content of school lunches in the United States, its findings were stark. Children ate strikingly few fruits and vegetables, with little variety. Potatoes accounted for one third of vegetable consumption. Intake of refined grains was high. Almost 80% of children consumed more saturated fat than was recommended, and sodium intake was excessive in all age groups. Children ate more than 500 excess calories from solid fats and added sugars per day. (Baidal, & Taveras, 2014)

This can translate into significant weight gain for students and has contributed to the obesity epidemic in schools. After that study and others were published, the government passed the Healthy, Hunger-Free Kids Act of 2010 (Sjerven, 2014) as an attempt to combat the issue. The problem was that schools complained about the cost and burden this act inflicted so, in an effort to pacify the schools, Congress created waivers and workarounds for stipulations found in the Act. (USDA Food and Nutrition Service, 2015) They are still in effect today. Schools have come a long way in addressing this issue in attempt to quell the adolescent obesity epidemic, but there is still room for improvement. For many low income children, the meals provided by the school are their main source of nutrition. Without well rounded, healthy options the health and weight of those students ~~and teens~~ suffer.

The final aspect examined within the education system in regards to adolescent weight is the presence or absence of PE or other active extracurricular programming. Without these programs or structured activity times, students spend their days performing sedentary activities which contribute to their likelihood of obesity. As advocated for by the US Department of Health and Human Services (2015), it is important that students participate in at least sixty minutes of physical activity a day. Underserved and poor, urban schools often do not have the resources, space or time to provide these offerings to their students. The students from these urban, poor schools are further ostracized due to the inability of most of these families to supplement the lack of in-school exercise with, generally costly, extracurricular or private sports programs. As noted in regard to location, these neighborhoods can also be unsafe or lack the green space to affordably supplement PE. This, as seen before, will increase obesity statistics among the youth of that community.

The final broad area of focus is the impact of the personal and cultural views of a family and neighborhood on adolescent weight. Until they leave home, children and youth are expected to model and participate in the views and culture of those in authority over them. How their guardians and community understand weight, exercise, and health molds the child's view of themselves and their world. The promotion of healthy behavior can have a positive effect on the weight and health of youth, but the converse has an equally strong detrimental effect.

The cultural and family view of weight reflects directly on their child. Stereotypically, certain cultures favor their members to be a certain size or shape which is projected onto the children and teens of that culture. Similarly, family views of weight and how obesity is defined impacts the actions and habits of the child. In a study by Wills and Lawton (2014), parents were interviewed concerning their child's weight, how they viewed it, and if they felt the need to

intervene. Based on their responses she notes, "The views expressed were often grounded in parents' own experiences of weight issues; lay notions of heredity; a lack of knowledge and understanding of physiological changes which might be 'normal' during puberty; and, a desire to protect their teenager's health and emotional wellbeing." (Wills & Lawton, 2014). It was also noted that if parents were overweight or obese themselves, they were much less likely to say anything to their child about it or attempt to intervene. Similarly ~~in an article published in the Sociology of Health and Illness they~~ observed eating habits of adults and adolescents in the context of their surroundings and concluded that, "People's eating patterns form in relation to other people, alongside everyday activities that take place in family groups, work and school. Eating does involve isolated choice, but it is choice conditioned by the context in which it occurs." (Delormier, Frohlich & Potvin, 2009) Therefore, children who grow up in homes with poor eating habits, either by choice or due to lack of resources, tend to continue those patterns and are at much higher risk of obesity as adolescents and adults.

Similarly, the parental view of exercise and its value impacts the activity of their children. Based on a number of systematic reviews, it was shown that parents, particularly in low income demographics, may see the importance of exercise but do not have the time or energy to invest in it. "Many parents cited tiredness as a reason for their lack of motivation and commitment to encouraging their children to exercise and for not preparing 'healthy' meals. Tiredness was perceived to be due to the demands of paid work and childcare." (Pocock, Trivedi, Wills, Bunn & Magnusson, 2010) There were also expressed concerns by the parents in those studies in regards to safety. Parents in the low income neighborhoods often felt that it was unsafe for their children to be outside or walk to school which further discouraged student exercise. (Pocock et al., 2010) This created further discouragement on the part of the parent. There was

also a correlation between parental involvement in the life of their adolescent, not specifically related to exercise, and the teen's behavior regarding their health, diet, exercise and self-esteem. "The results of our study show that parents have a significant influence on adolescent physical activity. Family cohesion, parent-child communication and parental engagement were significant predictors of adolescents meeting recommended MVPA [moderate to vigorous physical activity per week] guidelines one year later;" (Ornelas, Perreira & Ayala, 2007) This relationship, although present among those of all SES can be more difficult to achieve in low income areas when parents work long days or irregular hours, or there is potential instability within the home. Without an emphasis on healthy behavior and relationship, these adolescents are once again at risk for obesity.

A final key influence on an adolescent's weight is the culture they are a part of. People of similar background, race and SES tend to settle in the same neighborhood. With them, they bring their cultural lens in regards to life and health, which frames the views of the community and its children. Often cultures have different views on beauty and weight which they project on those around them. For example, "Studies have documented that larger body size may be more positively viewed in the black community, and that among overweight women, blacks tend to report less body dissatisfaction than whites." (Dorsey, Eberhardt & Ogden, 2012) It has also been documented that, "Overall, misperception was more prevalent among racial/ethnic minorities, men, and men and women with lower education levels. Among the overweight and obese, non-Hispanic blacks and Mexican Americans were more likely to have a weight misperception than non-Hispanic whites" (Dorsey et al., 2012) Classically, inner city neighborhoods are populated with minority groups and low income black families. This sets up

the adolescent for failure once again in regards to their weight with the combination of a food desert and cultural misperception of what an appropriate or healthy weight is.

As seen through extensive research, there is a plethora of factors, particularly targeting urban, poor adolescents, that significantly increases their risk of obesity. These issues are intertwined and set disadvantaged youth up for failure from a health standpoint. These students are subject to living situations that are often unsafe, lack green spaces, do not have access to healthy food, and consciously or subconsciously expose them to high levels of stress. The natural outcome of any number of these factors is an increase in sedentary behaviors, often in front of a television or computer, and poor eating habits. This sadly has a domino effect, leading to serious health conditions that have lasting and deadly consequences. The US government and public health community have been working hard to identify and target risk factors for these students, but there is still much to be done. Transforming culture and closing the gap socioeconomically is daunting, but that should not hinder people from doing their best to affect even a small part of it. As with the classic starfish tale, saving even one child is a step toward a better future.

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[redacted] This is a solid paper with excellent references. You conducted an excellent literature review. Your recognition of the multiple, interactive forces that affect obesity was explained well.

28.5/30

95%

Carmen Rodriguez
PH 755

Stress and Health

We all have felt it at some point of our lives. We experience the pressure that comes with our daily lives' demands and sometimes we feel that we do not posses the necessary resources for coping. When we feel this way we try to find ways to stay clear headed and proceed with our day-to-day activities but not everybody is able to accomplish this. This overwhelming feeling or struggle to maintain our internal environment is called stress.[12] Stress is not completely harmful. Sometimes it is temporary or acute and may not impose any health burden, in the contrary, it might help our immune system.[34] Persistent stress or chronic stress, however, can be a threat to older or unhealthy individuals to the extent that it can serve as a mechanism for serious health issues.[23]

Research on stress and its effect on health are vast and have been carried out for decades. Investigators have found associations between stress and health outcomes, they have created scales to measure stress and have performed many experimental studies including laboratory animal studies to examine this issue. These studies have contributed to the documentation and clarification of differences among social groups in stress exposure, health, and well being.[3] The majority of the literature indicates that differences in health begin early in life and accumulate over the years.[4] This public health brief provides an overview of some of the available information on stress and health outcomes. Also, it looks at how exposure to stress is unequally distributed in the general population, that is, we will look at the role stress plays in health inequality.

STRESS AND HEALTH OUTCOMES

Being exposed to stress and stressful environments account for different physical and mental health outcomes and these have been examined in several studies:

- Observational and experimental studies have found an association between stress and cardiovascular disease.[56] Using stress as the exposure variable, studies have found as outcome increases in blood pressure, changes in cardiac rhythm and changes in the viscosity of the participant's blood.[5]
- Among men and women, work stress was reported to be a predictor of incident coronary heart disease (CHD) and hypertension.[16] For women, however, it was found that marital stress was a better predictor than work stress for CHD outcomes.[1]

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- There are different types of stress exposure and one that has been studied is discrimination stress. Discrimination refers to being treated unfair by others because of one's race, gender, social class or sexual orientation.[3] In a systematic review, investigators found a significant association between perceived discrimination and cardiovascular disease risk factors.[5] In general, it was found that discrimination stress is associated with self- reported poor health, chronic health conditions, depression among other health issues.
- Men with HIV were followed in a 7.5 years study and investigators found an association between stressful life events and faster progression to AIDS.[1]
- Studies have found that using more comprehensive stress measures such as work-family conflict, troubled relationships, and living in a dangerous area, etc., can explain 25 to 40 percent of the variability in psychological distress and depressive symptoms.[3]

HEALTH INEQUALITY AND STRESS

Stress is not experienced equally in the population. Some people are more exposed to stressful life events and this exposure varies by social status, race- ethnicity and gender.[3] Studies have found an inverse association between stress and social status, that is, the higher the social status the lower the exposure to stress.[3] Also, this unequal distribution of stress among different social groups seems to account for the higher rates of morbidity, disability and mortality observed in lower socioeconomic status groups.[3]

In the decades of stress research a lot has been found including how stress plays a role in health inequality and these results have been consistent. It was found that females, young adults, racially minority groups, divorced/ widowed, and poor and working class people deal, significantly, with more chronic stress and have more accumulated stressors in their lives as compared to the opposite groups.[3] This unequal distribution of stress is what many studies have found accounts for health disparities among these groups. Finally, a very important concept stress that has been explained is its proliferation over time and how this widens the gap between different social groups.[3] Stress proliferation means that one stressor can give rise to others, which in turn may cause more health damages than the initial one. It was found that this proliferation of stress piles up over the life course of individuals and this increases disparities in wealth, health and longevity.[3]

CONCLUSION

As mentioned, stress has been widely studied in different disciplines. Many studies have looked at the physiological mechanisms of "how stress gets under skin". Other studies have looked at behavioral mechanisms of stress while others study stress as psychosocial factor. These researches have provided us with hard data of the effects of stress on health outcomes, however, there seems to be a lot left to be done but it is believed that research being done in areas such as molecular biology, cognitive-emotional psychology, medicine, and clinical psychology may contribute greatly to the quantification of the effect long term stress has on health.

Now, what can be done to reduce the risk of stress among those that seem to be more affected at a social or individual level? It has been proven that having social support, strong coping strategies and high self-esteem may help reduce the effect of stress on health.[13] Also, in one study it was found that increasing positive effect, feelings like happiness and joy, might protect against cardiovascular risks.[4] Thus, when people feel intense stress it is recommended to increase their positive effect by finding enjoyable and relaxing hobbies or activities. Though, this may not work for everyone since we all deal with stress differently depending on our social group, race-ethnicity or gender. This is why intervention programs are needed. Aside from seeing a psychologist to try to find the roots of the problem, people should seek help from stress management programs such as psychosocial interventions. These programs focus on "decreasing perceived stress and negative mood, improve perceived social support and also provides patients with problem-focused coping strategies".[1] These kinds of interventions have proven to be beneficial, however, there are also things people can do as individuals to reduce their of stress. For example, people should avoid substance abuse and alcohol consumption as a way out of a difficult situation because then, all these behavioral factors will also play a role in increasing people's risk for disease.

Public Health Brief:

How location of Injection affects the health of PWID

Sarah Deutsch, September 2015

Background

Injection drug use is a risk factor for a variety of undesirable health outcomes, including the transmission of blood-borne disease such as HIV and hepatitis C (1). Several public health measures have been designed and popularized internationally to reduce the incidence of equipment sharing as a means to prevent further spread of infection. The most widespread example of this approach, often referred to as harm reduction, has been the implementation of syringe exchange programs (SEPs) in many countries. Yet, while great strides in access to equipment have been achieved, many urban areas continue to face ongoing barriers to prevention and care. These challenges are often associated with the impact of criminalizing drug use, including fear of arrest and incarceration for possession and/or use of drug paraphernalia and/or controlled substances. Some of the direct impacts of criminalization can be seen in the lack of regulation of substances, which impacts purity and increases the potential for overdose. Stigma can lead to injection drug users hiding their drug use and injecting in places that are unsafe or unhygienic. In turn, since 2000 New York City has seen an unprecedented rise in overdose (2), injection related injuries such as abscess or other vascular disease, and improper disposal of used injection equipment.

Impact

- In New York City, rates of opioid overdose increased by 256% between 2000 and 2013 despite a corresponding increase in the availability of the opioid antagonist naloxone, a vital tool in the reversal of opioid overdose (2).
- A whopping 53% of harm reduction participants who inject drugs reported having had a positive HCV test result at some point; only 12% reported having engaged in treatment (3).

A Logical Leap

Little research has been conducted on the local level to define the exact role of injection location in overdose deaths in New York City. Yet, there is one factor that affects the probability of fatality in both public and private locations: supervision. A person who overdoses is much more likely to die from the overdose if she or he is alone when the drug is consumed (4). How can we as a community address this established risk factor on a public health level?

Case Studies

Sydney, New South Wales, Australia

A 2001 cross-sectional study of 200 IDUs indicated that a majority of fatal overdoses were occurring in public places (4) and also reported that the more often injectors reported public injection, the more likely they were to experience associated harms such as scarring and abscess in addition to unstable housing.

Downtown East Side, Vancouver, Canada

Some of the reported positive impacts of Vancouver's Safer Injection Facility (SIF) include rapid crisis response, being able to take one's time, improved delivery of risk reduction education, and a lessening in reported fears related to injecting substances of unknown potency (5). Each of these safety measures plays a part in reducing the rate of overdose in the surrounding area.

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What is a Safer Injection Facility?

The International Drug Policy Consortium defines a Drug Consumption Room (DCR) or Medically Supervised Injection Site (MSIS) as a formal setting for IDUs to self-inject using pre-obtained drugs in a sterile environment – all while under the supervision of trained medical staff (6). Currently, there are 98 SIFs in 66 cities in ten countries around the globe, each of which plays an important role in protecting the life and wellbeing of urban drug users (6). While utilizing a SIF, injection drug users are made to feel safe, which helps individuals avoid rushing the injection process and thus reduce the risk of injury. In addition, SIFs are well-lit in order to ensure accuracy and prevention of vein collapse. Lastly, and perhaps most importantly, those who utilize the SIF do not run the risk of arrest or incarceration (6).

Current Events

In January 2014 in New York City, the Injection Drug Users Health Alliance (IDUHA) began a multi-phase cross-sectional study in order to assess the longitudinal health status of drug users across the five boroughs. The survey tool was developed to measure utilization of services in addition to outcomes of service utilization. In spite of the vast array of services offered and taken advantage of, a gap was identified; more than 60% of injectors reported recent injection in public spaces (3). Simultaneously, Bronx-based SEP BOOM!Health conducted a survey with local businesses about bathroom utilization, and almost half of all businesses with public bathrooms reported having had customer complaints about drug use in their bathrooms (3). As a result, and in alliance with VOCAL-NY, Drug Policy Alliance, and Open Society Foundations, IDUHA has launched a campaign to raise awareness about public drug use and its implications.

Next Steps

Community involvement is key! The campaign for SIFs in New York City is being launched tomorrow, September 30th, and the voices of key stakeholders must be heard. It is recommended that all those impacted by public drug use contribute to the cause by attending this forum to ensure policy reflects community need. In the meantime, SEPs can contribute to the health and wellbeing of their program participants by improving access to a clean, well-lit bathroom with sharps containers that are regularly maintained. The need for a monitored injection location is no longer a secret, and must be addressed.

Sources

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The Outside Influence: Neighborhoods and The Built Environment As Exterior Health Determinants

PHE 702: Environmental Health

December 1, 2011

ABSTRACT:
This study addressed the idea that neighborhood and built environment are essential established determinants of health. These determinants must be adequately considered during urban planning and design in order to enhance wellness and minimize environmental injustices. Similarly, when comparing neighborhoods, discrepancies in overall socioeconomic status (SES), irrespective of individual SES, have positively correlated with observed heath inequities. Specifically, this study examined nine blocks located in the Southeast Bronx including thirty-nine corresponding audit points. Nineteen features of the urban neighborhood of interest were converted into measurable variables and subsequently investigated. Data concerning each of the variables were gathered for all points using an objective audit form. Results were compiled and spatial distribution of certain attributes was displayed using Geographical Information Systems (GIS) software. Analysis of results revealed a primarily quiet, safe residential area surrounding a major medical education institution. In order to better the health of this population, adequate utilization of public open space for recreation purposes was recommended. Sidewalk conditions, possibly serving as physical obstructions to pedestrians, needed to be improved to ensure safety of vulnerable individuals such as the elderly. Additionally, in attempt to reduce litter and pollution, the need for more garbage disposal sites was noted. An emphasis was placed on the importance of the built environment as a health determinant.

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BACKGROUND:

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When addressing population health, socioeconomic status and behavior are among the commonly highlighted health determinants. However, upon broadening the focus, external features such as neighborhood and the built environment emerge presenting critical implications for public health (Diez Roux & Mair, 2010). This can be seen dating back to the Industrial Revolution when spatial contexts played an important role in facilitating the spread of infectious disease through overcrowded, unsanitary living quarters. The effects continue today as the physical environment influences exposures and lifestyle, which contribute to chronic degenerative disease (Perdue, Stone & Gostin, 2003). Additionally, neighborhood and the built environment have been shown to mold social networks and dictate the prevailing socioeconomic characteristics (Cagney & Cornwell, 2010; Galea et al, 2007; Holton, 2004). Moreover, because social environment and socioeconomic status are demonstrated indicators of health outcomes, neighborhood and health are inextricably linked (Matthew & Yang, 2010). Carefully dissecting the relationship between the external environment and wellness is crucial for the success of public health.

It becomes specifically important in urban areas that are often designed without considering or acknowledging potential health consequences (Perdue, Stone & Gostin, 2003). The collective incorporation of public health and urban planning is necessary as city residents experience unparalleled physical and social stressors such as noise, traffic, pollution, crime, work and relationships (Northridge, Sclar & Biswas, 2003; Fan, Das & Chen, 2011). Because features of the built environment are capable of potentiating positive or negative health outcomes, they must be considered in order to optimize well-being. Green space, for example, providing public recreation in urban neighborhoods, has been shown to foster social networks and increase the physical activity of residents. Furthermore, increased physical activity and efficient access to recreational resources have been associated with lower BMI, and consequent decreased risk of obesity, diabetes and hypertension (Diez Roux & Mair, 2010). Conversely, lack of green space has been related to increased violence and absence of community (Perdue, Stone & Gostin, 2003). This is of profound importance when concerning elderly populations, as their health strongly relies on recreational access, social cohesion, and perceived level of safety (Cagney & Cornwell, 2010).

Interestingly, more intricate relationships are revealed and the idea of environmental justice becomes important when neighborhood socioeconomic status is incorporated into health outcome. The built environment ultimately delineates the overall socioeconomic status (SES) of a given area. Consequently, certain chronic degenerative diseases are more prevalent in neighborhoods of low SES. Therefore, environmental justice, described as the right of all individuals regardless of personal characteristics such as race, ethnicity or economic status to equal quality of environment, becomes jeopardized. When adjusting for individual SES and other prospective confounding variables, major depression incidence and asthma hospitalization rates have been shown to be significantly higher in urban neighborhoods of lower SES. Mental health impairment may be attributed to social disorganization and asthma prevalence is thought to rise due to increased pollutant and toxin exposure in these geographic locations (Galea et al, 2007; Maantay, 2007).

Commented [ARM4]: Not sure I agree with this completely

The latter study, demonstrating elevated asthma hospitalization rates, was explicit to the Bronx. Alarmingly, individuals living near toxic release sites were 66 percent more likely to be hospitalized for asthma complications. Further, residents living in these respective areas were 31 percent more like[ly] to live below the federal poverty limit (Maantay, 2007). Although this was one particular study, the Bronx serves as an attractive region for supplemental spatial analysis. Containing a population of nearly 1.4 million people, it is the not only the poorest of the five New York City boroughs, but also remains the most indigent urban county in the United States (U.S. Census, 2010). The Bronx is demographically unique, containing a population comprised of 89.1% minorities. In addition, the comprehensive education level is unsatisfactory with 31.3% of individuals not obtaining their high school diploma. Socioeconomic status is revealed by statistics such as these, however, the built environment and neighborhood must be examined through objective observation. The major goal of this study was to characterize the physical aspects of a discrete neighborhood in the Bronx by completing an objective environmental audit. Spatial analysis of the findings was subsequently conducted using Geographical Information Systems (GIS) software.

METHODS:

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Defining the area of study:

The study area was defined based on an interest in observing the neighborhood and built environment surrounding academic medical institutions in the Bronx. Hence, nine blocks, in the Southeast region of the borough, were chosen surrounding Montefiore and Albert Einstein College of Medicine (Figure 1). In order to ensure an exhaustive spatial analysis of the neighborhood, thirty-nine block faces exteriorly bounded by major nearby roads (Eastchester Road, Morris Park Ave and Williamsbridge Road) were included. As a result of physical barriers, only one block to the east of campus was observed, strongly favoring blocks to the west.



Figure 1: Audit map with block faces indicated

Data Collection:

After delineating the study area, nineteen physical and social environmental characteristics were specified and successively converted into measurable variables. Each of the neighborhood traits became either a categorical or ordinal variable. Thirteen of the nineteen features (residential presence, commercial presence, industrial presence, recreational presence, liquor availability, fast food presence, police presence, loitering, homeless presence, educational institutions, faith based organizations, hospital/emergency care, open space/lawn/gardens) translated into categorical variables with simple yes or no responses pertaining to the presence or absence of a given attribute (ex. residential presence: yes or no). The remaining six characteristics (traffic volume, sidewalk condition, residential condition, commercial condition, noise level, litter level) involved volume level or condition of a particular aspect and therefore became quantifiable ordinal variables. Assigned values for such variables were either low/medium/high or poor/fair/good, respectively (ex. traffic volume: low, medium, high; sidewalk condition: poor, fair, good). All nineteen characteristics were then inputted into the objective audit

form (Figure 3). Additionally, the streets corresponding to each audit point as well as their two cross streets were recorded.



Image 1: good and poor sidewalk conditions observed audit point 35 and 19 (left to right)

The neighborhood audit was conducted on an overcast Wednesday morning in mid-October between 9:00AM and 11:30AM. The ambient air temperature was 54º F. Data for all nineteen variables were gathered beginning at audit point 1 and continuing until completion with audit point 39. Each block face represented only one side of the street. The six categorical variables were assigned yes or no values based on whether the specific trait was present or absent. The ordinal variables were ranked relative to the entire neighborhood. Traffic volume was assigned a value of low, medium or high based on the number of cars observed within a thirty second period (low: 0 to 5 cars, medium: 6 to 10 cars, high: more than 10 cars). Similarly, litter level was determined according to the amount of garbage present along the block face (low: 0 to 5 pieces of trash, medium: 6 to 10, high: more than 10). Noise level was ranked low if the audit point was quiet, medium if there was average noise and high if it was loud. Typically, values of high were assigned to busy, congested streets where sirens and ambulance were heard. Sidewalk, residential and commercial conditions were evaluated as poor, fair or good. Values were distributed as follows: poor if the structure was noticeably deteriorating, fair if the structure was in decent condition, and good if the structure was well-manicured and in above average shape. (See Image 1 for example of poor and good sidewalk conditions). In conjunction with the objective audit, a "features of interest list" was recorded to gather unique information not accounted for in the objective audit from particular block faces (Figure 2). Documented observations included, but were not limited to sirens, alarms, signs and construction sites (Image 2 & 3).

Features of Interest List

Audit Point (ID)	Street (name)	XStreet1 (name)	XStreet2 (name)	Features of Interest (observation)
4	Pierce Ave	Hering Ave	Tenbroeck Ave	Ambulance siren is heard
5	Hering Ave	Van Nest Ave	Pierce Ave	Loud music, noisy children playing outside
6	Van Nest Ave	Yates Ave	Hering Ave	No littering sign, yet no garbage cans present, noticeable smell of garbage, beautiful home bordered by wooden fence, remainder of street bordered by metal and concrete baracade.
7	Yates Ave	Van Nest Ave	Pierce Ave	barking dog, presence of halloween spirit
8	Pierce Ave	Hering Ave	Yates Ave	No trespassing sign
9	Yates Ave	Van Nest Ave	Pierce Ave	Uncollected bags of garbage outside home
11	Williamsbridge Rd	Van Nest Ave	Pierce Ave	Two beautful adjacent homes are for sale. Homes are surrounded by run down properties
19	Hering Ave	Pierce Ave	Sackett Ave	Car alarm sounds
22	Morris Park Ave	Tenbroeck Ave	Hering Ave	Closed down commercial space
24	Van Nest Ave	Hering Ave	Tenbroeck Ave	Ambulance siren is heard
26	Morris Park Ave	Newport Ave	Tenbroeck Ave	Bus stop, pay phone, garbage can
29	Newport Ave	Morris Park Ave	Van Nest Ave	Horrible smell, waste collection site; animal feces and remains from the Animal Institute at Einstein deposited in a dumpster at this audit point.
33	Sackett Ave	Eastchester Rd	Tenbroeck Ave	Construction work at hospital
35	Morris Park Ave	Eastchester Rd	Newport Ave	Bus stop, well-maintained crosswalks, many students present
37	Loomis St	Eastchester Rd	Bassett Ave	Employment service center, people waiting outside
38	Bassett Ave	Loomis St	Morris Park Ave	Graffitti all over the street
39	Morris Park Ave	Eastchester Rd	Bassett Ave	Double parked cars, sirens are heard

Figure 2: Features of Interest List- additional observations noted at particular audit points

Data Analysis:

After the data was collected, results were compiled from the original audit form

using Microsoft Excel for all nineteen variables. Percentages or frequencies were calculated for each of the possible values assigned to a given attribute. Pie charts and bar graphs were subsequently assembled for traffic volume, sidewalk condition, noise level and litter level (Figures 4, 5 & 6). Residential presence and condition and commercial presence and condition were represented together as a pie of pie chart and bar of pie chart, respectively (Figure 7 & 8). Additional categorical variables were displayed in a table with calculated percentages indicated (Figure 9). GIS software was implemented to construct four maps outlining the spatial distribution of four separate critical neighborhood variables: sidewalk conditions, traffic volume, noise level, and open space/lawn/garden presence (Figure 10).



Image 2: Construction site noted at audit point 18 and recorded in features of interest list

Limitations:

Based on design and data collection, there are potential limitations to the study methods implemented. As previously mentioned, due to physical obstructions, the neighborhood of interest was predominately located to the west of campus, possibly missing observations that may have been unique to the east side. Although the study was designed to be objective, possible biases may have influenced values assigned at particular audit points. Attributes of interest were transferred to measurable variables in attempt to minimize this concern. However, I the auditor, may have had preconceived opinions and views based on prior familiarity with the neighborhood, which could have impacted the final audit. Further, the study covered an expansive area in the Southeast Bronx and required two and half hours to complete. Because it was conducted on a weekday morning between 9:00 and 11:30 AM, differences in certain variables between block faces such as noise, traffic and loitering may have been attributed to the time the measures were taken rather than the audit points themselves. Higher values may have been recorded in the beginning of the audit due to rush hour traffic, whereas data collected at the end of the audit (11:30 AM) may have been weaker as people entered the middle of their workday. The study was conducted during one morning and therefore, the measures only reflect a small piece of the total environment. For example, the neighborhood could have an entirely different data set if examined at night. The overcast weather may have also affected the results as lack of sunlight could have psychologically altered perception of the neighborhood. Lastly, if the dreary weather caused more people than average to remain indoors certain values, such as noise level, traffic volume and loitering, may have been underestimated.



Image 3: Sign noted at audit point 7 and recorded in features of interest list

Figure 3: Original objective audit form with observed data

Audit Point	Street	XStreet1	XStreet2	Traffic Volume	Residential Condition	Residential Presence	Residential Condition	Commercial Presence	Commercial Condition	Industrial Presence	Recreation Presence	Open Availability	Park Area Presence	Noise Level	Litter Level	Loitering	Business Presence	Institutional Institutions	Park Name org	Hospital/Urgent/HCo Care	Open Space/Lawns/Gardens	Police/Law Enforcement Presence
(ID)	(name)	(name)	(name)	(low, med, high)	(poor, fair, good)	(y/n)	(poor, fair, good)	(y/n)	(poor, fair, good)	(y/n)	(y/n)	(y/n)	(y/n)	(low, medium, high)	(low, medium, high)	(y/n)	(y/n)	(y/n)	(y/n)	(y/n)	(y/n)	(y/n)
1	Hering Ave	Van Nest Ave	Pierce Ave	low	fair	y	fair	n		n	n	n	n	medium	medium	y	n	n	n	n	y	n
2	Pierce Ave	Hering Ave	Tenbroeck Ave	low	fair	y	fair	n		n	n	n	n	medium	medium	n	n	n	n	n	y	n
3	Tenbroeck Ave	Van Nest Ave	Pierce Ave	medium	fair	y	fair	n		n	n	n	n	medium	medium	n	n	n	n	n	y	n
4	Pierce Ave	Hering Ave	Tenbroeck Ave	low	fair	y	fair	n		n	n	n	n	medium	medium	n	n	n	n	n	y	n
5	Hering Ave	Van Nest Ave	Pierce Ave	low	fair	y	fair	n		n	n	n	n	medium	medium	y	n	n	n	n	y	n
6	Van Nest Ave	Yates Ave	Hering Ave	low	poor	y	good	n		n	n	n	n	low	low	n	n	n	n	n	y	n
7	Yates Ave	Van Nest Ave	Pierce Ave	low	fair	y	fair	n		n	n	n	n	low	medium	n	n	n	n	n	y	n
8	Pierce Ave	Hering Ave	Yates Ave	low	fair	y	fair	n		n	n	n	n	low	medium	n	n	n	n	n	y	n
9	Yates Ave	Van Nest Ave	Pierce Ave	low	poor	y	fair	n		n	n	n	n	low	medium	n	n	n	n	n	y	n
10	Van Nest Ave	Williamsbridge Rd	Yates Ave	low	fair	y	good	n		n	n	n	n	medium	low	n	n	n	n	n	y	n
11	Williamsbridge Rd	Van Nest Ave	Pierce Ave	high	fair	y	fair	y	fair	n	n	n	n	medium	medium	y	n	y	n	n	y	n
12	Pierce Ave	Williamsbridge Rd	Yates Ave	medium	fair	y	fair	n		n	n	n	n	medium	medium	n	n	n	n	n	y	n
13	Hering Ave	Pierce Ave	Sackett Ave	low	poor	y	fair	n		n	n	y	n	low	low	n	n	n	n	n	y	n
14	Pierce Ave	Hering Ave	Yates Ave	low	fair	y	fair	n		n	n	n	n	low	medium	n	n	n	n	n	y	n
15	Yates Ave	Pierce Ave	Sackett Ave	low	good	y	fair	n		n	n	n	n	low	low	n	n	n	n	n	y	n
16	Sackett Ave	Yates Ave	Hering Ave	low	poor	y	fair	n		n	n	n	n	low	medium	n	n	n	n	n	n	n
17	Tenbroeck Ave	Pierce Ave	Sackett Ave	low	good	n		n		y	n	n	n	low	low	n	n	n	n	n	n	n
18	Pierce Ave	Hering Ave	Tenbroeck Ave	low	poor	y	fair	n		n	n	n	n	low	medium	n	n	n	n	n	y	n
19	Hering Ave	Pierce Ave	Sackett Ave	low	poor	y	fair	n		n	n	n	n	low	medium	n	n	n	n	n	y	n
20	Sackett Ave	Hering Ave	Tenbroeck Ave	medium	poor	n		n		y	n	n	y	low	medium	n	n	n	n	n	n	n
21	Tenbroeck Ave	Sackett Ave	Pierce Ave	low	fair	n	fair	n		y	n	n	y	low	medium	n	n	n	n	n	n	n
22	Morris Park Ave	Tenbroeck Ave	Hering Ave	high	fair	y		n	fair	n	n	n	n	medium	low	n	n	n	n	n	y	n
23	Hering Ave	Morris Park Ave	Van Nest Ave	low	poor	y	fair	n		n	n	n	n	low	low	y	n	n	n	n	y	n
24	Van Nest Ave	Hering Ave	Tenbroeck Ave	low	fair	n	fair	n		n	n	n	n	medium	medium	n	n	n	n	n	y	n
25	Newport Ave	Morris Park Ave	Van Nest Ave	low	fair	n		n		n	n	n	n	low	low	n	n	n	n	n	n	n
26	Morris Park Ave	Newport Ave	Tenbroeck Ave	high	fair	n		n	fair	n	n	n	y	medium	high	n	n	n	n	n	n	n
27	Tenbroeck Ave	Morris Park Ave	Van Nest Ave	low	fair	y	good	n		n	n	n	n	low	medium	n	n	n	n	n	y	n
28	Van Nest Ave	Tenbroeck Ave	Newport Ave	low	poor	y	fair	n		n	n	n	n	low	medium	n	n	n	n	n	y	n
29	Newport Ave	Morris Park Ave	Van Nest Ave	low	fair	n		n		n	n	n	n	low	low	n	n	y	n	n	y	n
30	Van Nest Ave	Tenbroeck Ave	Newport Ave	low	fair	n		n		n	n	n	n	low	low	n	n	y	n	n	n	n
31	Tenbroeck Ave	Van Nest Ave	Pierce Ave	medium	good	n		n		n	n	n	n	medium	low	n	n	y	n	n	y	n
32	Tenbroeck Ave	Pierce Ave	Sackett Ave	low	good	n		n		n	n	n	n	low	low	n	n	y	n	n	y	n
33	Sackett Ave	Lorchester Rd	Tenbroeck Ave	low	fair	n		n		n	n	n	n	medium	medium	n	n	y	n	n	n	n
34	Lorchester Rd	Loomis St	Morris Park Ave	medium	fair	n		n		n	n	n	n	medium	low	n	n	y	n	n	n	n
35	Morris Park Ave	Lorchester Rd	Newport Ave	high	good	n		n		n	n	n	n	medium	low	n	n	y	n	n	y	n
36	Lorchester Rd	Loomis St	Morris Park Ave	high	fair	n		y	fair	n	n	n	n	medium	medium	n	n	y	n	n	n	n
37	Loomis St	Lorchester Rd	Bassett Ave	low	fair	n		y	fair	n	n	n	n	low	low	y	n	n	n	n	n	n
38	Bassett Ave	Loomis St	Morris Park Ave	low	poor	n		y		n	n	n	n	low	low	n	n	n	n	n	n	n
39	Morris Park Ave	Lorchester Rd	Bassett Ave	low	good	n		y	fair	n	n	n	n	medium	low	n	n	n	n	n	n	n

RESULTS:

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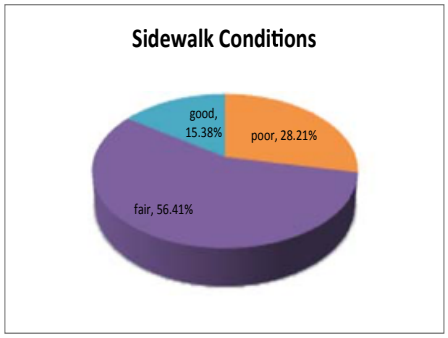

Figure 4: Pie chart representing distribution of neighborhood sidewalk conditions

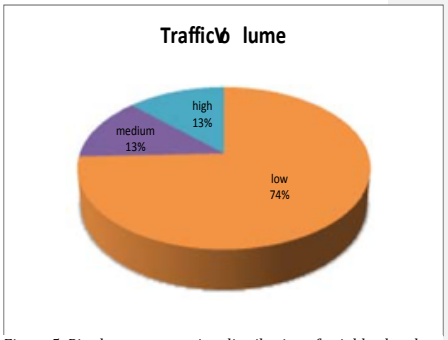

Figure 5: Pie chart representing distribution of neighborhood traffic volume

Percentages of sidewalk conditions and traffic volume are graphically displayed in Figures 4 and 5. The majority of sidewalks (56.4%) were in fair condition. However, there were a higher percentage of sidewalks in poor condition (28.2%) than in good condition (15.4%). Overall, traffic volume in the neighborhood was low (74.0%) with less than 5 cars passing every thirty seconds.

Noise level and litter level were also low (Figure 6 & 7). Of the 39 block faces observed, 24 (61.5%) had low noise volume and 0 had high noise volume. The litter level was only high (10 or more pieces of trash) at 2 points (5.1% %). It was reported as low levels at nearly half of block faces (19 of 39 or 48.7%).

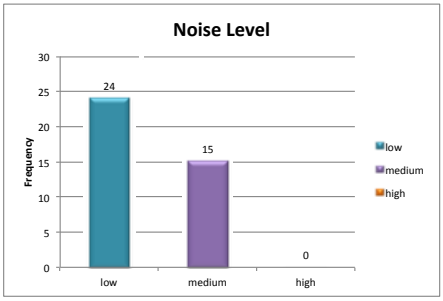

Figure 6: Bar graph depicting frequencies of neighborhood noise levels

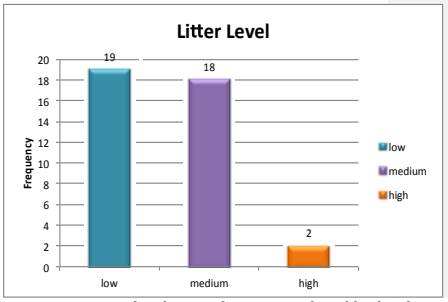

Figure 7: Bar graph indicating frequencies of neighborhood litter levels

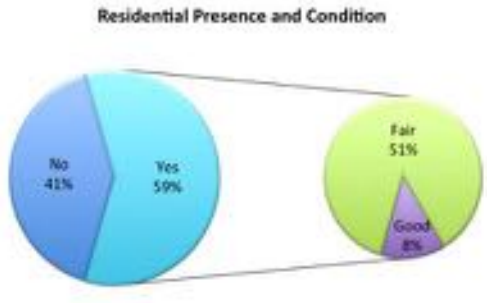

Figure 8: Pie of pie chart representing residential presence and condition

The neighborhood was also shown to be predominantly residential with a residential presence noted at 59% (23/39) of audit points. More specifically, the general condition of residences was fair (20 out of 23) and only 3 (13.0% of residences or 8% of total points observed) were considered

to be in good condition (Figure 8). There was a small commercial presence (15% or 6/39), all shown to be in fair condition (Figure 9).

Figure 10 can be referenced for the additional categorical variables observed. Interestingly, the neighborhood was void of recreation, police/law enforcement and homelessness. Educational institutions and hospitals/emergency care were each observed at approximately 18.0% of audit points. The industrial presence was minor (7.7%) and liquor availability and faith-based organizations were even less commonly noted (2.56% for both). Loitering was detected at 10.3% of block faces and 56.4% of audit points contained open space/lawns/gardens.

GIS software was employed to construct Figure 11. Here, the spatial distribution of sidewalk conditions, traffic volume, noise level and open space/garden/lawn presence are displayed.

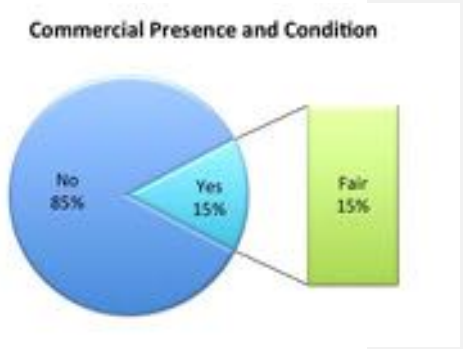

Figure 9: Bar of pie chart representing commercial presence and condition

Additonal Variables of Interest

	Yes (%)	No (%)
Industrial Presence	7.69%	92.31%
Recreation Presence	0.00%	100.00%
Liquor Availability	2.56%	89.74%
Fast Food Presence	5.13%	87.18%
Loitering	10.26%	89.74%
Homeless Presence	0.00%	100.00%
Educational Institution Presence	17.95%	82.05%
Faith Based Organization Presence	2.56%	97.44%
Hospital/Medical Care Presence	17.95%	82.05%
Open Space/Lawns/Garden Presence	56.41%	41.03%
Police/Law Enforcement Presence	0.00%	100.00%

Figure 10: Categorical variables represented as percentages

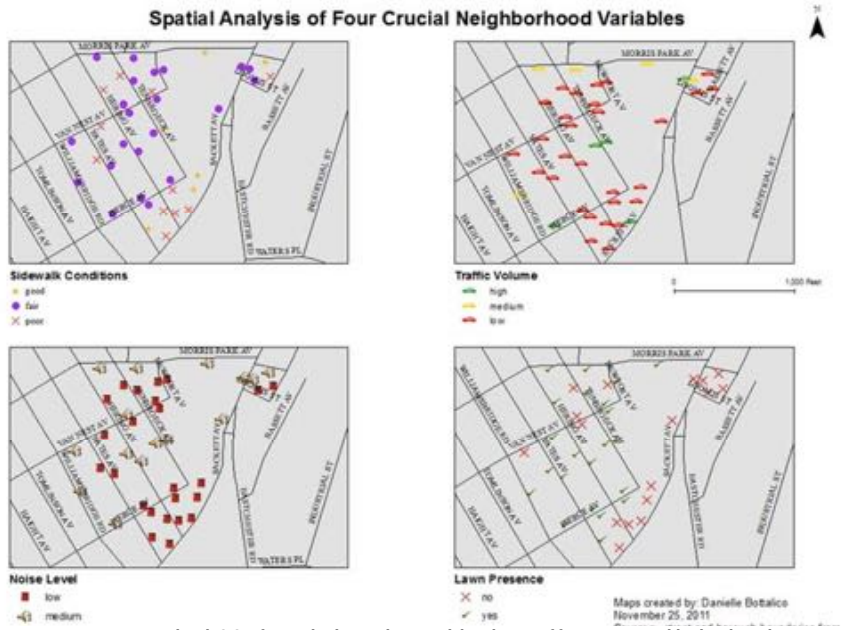

Figure 11: Four maps created with GIS software displaying the spatial distribution of four unique neighborhood attributes

DISCUSSION:

Collaboration of personal observations, the objective enviornmental audit, and resulting data have provided substantial information regarding the study area of interest. After visually surverying the neighborhood encompassing Albert Einstein College of Medicine and Montefiore campus, it appeared to be a relatively quiet residential region with older homes lining the majority of block faces. Open space and lawns were quite prevalent in comparison to other observed urban neighborhoods. The built environment certainly did not seem to be dominated by commercial stores and industrial business. Aside from places of residence, hospitals and educational centers were frequently noticed. For a Bronx neighborhood, the atmosphere seemed safe and traffic appeared to be rather mild.

Intial thoughts regarding appearance proved to be satisfactory as collected data agreed with preliminary observations. Noise level, litter level and loitering variables all confirmed the apparent calmness of the environment. Noise levels were never reported to be high and over 60% of audit points were assigned low noise values. Litter levels were only high at 2 audit points and over 48% of block faces had low litter levels. Further, 74% of the neighborhood had low traffic volume. Generally reported low values of traffic, noise and litter levels could potentially suggest an uncongested, serene environment. Commerical presence was only found at 15% of audit points and industrial presence was even more scarce noted at 7.7% of block faces. Contrarily, both educational presence and hospital/medical care presence were observed at nearly 18% of study points. Further validating the apparent neighborhood characteristics were the low levels of loitering (10.3%) and the lack of police/law enforcement throughout the entire neighborhood. While the lack of presence of this latter attribute could be interpreted as a positive or a negative depending on how police presence is perceived, because of the nature of this study neighborhood, the absence could be attributed to low demand.

Commented [ARM7]: Nice maps… just be careful not to mislead your readers. The traffic map, for instance, may be easily misinterpreted to think that the red cars represent the high volume traffic since red is often associated with "trouble".

Commented [ARM8]: Excellent discussion/conclusion/findings/etc . section

According to the community health profile for the Southeast Bronx provided by the NYC Department of Health and Mental Hygeine, the statistics in this region are better than the Bronx as a whole. The small neighborhood of study is only a minor area of the entire Southeast Bronx for which the data was provided. However, when combining these statistics with the study's findings, plausible generalizations can be drawn. The Southeast Bronx has a lower poverty rate when compared to the entire borough (22% vs 31%). Similarly, data from this small study showed a 0% homelessness rate with overall fair residential and commercial conditions. 8% of residences were even reported to be in above-average condition. The attained educational level in this sector was better as well with 30% of individuals receiving a high school diploma compared to 26% of the entire Bronx borough. Perhaps, the strong prevalence of educational institutions noted in the audit contributes to this improvement. Altogether, mental health and substance abuse were also better with only 6% of individuals reporting chronic illness such as major depressive disorder and lower than average alcohol and drug related hospitalizations. Accordingly, the study area of interest reported extremely low liquor availability, with stores selling alcohol only present in 2.6% of the neighborhood. Likewise, social disorganization, which can result from lack of green space, has been shown to impair mental health (Fan, Das & Chen, 2011; Galea et al, 2007). Of the 39 block faces studied, 56.4% contained open space/lawns/garden presence, perhaps instrumenting enhanced mental health.

While many strengths were noted, certain features of the built environment needed improvement.
As stated in the community health profile, 24% of individuals living in the Southeast Bronx are obese, 1 in 10 have diabetes and 45% of residents report sedentary lifestyles, receiving no exercise at all. Therefore, there is a consequent higher than average incidence of heart disease. Analogously, the built environment studied documented no recreational presence. Prevalence of green space, as indicated by the high percentage of open space/lawns/ gardens is beneficial; however, it appears to be more advantageous when used as a recreational resource (Fan, Das & Chen, 2011). Increased physical activity, which is known to decrease BMI, incidence of obesity, hypertension and diabetes, has been correlated with use of public space for recreational purposes (Diez Roux & Mair, 2010). Therefore, a need for more recreation is crucial to health of this population. The fast food presence (5.1%) was relatively low and did not appear to contribute to these health concerns. However, while not directly measured, access to healthy foods appeared limited.



Image 4: Ineffective sign depicted by nearby litter (Audit Point 6)

Furthermore, higher than average asthma rates, as reported by the NYC Department of Mental Health and Hygiene, also presented a concern. As reported by Maantay (2007), pollutant and toxin exposure have been shown to exacerbate asthma prevalence. While litter levels were generally low, 51.3% of audit points had values of medium or high. Signs warning against pollution, threatening violators with fines, appeared to be ignored (See Image 4). Only 1 of 39 block faces had a garbage can (Figure 2: Audit point 26) and no recycle bins were noted. Moreover, audit point 29 seemed to be a serious pollution hazard. This area served as a waste collection site of animal feces and remains from the Animal Institute at Einstein. The rancid smell was not well-contained and clearly polluted the air (Image 5). The collaboration of these issues could ultimately lead to the documented increased asthma rates.

Demographically speaking, the community health profile reported an older population, with 43% of individuals 45 years of age or older. Moreover, 12% were observed to be 65 years or older. Elderly residents are a known vulnerable population affected by physical stressors responsible for altering perceived level of safety, such as graffiti and sidewalk conditions (Cagney & Cornwell, 2010). The former attribute was not included within the objective audit, but was noticed upon surveying the area (Figure 2, Image 6). Sidewalk conditions were generally reported as fair (56.4%). Yet, a significant portion of audit points were graded poor (28.2%), indicating the need for improvement.



Image 5: Potential source of air pollution noted at audit point 29

When considering characteristics of urban neighborhoods, this specific Bronx area of study was predominantly impressive. Nevertheless there is always room for quality advancement. In order to initiate optimal population health and reduce chronic stress, public health professionals, community members and city government officials must join together to ensure the sustainability of strengths, while addressing weaknesses. State or city funding should be provided to clean up litter, graffiti and improve sidewalk conditions. Certainly, there is also a strong need for increased garbage cans and recycle bins. Further, residents must hold themselves accountable for maintaining environmental cleanliness. Subsidies should be provided to institute public recreation sites and the community should work together to organize activities, forming a strong social network. Also, residents and pubic health professionals should advocate for increased access to healthy foods. The NYC Department of Health and Mental Hygiene must ensure institutions are abiding by safety regulations in order to limit possible sources of air pollution. In order to maintain low traffic and noise volume, construction of large scale business and industrial sites should be prevented and open space must be preserved.

Here are simply a few suggestions and solutions to possibly improve this nine-block neighborhood. Ultimately, however, we can only be certain public health will prevail when all accountable parties assume responsibility and take action to better their community. More specifically, it is imperative individuals recognize the significance of the built environment and its ensuing impacts on health.



Image 6: Graffiti noticed at audit point 12

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Perdue, W. O. (2003). The Built Environment and Its Relationship to the Public's Health: The Legal Framework. American Journal Of Public Health, 93(9), 1390.

Really very nice work. Your writing is clear and methods are solid. Aside from the few comments above, and what we discussed in class, I am extremely happy with your submission.

GRADE: A

INDOOR AIR QUALITY

PH754



MAIN OBJECTIVE

- To understand the effects of poor indoor air quality



TABLE OF CONTENTS

- Danger Levels of Indoor Air Quality
- Indoor Air Quality related deaths broken down by disease
- Indoor Air Quality around the world
- Attributable deaths resulting from burning fuel indoors around the world
- Hours spent in Africa around these fuels

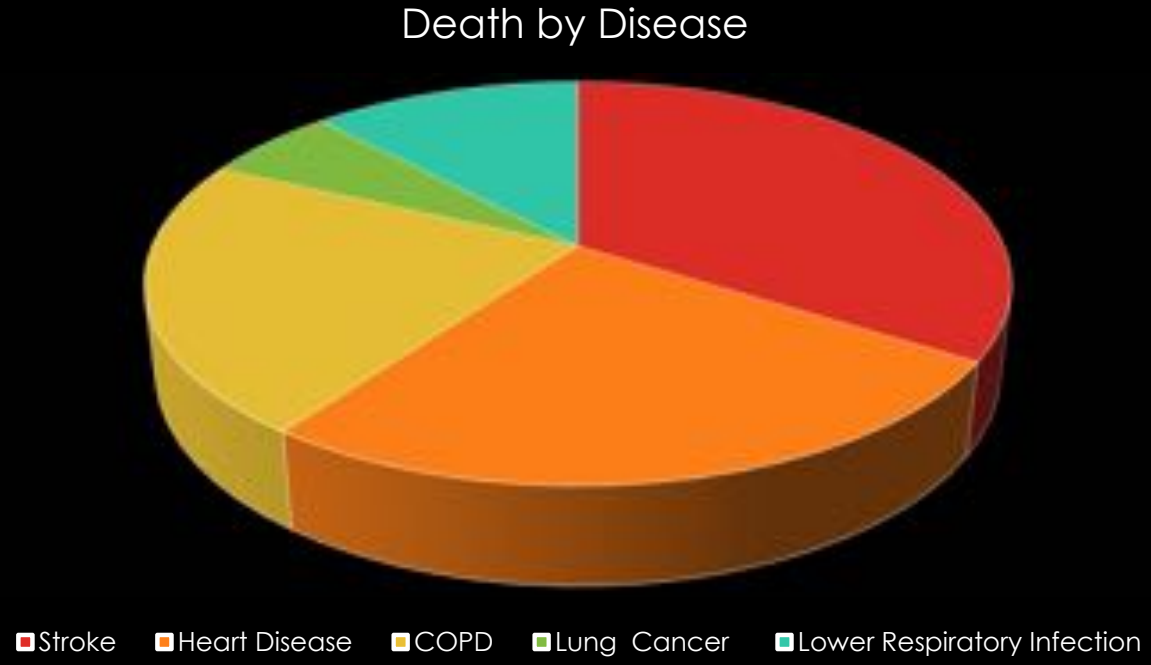


DANGER LEVELS OF INDOOR AIR QUALITY

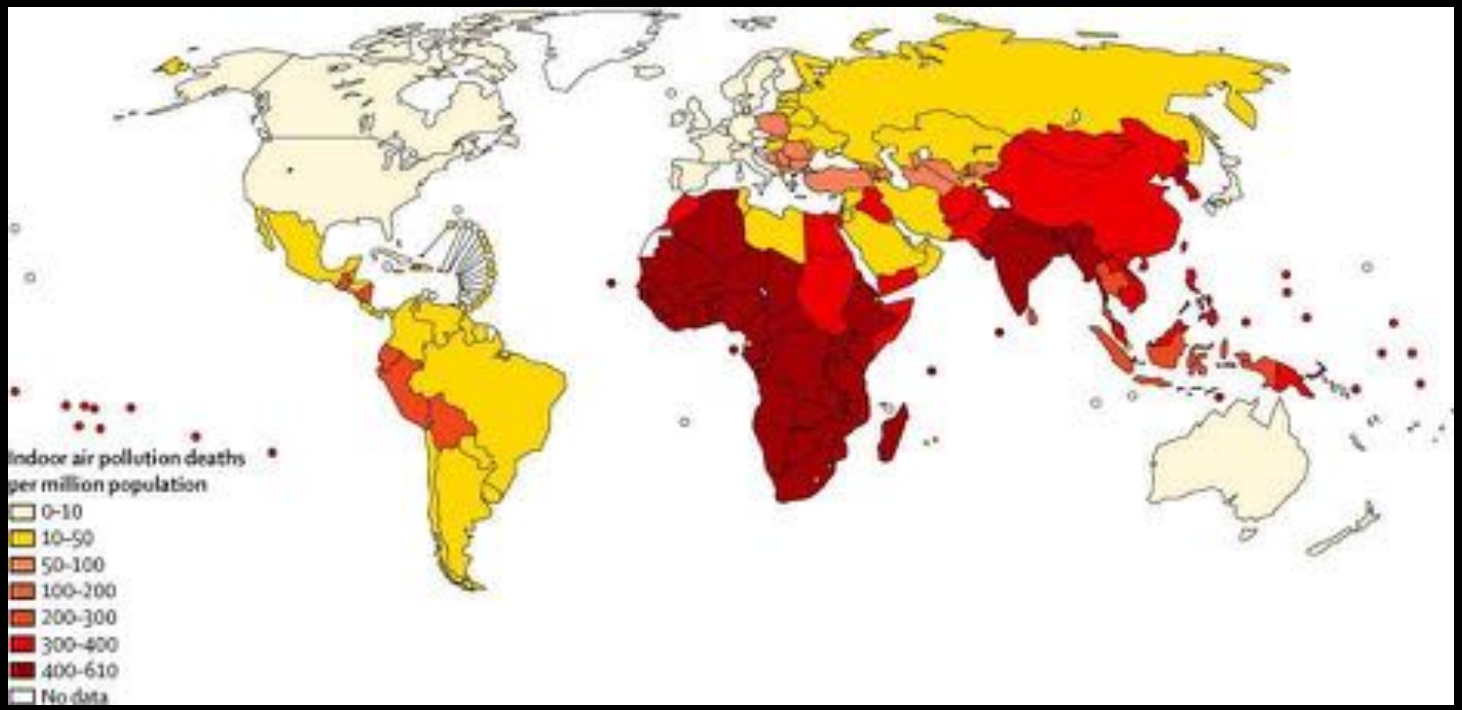
LEVEL 1	LEVEL 2	LEVEL 3
Allergens & Particulates	Infectious Agents	Toxic Compounds
Dust, Mold, Mildew, Smoke	Legionella, SARS, H1N1, influenza	Formaldehye, Toluene, Benzene
Health Effects	Health Effect	Health Effects
Nose and throat irritation, runny nose, congestion, sneezing, coughing, wheezing	Sinusitis, Upper respiratory Infection, Bronchitis, Pneumonia	Memory Lapse, Blurred Vision, Nausea, Vomiting, Headaches



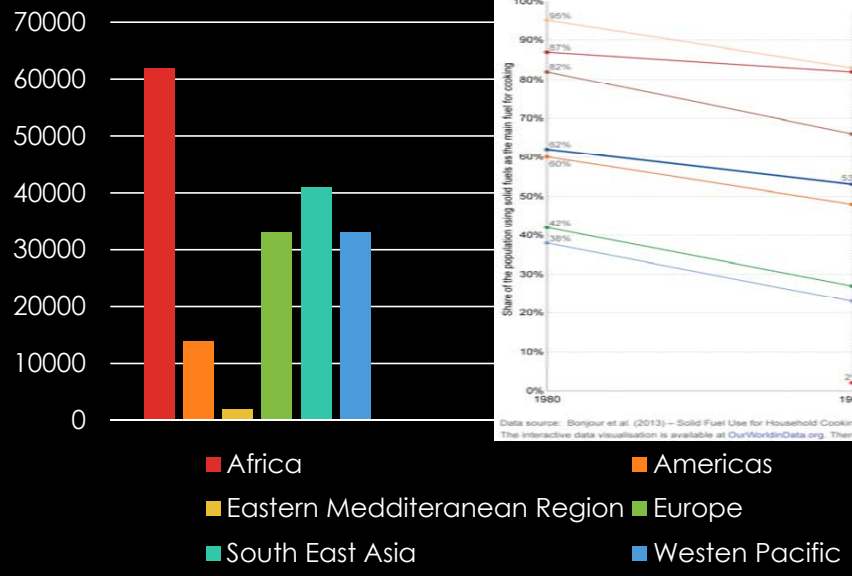
AIR POLLUTION DEATHS BROKEN DOWN BY DISEASE

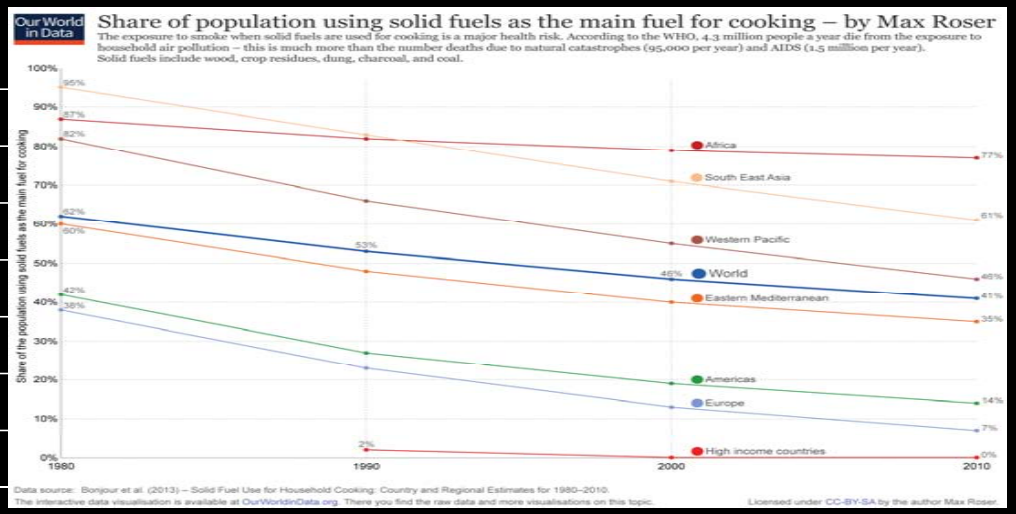


INDOOR AIR QUALITY AROUND THE WORLD

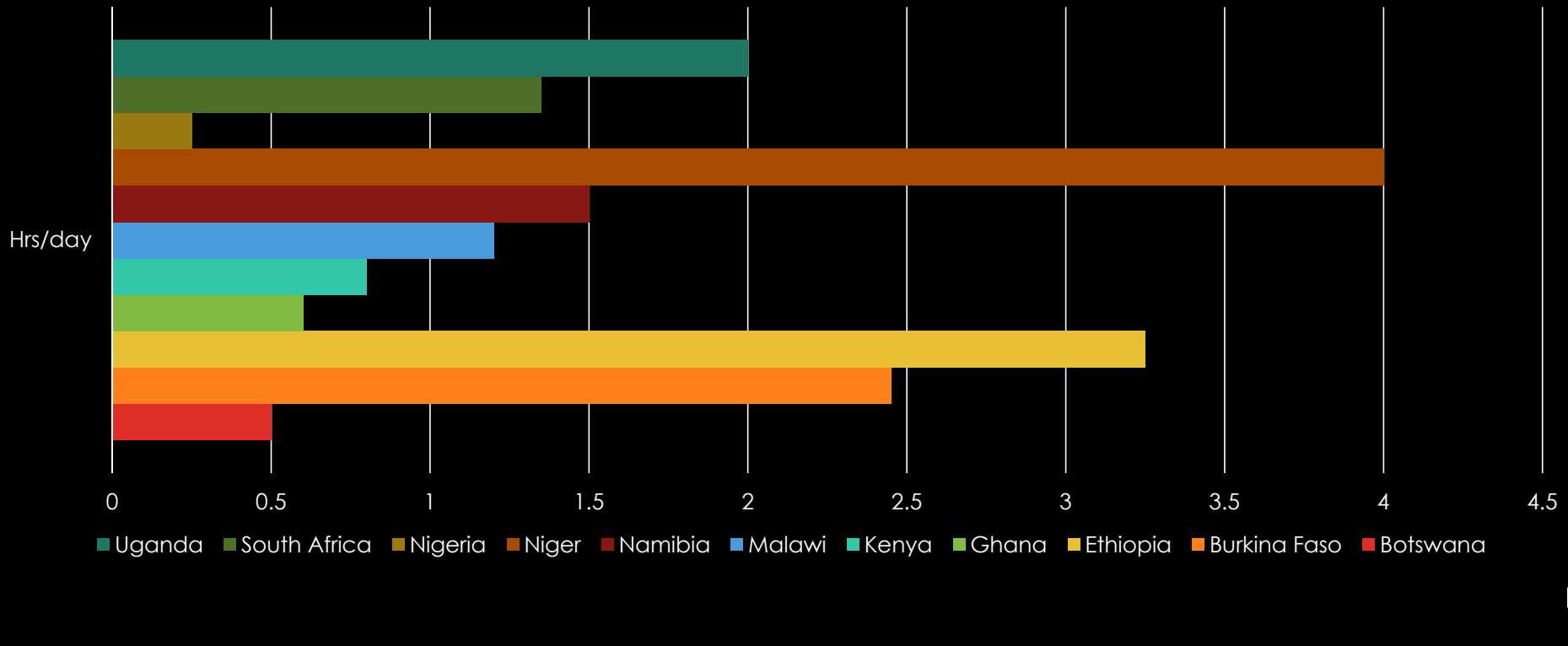


ATTRIBUTABLE MORTALITY PER 100 000 PEOPLE FOR INDOOR SMOKE FROM SOLID FUEL USE BY WHO SUBREGION





HOURS SPENT WITH SMOKE STOVES A DAY IN AFRICA



SUMMARY

- Poor Indoor air quality can have adverse health effects and can result in death
- Around the world Africa and South Asia have the biggest indoor air quality issues
- This is a result of the fuels they use for cooking
- This can be mitigated by cooking with cleaner burning fuels



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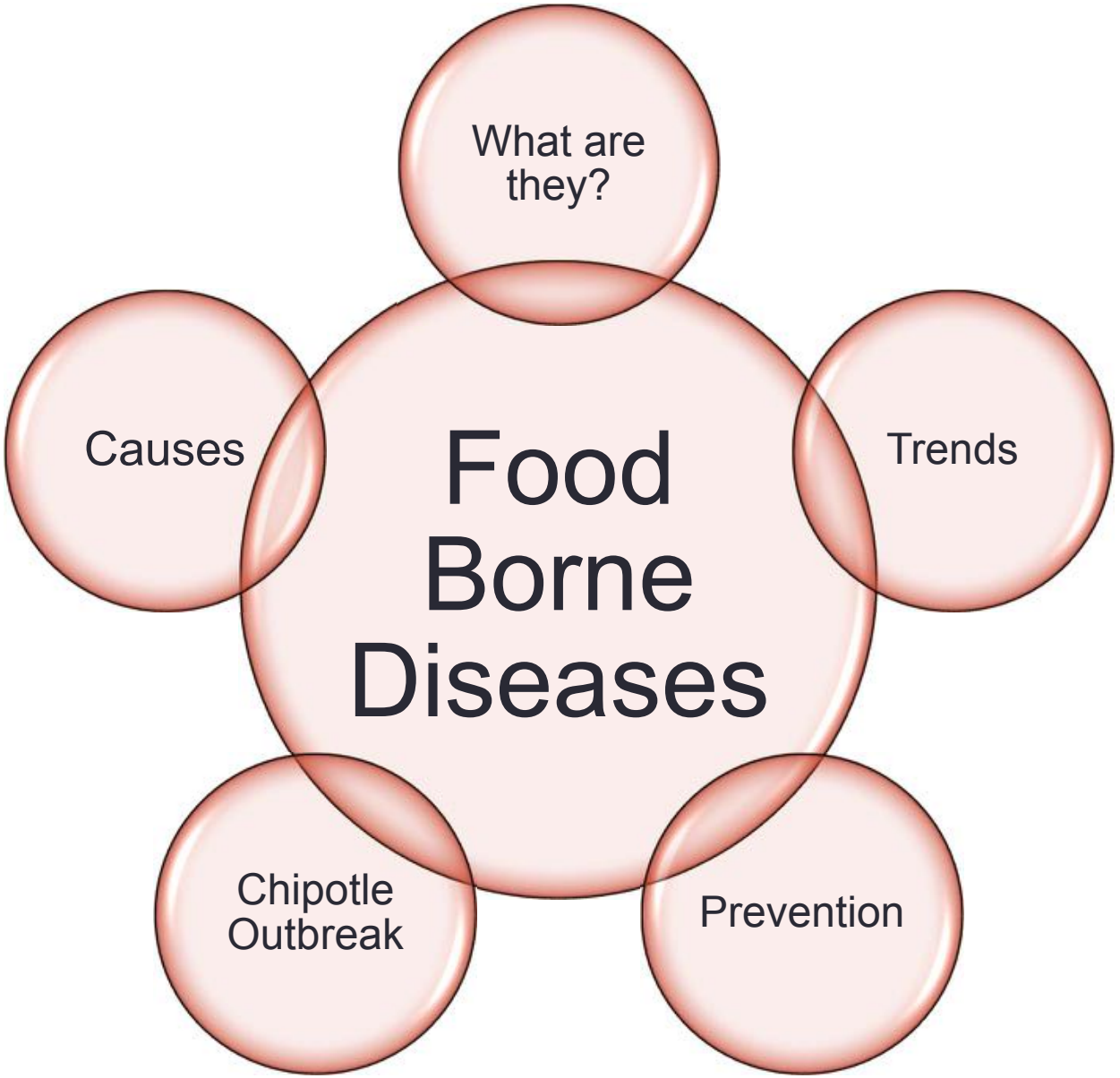
- http://ourworldindata.org/data/environmental-change/indoor-air-pollution/



FOOD BORNE DISEASES

Environmental Health


What are they?
Causes
Food Borne Diseases
Trends
Chipotle Outbreak
Prevention

What are Food Borne Diseases?



Infectious disease spread through food or drinks



Can be caused by bacteria, viruses, or parasites



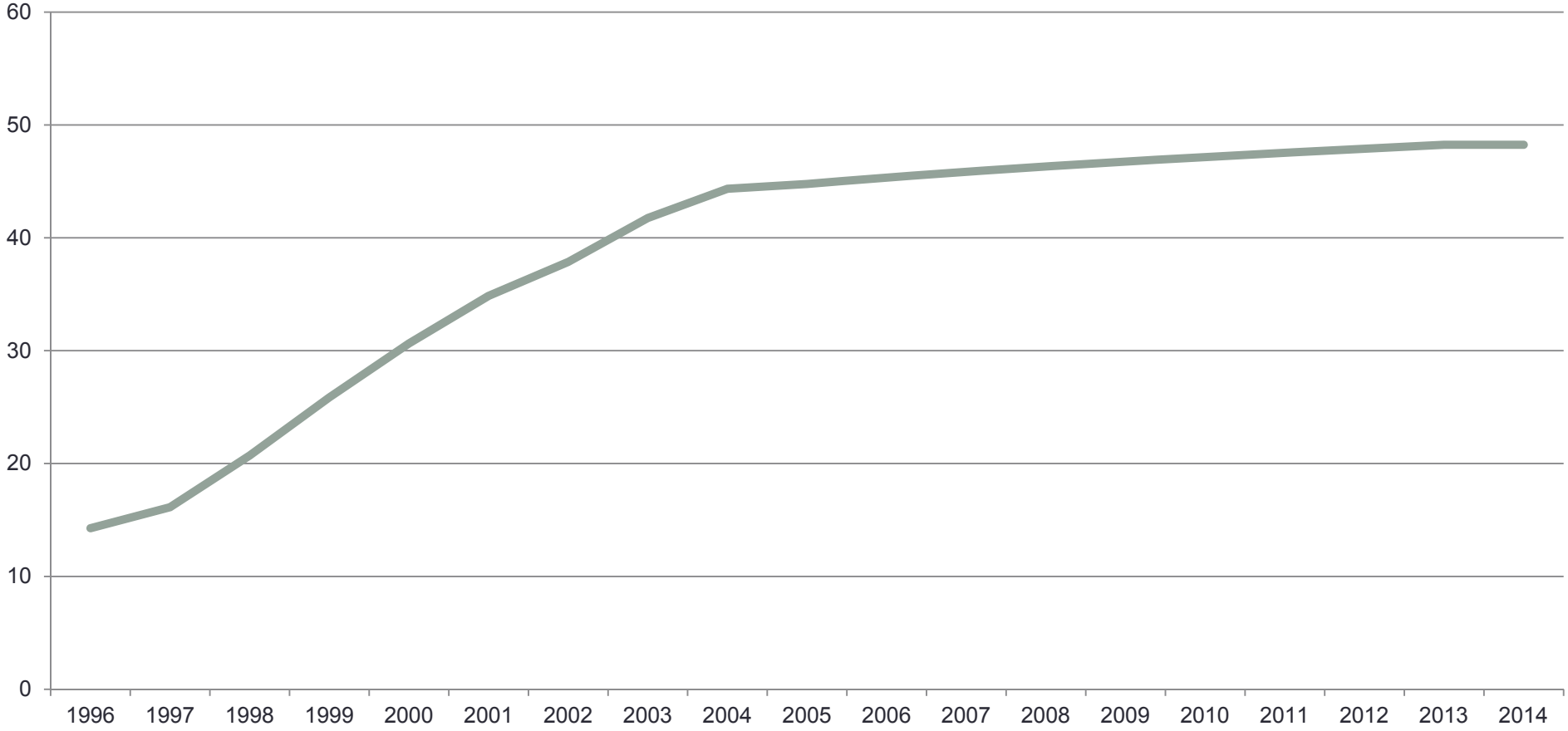
Common symptoms: diarrhea, vomiting, abdominal cramps, nausea, fever, joint/back aches, and fatigue

Botulism	Muscle-paralyzing disease caused by a toxin made by a bacterium
Campylobacteriosis	Infection occurs from handling raw poultry, eating undercooked poultry, drinking nonchlorinated water or raw milk, or handling infected human or animal feces
E. coli	O157:H7, cause serious poisoning in humans, including major disease outbreaks from contaminated food
Hepatitis A	Contagious liver disease that results from infection with the Hepatitis A virus from contact with objects, food, or drinks contaminated by the feces, or stool, of an infected person
Norovirus Infection	Commonly known as "stomach flu.” The virus causes your stomach or intestines or both to get inflamed
Salmonellosis	“Salmonella” bacteria. can be found in food products such as raw poultry, eggs, and beef, and sometimes on unwashed fruit
Shigellosis	Intestinal infectious disease caused by *Shigella* bacteria




Clean
Separate
Chill
Cook

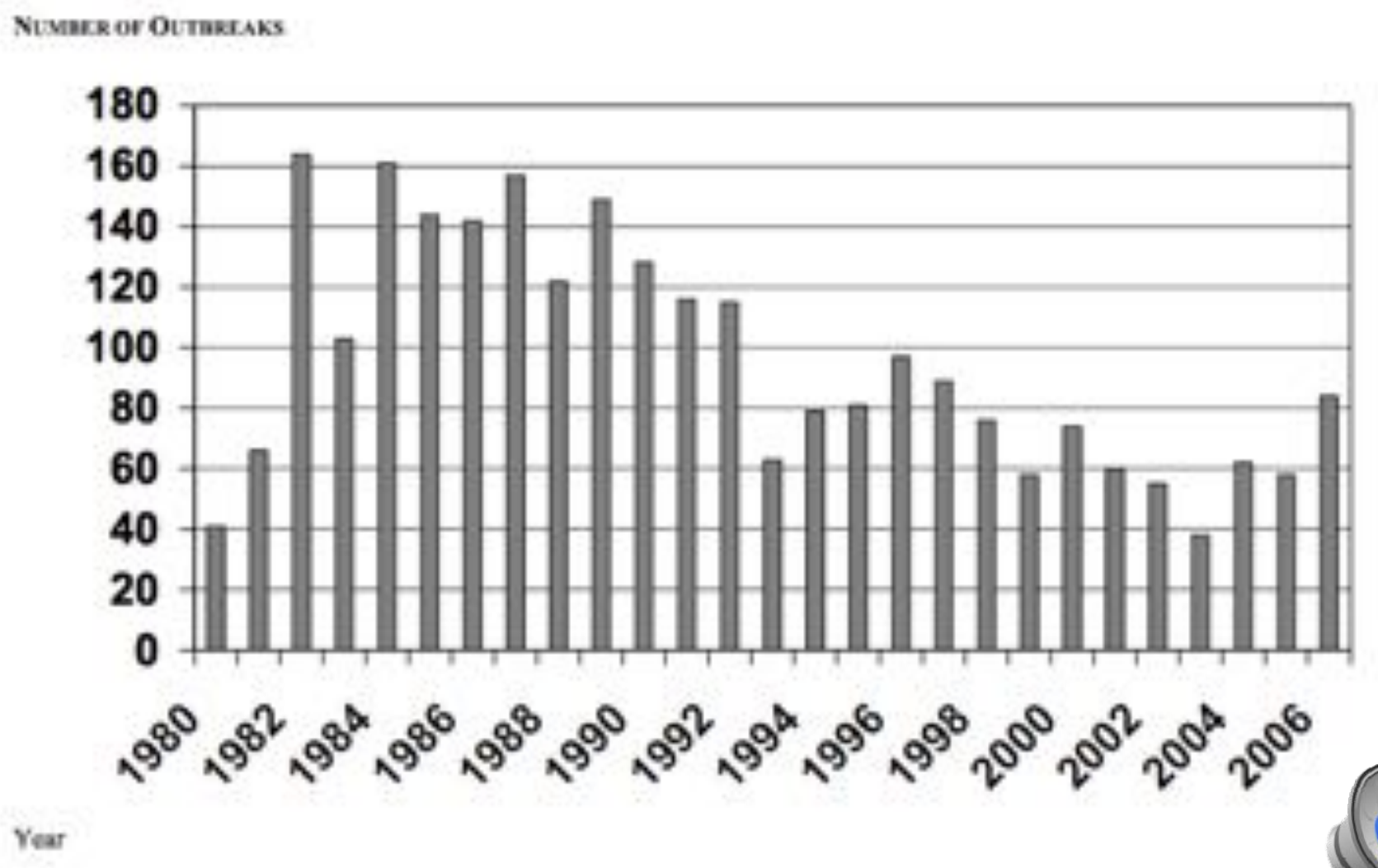
Number of New Cases of Confirmed Food Borne Diseases in the US (millions)

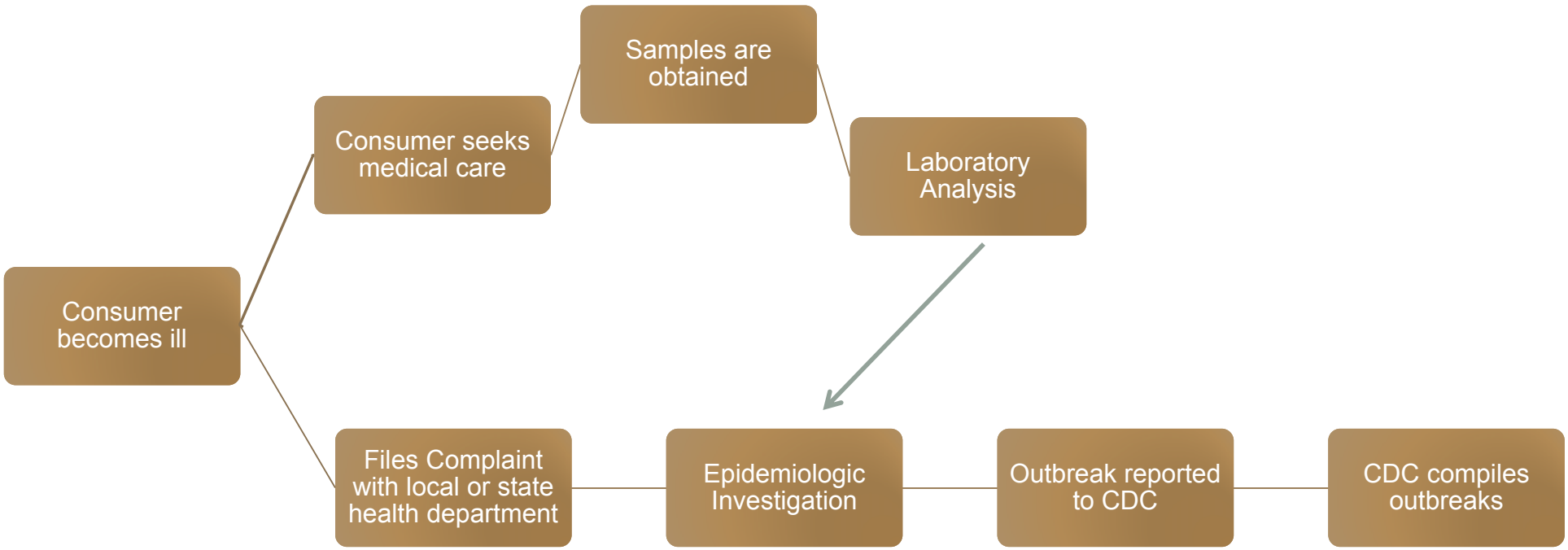


Source: CDC
http://www.cdc.gov/features/dsfoodsafetyreport/



Number of Outbreaks in NYS




Consumer becomes ill
Consumer seeks medical care
Samples are obtained
Laboratory Analysis
Files Complaint with local or state health department
Epidemiologic Investigation
Outbreak reported to CDC
CDC compiles outbreaks



2015 Chipotle Outbreak

- Shiga toxin-producing *Escherichia coli* O26 (STEC O26)
- 52 people
- 9 states have been sickened
- 20 people hospitalized
- No deaths
- Investigation has not identified what specific food is linked to illness

In Conclusion .

- Food Borne Illnesses are infections of the GI tract
- Caused by Bacteria, Viruses, or Parasites
- In US number of food borne illnesses is increasing, although in NYS it appears to be declining
- Chipotle is the most recent foodborne illness outbreak, that has affected the United States nationally



The End

1. "Cleanliness Helps Prevent Foodborne Illness." Cleanliness Helps Prevent Foodborne Illness. Web. 14 Dec. 2015. <http://www.fsis.usda.gov/wps/wcm/connect/bd93c271-2cfc-4fbe-93c9-28d6070fa7bb/Cleanliness_Helps_Prevent_Foodborne_Illness.pdf?MOD=AJPERES>.
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3. "Foodborne Disease Outbreaks In New York State 2006." *Foodborne Disease Outbreaks In New York State 2006*. Web. 16 Dec. 2015.



PH 754 Env Health - Data Assignment Scores		
90	Max points possible	Points Earned
GENERAL FORMATING	**10**	7.5
Title page with all information (with name at top right?)	2	1.5
Table of Contents complete and organized (paginated and sections numbered)?	5	4
Pages numbers (first graph is page 1,.....)	2	1
Color printing / layout / etc	1	1
OVERALL QUALITY OF TABLES/FIGURES	**20**	18
Are Tables/Fig organized from general to specific (where appropriate?	5	5
Is each Table / Figure numbered and properly labelled	5	4
Are X/Y coordinates properly labelled?	5	4
5 figures, tables, charts etc (no more than 1 cut/pasted?)	5	5
OVERALL QUALITY	**10**	10
Adequate in Length	5	5
Does write up address information in Tables/Fig?	2	2
Quality of writeup	3	3
REFERENCES	**10**	9
Each Table/Fig referenced?	2	1
Current source	2	2
Proper reference style?	2	2
Peer-reviewed / Authoritative sources?	4	4
TOTAL	**50**	**44.5**
Adj to 100 % ===>		89
Available on YouTube?	**3**	1
FINAL GRADE ==>		90

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very well done, good use of slide space and images.
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COMMENTS
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ok
lots of background noise distracts viewer. Use headset to reduce that. YT link doesn't work.. No extra credit

PH 754 Env Health - Data Assignment Scores

96	Max points possible	Points Earned
GENERAL FORMATING	**10**	9
Title page with all information (with name at top right?)	2	2
Table of Contents complete and organized (paginated and sections numbered)?	1	1
Pages numbers (first graph is page 1,.....)	1	0
PPT advances automatically with narration starting automatically	2	2
Use of color / images / animation	2	2
Overall formating / PPT skills	2	2
OVERALL QUALITY OF TABLES/FIGURES	**20**	18.5
Are Tables/Fig organized from general to specific (where appropriate?)	5	5
Is each Table / Figure numbered and properly labelled	5	4
Are X/Y coordinates properly labelled?	5	5
At least 4 handmade (original) figures, tables, charts etc (no more than 1 cut/pasted?)	5	4.5
OVERALL QUALITY OF ASSIGNMENT?	**10**	10
Adequate narration Length	3	3
Does write up address information in Tables/Fig?	3	3
Quality of writeup (well resched?)	4	4
REFERENCES	**10**	9
Each Table/Fig referenced?	2	1
Current source	2	2
Proper reference style?	2	2
Peer-reviewed / Authoritative sources?	4	4
TOTAL	**50**	**46.5**
Adj to 100 % ===>		93

heet
COMMENTS
ok
Interesting style but I wanted traditional with numbers and pages.. But ok
no
yes
yes, but some animation would be nice.
ok
COMMENTS
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somewhat
yes (more or less)
more graphs needed. I see only 2 and lots of tables etc..
COMMENTS
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somewhat
more needed.. Only 3?

PHE 606

Descriptive Epidemiology Paper

[redacted]

Herpes Zoster in the US

Herpes Zoster (HZ), commonly known as shingles, is a disease that occurs in about 1 million people per year in the United States.[2, 4,7,11] The CDC estimates that in the United States 1 out of every 3 people will develop HZ at some point in their lifetime.[11] HZ manifests as a cutaneous disease that is typically localized to an area on the skin, and causes extreme pain.[3, 11] This rash typically lasts for 7 to 10 days, and can reoccur at different times, side effects from HZ can last for years. [11] Studies have shown that approximately 0.28 to 0.69 per 1 million deaths are associated with HZ each year.[6]

The cause of HZ is the varicella zoster virus (VZV), this is the virus that causes chickenpox. Once a person has recovered from chickenpox the VZV does not leave the body of the person. Instead the VZV stays dormant within the cranial nerve or dorsal root ganglia.[3-6,8,11] Reactivation of VZV changes the virus to HZ. [3-6,8,11] The virus mutation no longer presents as chickenpox, it now becomes the blistering painful rash known as shingles. Therefore any person who has ever had the VZV is at risk for developing HZ.

Even though the population at risk for HZ is very large there are certain risk factors that make HZ more susceptible to certain groups of people, and make the effects from contraction of the disease more dangerous. It is commonly known that people with medical conditions that suppress the immune system, or people taking medications that suppress the immune system are more likely to develop HZ, examples include; HIV, cancer, and people that have had transplants. [3,6-8,10] People who have underlying causes that develop HZ are more likely to contract postherpetic neuralgia (PHN). PNH is a continuing pain located in the area where the HZ rash was once located. [6] PHN is just one of many complications people suffer due to HZ. Other complications include scaring, and continuous tremors at the site of the rash.

As stated earlier, anyone who has ever had the chickenpox is at risk of developing HZ. This means that there is no age limit for contraction of this disease. A recent study showed occurrences of HZ in children as young as 6 years old. This particular study looked at 277 children with asthma vs 277 children without asthma. They found that there is a 12% increased associated risk for children with asthma to contract HZ than for children who did not have asthma.[4] Although this risk is relatively high, in general children are at a very low risk for contracting HZ, this is because most children in the U.S. are now being inoculated for VZV.[4] HZ is most commonly found in elderly populations.

In the US around 200,000 adults, 50 to 59 years of age, develop HZ annually. [9] Approximately 10 in every 1,000 people 60 years or older will develop HZ. [11] Of the elderly population at risk, studies have shown that females are at a much higher risk for the disease than men. [2,3,6,11] One study looked at HZ incidence rates in men and women from 1994 – 2000. This particular study showed that in 1994 there was a 28% increased incidence among females than in men. In 2000 the study showed that the increased incidence among females than males increased to 33%.[3] Another example is that of a 19 year study that was designed to study the links of HZ incidence related to the VZV vaccination. This study found that as of 2010, 14% of men and 20% of women in the U.S. who reached the age of 65 would have HZ during the remainder of their lifetime. [2]

Ethnicity also seems to factor into the risk of contracting HZ. A North Carolina cohort study showed that white people had 2/3 the risk of contracting HZ compared to black people. [6] Other studies examined referenced studies that showed white people at a higher risk of contracting HZ than black people.[1,2] One study that examined ethnicity found that white people had more than a 50% increase of contracting HZ, when compared to black and Hispanic groups. [2] One of the studies explained that there is a reduced risk of HZ among people with Caribbean and Central American origins.[6] This study concluded that it may be

because less people are exposed to VZV in those countries, and/ or that they may be exposed to VZV at later years of life than other ethnic groups.[6]

No research has been done that shows a significant relation of the HZ virus to geographical location. Some of the studies examined looked at cases of HZ from different parts of the country. One particular study grouped people according to their geographic region in the U.S. this includes; Northeast, South, Midwest, and West, the incidence after being standardize for age and sex showed to be 2.9, 3.2, 3.3, and 3.3 per 1000 person years respectively.[3] The study found very little variation between regions and their association with frequency of HZ.[3] Another study examined seasonal incidences of HZ but found no significant relation. [6] As stated earlier one study showed a reduce risk for HZ among people with certain ethnic backgrounds.[6] It is important to note that the study concluded that this was because most of those people may have been exposed to VZV at later ages compared with those in other ethnic groups. [6]

Currently research has shown that the incidence of HZ has increased over time. [2,6,11] One study that examined Medicare beneficiaries from 1992-2010 showed an " incidence increase of 39% from 10.0 per 1000 person-years in 1992 to 13.9 per 1000 person-years in 2010."[6] The CDC stated that the incidence of HZ has been increasing gradually over long periods of time.[11] Some studies believe that the increase in HZ over time may be due to the inoculation of VZV which leads to people who have already had VZV to not be exposed over time to the VZV in people surrounding them which they believe would have boost cell immunity. [2,3,11] A study examining the relationship of the incidence of HZ and the vaccination concluded that the increase of HZ in the U.S. was already occurring before the vaccination was in use.[2] One study discussed that the reason for the increase in incidence of HZ might be because of the increase in diseases that suppress immune systems, such as an increase of cancer over the years, or an increase of immunosuppressive drugs to treat different diseases.[6] It is important to note that although the current population of people 40 years and older have a 96.9% risk exposure to HZ because they were

never vaccinated for VZV, the upcoming generation will be different. [2,6] The amount of people vaccinated for VZV has been continually increasing since 1992.[2] Once the older generation dies out, the population in the U.S. at risk for developing HZ will be significantly lower. The risk for developing HZ has also decreased significantly because of the new HZ vaccination which was introduced into the U.S. market in 2006 for adults 60 years and older.[9] Since that time the FDA has made the vaccine available to adults aged from 50 years and older. This vaccine has shown a reduced risk of developing HZ by 70%.[9] Although the vaccine is relatively new, the CDC hopes that introduction of this vaccine into the U.S. population will begin to lower risks of people developing HZ.[11]

HZ is currently very prevalent in the U.S., as stated earlier the CDC estimates that 1 in every 3 people will develop HZ during their life time.[11] The main risk factor for making someone susceptible to the disease is the development of VZV in an individual. This means that there is no particular age group that is exempt from developing HZ. It is know that as people age the incidence of HZ increases significantly. This makes the population of people older than 50 years more at risk for developing the disease.[9,11] Studies have also shown that females have an increased risk of developing the disease.[2,3,6,11] White people in the U.S. have higher incidence rates than black and Hispanic people. [1,2] There have not been many studies done to show any links between socio-economic status, or geographic location in relation to increased incidence of HZ. It may be important to begin to examine the effect that the VZV vaccine has on the incidence rate of HZ over time. Currently the VZV vaccine seems to show no effect on HZ prevalence.[2] HZ has been increasing over time since before the introduction of the VZV vaccine in the U.S.. [2,11] There is no information as to why HZ has increased over time, some studies suggest that it could be because of the rise of immunosuppressant diseases or drugs. [6] Over time it is believed that the prevalence of HZ in the U.S. will begin to decrease due to the new HZ vaccine, and because of the VZV vaccine which would prevent occurrence of HZ.[6]

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[redacted]- Grading rubric:

	Total points	Points earned	Comments
Content:			
Paper includes brief description of the condition and its risk factors	5	**5**	
Paper describes distribution by person (using proportions and rates)	5	**5**	
Paper describes distribution by place (using proportions and rates)	5	**5**	
Paper describes distribution by time (using proportions and rates)	5	**5**	
Paper accurately summarizes incidence, mortality and/or prevalence data	5	**5**	
Paper cites 10 or more peer-reviewed articles	5	**5**	
Citations are appropriate; paraphrasing is used, rather than direct quotes	5	**5**	
Writing:			
Sentences in paper are clear and well-written (few grammatical errors or typos)	5	**4.5**	I have highlighted some spots where your writing could have benefitted from further proofreading/editing.
Paragraphs contain topic sentences, and develop one main idea using supporting details	5	**5**	
Paper is organized with a clear introduction, main body, and conclusion	5	**5**	
Total	50	**49.5**	

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Epidemiology Descriptive Paper

Heart Disease in NYC

Heart disease is the number one killer in the United States. This is also true for New York and more specifically for New York City. It is been shown that 1 in 4 adults in the U.S dies from heart disease.[1] Heart disease is a general name given to diseases affecting the heart and the cardiovascular system. There are however, different types of heart disease categorized as: Coronary heart disease CHD, Cardiovascular Disease CVD, and Hypercholesteamia characterized by high levels of LDL in blood serum.[2] In this paper is discussed how heart disease is affecting New Yorkers; and assessment is made about the prevalence, rate and mortality trends in New York City.

Risk factors contributing to heart disease include: hypertension, obesity, lack of exercise, tobacco use, diet, high glucose levels, environmental pollution, and total high cholesterol levels. Even though mortality rates have been shown to decrease in the past decade, with a recorded decline of 28% age adjusted death rate from 1999-2009 nationally, heart disease is still a major problem in NYC.[2,1]

In 2009, the prevalence of hypertension in NYC among adults was 25.6% CI (23.4%-27.8%) Reference needed. Although males and females were found to have the same prevalence, males had a higher mean blood pressure of (120/73.8mmHg for men vs. 115.7/68.7mm Hg for women) Reference needed. Age is considered to be a major risk factor for heart disease, whereas this risk at baseline for adults in NYC in 2008 was 6.8% for 22-44yr olds , this risk was increased to 71.0% for adults aged 65 yr. or older Reference needed. Heart disease prevalence was much

higher for minorities compared to the white population in NYC. For Blacks this prevalence was 32.8% compared to Hispanics 26.5% compared to Whites (21.1% P<0.001). [3]This shows the racial disparities when it comes to heart disease in NYC.

Low socioeconomic status might be a factor in having such a high prevalence among minorities in NYC. Interestingly enough, a study done in 2004 found that foreign born adults residing in NYC, had the greatest mean level of total cholesterol compared to all other foreign born adults in the U.S. Reference needed Although this trend was true only for foreign born individuals who had been in New York City for more than 10 years.[4]

Centers for Disease Control report Coronary Heart Disease as the most common type of heart disease contributing to high mortality rates affecting 1 in 4 adults in the U.S Reference needed. A study done on the prevalence, awareness and treatment of LDL levels among adults in NYC in 2004, found that ¼ of adults had high LDL cholesterol, among those 1/3 of adults were not aware of this condition Reference needed. For the rest who were aware, less than 2/3 of them were taking medications to control cholesterol and less than ½ were actually able to control high LDL cholesterol. [4] These findings present the necessity for the establishment of food and tobacco policies that will have as aim the reduction of risky behaviors involving unhealthy food and tobacco use that are contributing factors in increasing rates of heart disease incidence in NYC.

Inequalities in getting medical care, might also contribute to heart disease. A study done by Nguyen et al in 2010, used NYC HANES data to find that inequalities in disease management contribute to the health disparities observed in NYC Reference needed. People that did not have regular checkups to primary care doctors , were more likely to be affected by heart disease even though they might have been insured Reference needed. Heart disease is a condition were primary care is crucial in avoiding the development of this disease. People who were not

receiving a constant routine medical care, were 2-3 times more likely to not get diagnosed early, or were unaware of their condition of hypercholestomeia or hypertension Reference needed. Not having a "place of care" is associated with having higher CVD rates associated with higher Blood pressure and higher HDL level. This was more pronounced for people living in underserved communities who were < 65 years old.[5]

Other studies have found a link relating socioeconomic status to heart disease. A study by Onwanyi in 1999 found that Central Harlem residents belonging to low socioeconomic status, mostly people of color aged 25-64 yr. old, were twice as likely to die from CVD compared to the rest of the NYC population Reference needed. They also reported hypertension as the leading cause of death among these minorities. This shows that socio-demographic factors are related to heart disease.[6]

Diabetes is another risk factor contributing to cardiovascular disease. In 2009, Thorpe et al found that 2/3 of adults greater than or equal to 20yr old who had been diagnosed with diabetes, were hypertensive Reference needed. 43.1% of those who had high blood pressure, did not control either with drugs. They also found that ¾ of adults diagnosed with diabetes had also high LDL levels and 42.8 of them were undiagnosed for high cholesterol Reference needed. Adults with diabetes were more likely to have high LDL and higher blood pressure than the ones who were not.[7]

Lifestyle changes have been shown to be successful in reducing heart disease rates in elementary school children. A study done on elementary school children in 2012, found that children who attended dance lessons after school, and were health educated, reduced heart disease and diabetes risk.[8]

All the above studies suggest that heart disease manifested through high blood pressure, high LDL levels or diabetes, is indeed a major health problem in NYC. The prevalence of heart disease has remained constant in New York City (25%), even though mortality rates have decreased in the past decade.[1] This shows that heart disease is a concern because it can affect everyone, although having low socioeconomic status certainly contributes to the high rates of this disease dominating in poorer areas. It is important to notice that heart disease does not only affect adults, it is also prevalent in young children and thus education and lifestyle changes are crucial to stop the spread of this disease.[8] Reforming health policies that mitigate the effects of low socioeconomic status, discrimination, poor diet, tobacco use and adapting healthy lifestyle changes, are good steps to start lowering heart disease rates in NYC.[9, 10]

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[redacted] - Grading rubric:

	Total points	Points earned	Comments
Content:			
Paper includes brief description of the condition and its risk factors	5	**5**	
Paper describes distribution by person (using proportions and rates)	5	**5**	
Paper describes distribution by place (using proportions and rates)	5	**5**	
Paper describes distribution by time (using proportions and rates)	5	**5**	
Paper accurately summarizes incidence, mortality and/or prevalence data	5	**5**	
Paper cites 10 or more peer-reviewed articles	5	**5**	
Citations are appropriate; paraphrasing is used, rather than direct quotes	5	**4**	It is important that you provide references each time that you make a claim.
Writing:			
Sentences in paper are clear and well-written (few grammatical errors or typos)	5	**4**	I have highlighted spots where sentences are incomplete, language is awkward, or further proofreading/editing is necessary.
Paragraphs contain topic sentences, and develop one main idea using supporting details	5	**5**	
Paper is organized with a clear introduction, main body, and conclusion	5	**5**	
Total	50	**48**	

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PHE 606- Descriptive Epidemiology
Type 1 Diabetes

Type 1 diabetes- orT1D- has become fairly well-known in our society in recent years. Although the specific etiology of the disease is unknown, it is believed that external factors exacerbate pre-existing conditions within the body, causing an autoimmune reaction that destroys Beta-cells in the pancreas (Patel). This in turn causes the body to produce little or no insulin- a hormone necessary for the conversion of sugar to useable energy (Patel). Both adults and children are at risk for developing type 1 diabetes; 85% of people living with type 1 diabetes in the US are adults while 15% are children; this amounts to five percent of the total diabetes population (JDRF). Worldwide, the prevalence of T1D in youth- defined as individuals less than 20 years old- is estimated at 2.13 per 1,000 and is predicted to rise to 5.20 per 1,000 by the year 2050 (Patterson, WHO). Additionally, the cost of medical treatment for diabetics is at least two times greater than treating a non-diabetic (Dabelea). This disease is of importance because there is no cure for T1D and individuals with T1D have a lower life expectancy those who do not (University of Pittsburg).

The Juvenile Diabetes Research Foundation (JDRF) estimates that 15,000 children and 15,000 adults are diagnosed with type 1 diabetes annually and expects incidence rates to increase by 3% each year for children less than 14 years of age. The American Diabetes Association (ADA) estimated 1.2 million people had T1D in 2012. Between 2001 and 2009, there was a 21% increase in the prevalence of type 1 diabetes among youth less than 20 years old (Dabelea). During that time, increases in incidence rates were evident across almost all racial, gender and age groups; Native Americans and children less than 5 years old were the only

exceptions. The distribution of the disease however, remains constant over time. The prevalence of T1D in youth is greatest among non-Hispanics whites, followed by Hispanics then blacks (Dabelea, JDRF).

Most children are diagnosed with type 1 diabetes between the ages of five and seven years old (Patel). It is diagnosed when certain symptoms appear such as: increased hunger and food consumption without weight gain, increased thirst and frequent urination. Once diagnosed, a lifetime of balancing diet, medications, blood glucose monitoring and frequent doctor visits begin. If not properly controlled, high blood glucose levels in the body will cause damage to one or more of the body's internal systems which can result in comorbidities such as: kidney failure, blindness, cardiac disease, hypertension, stroke and amputation of limbs (Amed). If children are not taught how to manage their diseases early on, they develop habits that follow them into adulthood and the results are devastating physically, mentally and financially. Minorities and people with lower socio-economic status (SES) develop these adverse outcomes more frequently than whites, leading to higher morbidity and mortality rates (Darmon).

Frey links single-parent households, low socioeconomic and low socio-demographic status to poor nutrition- which is detrimental to the health of a diabetic. Management of this T1D requires individualized treatment plans involving proper dietary habits, physical activity and adherence to medications (CDC, JDRF). Minorities and individuals of lower SES may not have the financial means, availability of certain resources or access to healthier food options to help achieve their medical goals, so this population has lower rates of compliance with prescribed regimens (Darmon). This may be due in part to the disproportionate number of

unhealthy food sources that exist in these neighborhoods (Darmon) or to the higher prices of fresh fruits and vegetables that are essential to a diabetic's diet, especially when compared to fast foods or snack items. Other priorities and budgetary constraints may cause the management of the disease to be deferred until something serious occurs.

Unlike many other illnesses that may only affect a single body part or organ, diabetes has the potential to affect the entire body and treating the disease over a person's lifetime can add up very quickly. Annual medical costs for treating a diabetic is twice as high as treating a patient without diabetes; in 2012, the US spent about $245 billion on diabetes (ADA). These costs covered direct care expenses such as medical supplies, payment to facilities, providers and medications as well as indirect costs such as loss of productivity, absenteeism from work and mortality (ADA). The CDC lists diabetes as the seventh leading cause of death in the US in 2014- type 1 was not differentiated from type 2. The World Health Organization (WHO) lists diabetes as number 8 out of the 10 leading causes of death globally in 2012. Most of the deaths related to diabetes stem from cardiac complications (Davison).

Although medical advances have increased the life expectancy of T1D over time, it is still lower than that of the general population (Distiller). Some studies have found a reduction in the lifespan of a type 1 diabetic to be as much as 10-20 years. According to the CDC, the average life expectancy at birth for a male is 76.2 years and for a female it is 80.1 years. In 2012, the University of Pittsburg published a study that found the lifespan of type 1 diabetic to be 69 years old. Despite modern advances in medicine and healthcare, it remains a difficult disease to manage due to the fact that these individuals are diagnosed at such young ages (Distiller).

Unlike type 2 diabetes that is largely preventable and usually diagnosed at a later stage in life, T1D can start to have detrimental effects on the body during the earliest stages of life.

While newer studies are exploring other possible sources of T1D, science still remains unsure of its cause or why it is distributed the way it is among the population. In the early parts of the century, children with T1D were not expected to live more 3 to 4 years beyond age of diagnosis (Distiller, University of Pittsburg). Now, those odds have changed and the prevalence of adults with this disease has grown steadily, especially over the past 40-50 years. White children have a higher prevalence of the T1D, but they also have better long term outcomes when compared to blacks or Hispanics. Low socioeconomic status impacts how the disease is managed, but it does not seem to be directly or indirectly linked to a positive diagnosis. Modern research is headed in the right direction by looking to find sources of causality as other socio-demographic factors do not point to any one source.

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[redacted] - Grading rubric:

	Total points	Points earned	Comments
Content:			
Paper includes brief description of the condition and its risk factors	5	**5**	
Paper describes distribution by person (using proportions and rates)	5	**5**	
Paper describes distribution by place (using proportions and rates)	5	**5**	
Paper describes distribution by time (using proportions and rates)	5	**5**	
Paper accurately summarizes incidence, mortality and/or prevalence data	5	**5**	
Paper cites 10 or more peer-reviewed articles	5	**5**	
Citations are appropriate; paraphrasing is used, rather than direct quotes	5	**4.5**	Citation style is more appropriate for social science papers. If not using AMA style, you should use in-text citations that include at least the author and year.
Writing:			
Sentences in paper are clear and well-written (few grammatical errors or typos)	5	**5**	
Paragraphs contain topic sentences, and develop one main idea using supporting details	5	**5**	
Paper is organized with a clear introduction, main body, and conclusion	5	**5**	
Total	50	**49.5**	

Your country has a universal health coverage system. However, are there services that are not covered, or only partly covered, under that system? If so, what are they? Are there any individuals or groups who are not covered under your system? Please specify the individuals and groups. How does this compare with the U.S. health care system?

Despite Germany having a universal health coverage system, a service not necessarily offered by statutory health insurance (SHI) is long-term care. Long-term care benefits are dependent upon individual care needs and certain maximum amounts, thus pushing individuals to purchase supplemental long-term care insurance. Both home care and institutional care are provided almost exclusively by private not-for-profit and for-profit providers (Blumel, 2012). In addition to this service not being covered, "Germany ceased coverage of over-the-counter drugs as a means of cost control in 2004" (Bodenheimer & Grumbach, 2011, p. 172).

Under the universal health coverage system, certain groups are not covered. Firstly, coverage is only universal for all legal residents. Undocumented immigrants are only covered by social security in cases of illness (Brown, 2012). Secondly, military personnel are not covered. They are, however, covered through special state programs (Schabloski, 2008). Thirdly, another group exempt from SHI is civil servants. Civil servants are refunded part of their healthcare cost through their employer (Blumel, 2012). Lastly, children are excluded from the social insurance plans. They are, however, funded by subsidies derived from federal taxes (Schabloski, 2008).

In comparison, the United States does not offer universal healthcare coverage. The United States is, however, making steps towards universal healthcare through the enactment of President Obama's Affordable Care Act.

Commented [A1]: GRADE: 7/7

Great paper! I am not including a grading rubric since it would pretty much just be "YES" checkmarks down the line.

HOWEVER, please do read the comments that I made in the "comments" of this draft. Just because you did not lose points on things this time, does not mean it won't happen next time! Things like the overquoting, and the odd 2003 vs. 2010 citation WILL cost points next time.

Commented [A2]: THANK YOU for your consistent use of thesis statements!

Commented [A3]: Throughout: There is too much direct quoting! Each time you start to quote text, think about whether it is something that you can say in your own words or if it is such a unique articulation that HAS to be in the words of the original authors. The example I sometimes give to students is that Martin Luther King Jr.'s "I have a dream" speech should probably be preserved in its original form in a quote, rather than paraphrased. However a statement like, "carrots in the control group contained surplus beta-carotene" is not so special and can probably be paraphrased.

For individuals who cannot afford private health insurance or who do not qualify for insurance through their employers, Medicaid and Medicare was signed into law in 1965. Like Germany, long-term care is not offered through the Medicare program; thus driving participants to apply for supplemental managed care plans or Medicaid (Bodenheimer & Grumbach, 2012).

In regards to providing coverage for children, the United States has made excellent strides. One such success lies within SCHIP, State Children's Health Insurance Program, which increased coverage for children by expanding eligibility requirements to two hundred percent of the federal poverty rate (Bodenheimer & Grumbach, 2012).

As a final point of comparison, just like Germany, the United States does not provide medical coverage to illegal immigrants.

Who contributes the money to pay for covered health services (services under the national health plan)? What percentages of total national health care expenditures, or contributions to the health funds (whichever numbers are most readily available to you) come from which sources? Where do the monies reside: central public funds, local public funds, employer funds, or a combination of funds? How does this compare with the U.S. health care system?

Germany has a universal healthcare system covering 85 percent of the population. In 2010, SHI spending accounted for 57.6 percent of the total health expenditure and the total public spending on health constituted 77.1 percent (Brown, 2003). This system, led by a government-run health fund, relies primarily on work-based social insurance contributions (Brown, 2003). Additionally, Schabloski (2008) states:

> Consumers pay both their solidarity tax and health insurance premium directly to the applicable sickness fund. The sickness fund then remits the solidarity fund contribution to the government health fund, while the solidarity fund distributes premium subsidies to the sickness funds (p.13).

Commented [A4]: You should have made the point that Medicaid and Medicare are only for certain groups (remember the pugs!).

Commented [A5]: How are you able to cite 2010 data from a source from 2013?

Consumers' contributions to sickness funds by consumers are set at a uniform rate (Blumel, 2010). Insured employees contribute 8.2 percent of their gross wages, and employers- or pension funds- pay an additional 7.3 percent. The combined maximum contribution is an estimated $759 a month (Blumel, 2010). In addition to employee and employer contributions, Blumel (2010) reported:

> Unemployed people contribute to SHI in proportion to their unemployment entitlements; for the long term unemployed the government contributes on their behalf. In 2010, these tax transfers amounted to $19.7 billion, approximately 8 % of total SHI revenue (p.2).

While healthcare in Germany is financed primarily though SHI, the United States has multiple ways to pay for healthcare. Such payments include: out-of-pocket, individual private insurance, employment-based private insurance, and government financing. Government financing, which covers 30% of the population, accounts for 47% of national health care expenditures (Bodenheimer & Grumbach, 2012).

Commented [A6]: You really like colons. I just wanted to point that out, in case you were not aware of it!

Government financing in the United States is through Medicare and Medicaid. In 2009, Medicare and Medicaid expenditures totaled $501 and $374 billion, respectively (Bodenheimer & Grumbach, 2012). Medicare is broken up into several parts, all of which have separate financing. Medicare Part A, i.e., hospital insurance, is financed largely through social security taxes. Both employees and employers pay 1.45% of wages and salaries to Medicare, the self-employed pay 2.9%, and those with incomes greater than $200,000 pay 2.35%. Medicare Part B, which covers outpatient services, is financed by federal taxes and monthly premiums made by beneficiaries. Medicare Part D, i.e., prescription drug coverage, is also paid for by federal taxes and monthly premiums from beneficiaries. Medicaid is run by the states and funded by both federal and state taxes. Recent provisions in the Affordable Care Act will result in an increased

amount of individuals covered by Medicaid, resulting in a federal government cost of over $40 billion per year (Bodenheimer & Grumbach, 2012).

Who pays out the money to providers, i.e. which institutions? Would you consider this to be a single payer system of payment, or not? Explain your conclusion. How does this compare with the U.S. health care system?

In Germany, rather than paying physicians directly, sickness funds pay a global sum each year to the physicians' association in their region (Bodenheimer & Grumbach, 2011). In turn, regional associations pay physicians on the basis of a detailed fee schedule. The payments are based on a risk adjusted capitation with increased payments for populations with greater health problems. Hospitals are paid through "diagnosis-related groups, which include the salary of hospital-based employees" (Bodenheimer & Grumbach, 2011, p 172). In Germany, SHI offers over 145 sickness funds and there are over 43 public health insurance companies (Blumel 2010).

In the United States, providers can be paid by: private health insurance, government-based insurance, put-of-pocket and employment-based health insurance (Bodenheimer & Grumbach, 2011). Physicians can be reimbursed through a variety of payment systems. Physician payments include: fee-for-service, payment-per episode-of-illness, capitation, and payment-per-time. Hospitals can also be paid in a variety of ways, including: fee-for-service, payment-per-day, payment-per-episode-of-hospitalization, payment –per-patient, payment-per-institution (Bodenheimer & Grumbach, 2011).

Neither Germany nor the United States have single payer systems. They are not considered single payer systems because: money is not put into one fund, a single payer is not reimbursing providers, private health insurance is an option, and one specific health insurance is not accepted by all providers.

Is there any private health insurance in your country? Who buys it and for what reason? What percentages of total national health expenditures are associated with private insurance? How does this compare with the U.S. health care system?

There is private health insurance in Germany. Once enrolled in private insurance, universal health coverage through SHI is discontinued. Ten percent of Germans, with incomes more than 49,500 Euros per year, choose voluntary private insurance (Blumel, 2012). The advantage of being enrolled in private health insurance is that the insurers pay higher fees than sickness insurance, thus ensuring policyholders receive preferential treatment (Bodenheimer & Grumbach, 2011). The percentage of total national health expenditures associated with private insurance is 9.3 percent (Blumel, 2012).

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The United States also has private health insurance. Five percent of the population is enrolled, a low percentage that is the result of high administrative fees. Overall, the annual percentage of total national health expenditures associated with individual private insurance is only 3 percent (Bodenheimer & Grumbach, 2011, p. 6). Reasons as to why individuals in America may buy private insurance include: not being eligible for government financing, inability to afford out of pocket payments, and not qualifying for employment-based insurance. Similar to Germany, individuals with private health insurance receive preferential treatment and better service than those with government financed insurance.

How will the ACA make the U.S. health care system more similar or dissimilar to that of your comparison country? Be specific about which provisions of the ACA you are referring to, and cite your sources.

Although, the Affordable Care Act will not automatically make healthcare universal like Germany, certain provisions will make American healthcare similar to the healthcare in

Germany. Provisions that will make healthcare similar include, but are not limited to: improvements in coverage and improvements in care.

A provision that pushes for expanded and affordable coverage includes the mandate that everyone is to have health coverage. To aid this expansion: coverage is being extended to the age of 26 for children under their parents health insurance, any pre-existing condition exclusions for children is terminated, and -dependent upon states approval -Medicaid eligibility will be expanded (U.S. Department of Health & Human Services, n.d.).

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Germany provides free preventive care for all individuals under SHI (Blumel, 2012). An improvement in care, through the Affordable Care Act, is the coverage of preventive care at no cost. However, the preventive services provision applies only to people enrolled in job-related health plans or individual health insurance policies created after March 23, 2010 (U.S. Department of Health & Human Services, n.d.).

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Content

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Feedback to Learner

Great description of issue and of alternative viewpoints. Your solution needed more details in how it should be implemented.

National Medicaid Expansion: A Case for Universal Buy-In

Congressional Testimony Presented by

INTRODUCE THE GROUP

We are a student group presenting as part of the Public Health and Health Care Policy and Management course at the CUNY School of Public Health. We represent a wide variety of expertise on healthcare, public health, and public health policy. Throughout this course, we have studied the history, healthcare systems, policy-making processes, and guidelines that govern general public health and healthcare in this country. We are pleased to be here today to speak about the importance of expanding Medicaid services and coverage throughout all 50 states as originally mandated by the Affordable Care Act. We will address the positive and negative repercussions of Medicaid expansion from a public health perspective and will present some solutions to the oft-debated problems that such a policy could have.

STATING THE ISSUE

In our expert opinion, the states, federal government and the people of the US will benefit from getting more states to participate in Medicaid expansion. Since the Supreme Court ruling in 2012, all states have the power to decide to either adopt, partially adopt, or reject Medicaid expansion under the Affordable Care Act.[1] If states continue to refuse Medicaid expansion, insurance coverage gaps will emerge for individuals and families who fall between 50% and 100% of the Federal Poverty Levels (FPL),[2] and access to healthcare will decrease. The issue at hand is *how* the federal government can encourage more states to adopt expansion. From our perspective, the federal government's Medicaid expansion efforts should include: (1) Publishing financial comparisons of state health care budgets with and without Medicaid expansion - this will help state legislatures to see the value in participation;

(2) Emphasizing added cost for states if people use state-paid emergency services and uncompensated care because preventative care was out of reach due to lack of insurance coverage; (3) Communicating that all individuals will see reduced fees for insurance and health care if the Medicaid gap is eliminated; (4) Highlighting health care as a basic human right that governments are morally obligated to provide for their citizens; and (5) Accentuating the unique opportunity for states to start expansion *now*, while the federal government will cover all costs for the newly insured, and potentially offering longer duration of full federal financing for early acceptance of the expansion.

PROVIDE BACKGROUND

Medicaid was created as a part of the Title XIX Social Security Amendment of 1965.[3] Before the passage of the Patient Protection and Affordable Care Act (ACA), Medicaid eligibility and extent of coverage were chiefly determined by states, which had "substantial discretion to fashion eligibility and benefits to their liking"[4] though the program is financed jointly by states and the federal government, with the federal government's contributions known as the Federal Medical Assistance Percentage (FMAP).[3] FMAP is determined by the per capita income of the state, with between 50-75% of costs for those insured by Medicaid covered by the federal government.[3, 4] Generally, before the ACA, Medicaid offered "federal funding to States to assist pregnant women, children, needy families, the blind, the elderly, and the disabled in obtaining medical care"[1] with coverage for adults with children typically set below 100% the federal poverty level (FPL) and no coverage for adults without children.[5] With the passage of the

ACA, however, under Title II of the Act, eligibility for Medicaid was expanded federally to include "all individuals and families with incomes below 133 percent of the federal poverty level…"[4] a requirement that was to take effect in 2014.[5]

In 2011, the Supreme Court of the United States (SCOTUS) granted cert to hear a case formerly decided in the District Court for the Northern District of Florida, *National Federation of Independent Business* et al. *v. Sebelius, Secretary of Health and Human Services* , et al., in which fourteen states were joined by other plaintiffs in arguing, among other things, that "the Medicaid expansions were unconstitutionally coercive…"[6] SCOTUS ruled that the "threatened loss of over 10 percent of a State's overall budget is economic dragooning that leaves the States with no real option but to acquiesce in the Medicaid expansion" and that the "Medicaid expansion thus violates the Constitution by threatening States with the loss of their existing Medicaid funding if they decline to comply with the expansion."[1] Thus the Court inaugurated the current state of affairs for Medicaid in the U.S. in which 31 states, including the District of Columbia, have adopted the provisions of Medicaid expansion and 20 have not (although the issue is still under discussion in some states), (Figure 1) creating a "coverage gap" of almost 3.1 million people who are not "poor enough" to qualify for Medicaid in their state but not "rich enough" to qualify for tax credits provided by the ACA to help purchase coverage through the healthcare exchanges.[2] (Figure 2)

Those in the coverage gap are predominantly non-disabled adults without children (76%), as this population did not ever qualify for Medicaid under pre-ACA eligibility criteria, and the coverage gap has slightly more women than men (53% vs. 47%).[2] 40% of those in the coverage gap live in a family with a full-time worker, whereas 39% do not.[2] For the 1.5 million in the coverage gap who are working full-time, the majority are employed in the agricultural or service sectors (55%), 14% in professional or public administrative service, 17% in education and health services, and 8% in manufacturing or infrastructure services.[2] Incredibly, a fourth of those in the coverage gap reside in Texas, with 18% in Florida, 10% in Georgia, and 8% in North Carolina.[2]

(Figure 3) Those residing in states in the South are overwhelmingly disproportionately represented in the coverage gap (90%) as 11 of the 20 states that chose not to expand their coverage are Southern states, more poor uninsured in the U.S. are residents of Southern states, and Medicaid eligibility in these states generally is more limited than states in other parts of the country.[2] Blacks and Hispanics are also disproportionately represented in the coverage gap: 30% are Hispanic, 22% are Black, and 44% are White.[2] (Figure 4)

The ACA stipulates that from 2014-2016 those newly insured under the Medicaid expansion would have 100% of their costs covered by the federal government, a percentage that would gradually lessen until 2020, whereupon 90% of costs for those who newly qualified for Medicaid coverage under its ACA-mandated expansion would be covered indefinitely.[4] According to the Kaiser Family Foundation, though estimated costs for states that have not expanded Medicaid would increase by $38 billion dollars, from $971 billion to a little over $1 trillion dollars between 2015-2024, (Figure 5) this figure does not adjust for the estimated $266 billion-worth of care expected to be utilized by those excluded from Medicaid due to their state of residence opting out of the Medicaid expansion, which will thus will go unreimbursed.[7] Were Medicaid expansion adopted in these states, however, the burden of uncompensated care instead would be $185 billion between 2015-2024.[7] Because of variability in the amount of the burden each state would bear and difficulty in estimating these costs, the Kaiser Family Foundation estimates "that states would see between $5 and $10 billion in uncompensated care savings over the next 10 years" were they to opt into Medicaid expansion.[7] In a review of this issue, the Pew Charitable Trust points out that by not expanding Medicaid the majority of the states who have opted out are putting an added burden on their citizenry, as millions of dollars in local taxes go to local hospitals to help pay for uncompensated care for those who are indigent.[8] Overall, several studies have found "Medicaid expansion would help,

not hurt state budgets…"[7] For example, "Washington State has projected net savings of $79.0 million in state fiscal year 2014 and $258.7 million in 2015 due to expansion…[and] that Kentucky would spend $919.1 million less between state fiscal years 2014 and 2021 due to Medicaid expansion."[7]

Most importantly, however, residents of states that have not expanded Medicaid will face the hardships inherent in not having access to medical insurance, including having severe difficulties or being unable to obtain preventative care, screenings, or follow-up care for chronic illnesses, and being at an increased risk of medical bill-related debt and bankruptcy.[9] In addition, residents of states opting out of Medicaid expansion also will not be able to benefit from any additional programs being implemented by Medicaid to support housing and other supportive services, given Medicaid's "increased attention on the relationship between health and housing" and that "while Medicaid funds cannot be used to pay for room and board…[they] can support a range of housing-related activities, including referral, support services, and case management services that help connect and retain individuals in stable housing."[10] Thus, states and their citizenry, especially those currently falling into the Medicaid coverage gap, have much to lose in terms of health, financial solvency, and overall wellbeing by opting out of Medicaid expansion. **DISCUSS OPPOSING VIEW AND/OR PRIOR SOLUTIONS**

Some states are adamantly opposed to Medicaid expansion. Reasons given for opting out include: state fears regarding a greater dependence on federal financial support, increases in taxes that some assert must be made to raise the additional capital to cover expansion, that expansion will broaden health coverage but provide those covered with few to no healthcare options or quality doctors, increases in the cost of private health care, and that it will

necessitate restrictions in other state-funded services, such as education, transportation, and in-state tuition.[11]

Medicaid expansion would require a bit of funding from states initially, but studies indicate that the long-term benefits, both financial and health-related, far outweigh the short-term costs.[7, 12] The Congressional Budget Office estimates that "the federal government will bear nearly 93 percent of the costs of the Medicaid expansion over its first nine years (2014-2022)...[which] represents a 2.8 percent increase in what…[states] would have spent on Medicaid from 2014 to 2022 in the absence of health reform..."[12] Moreover, this 2.8 percent increase in costs is "significantly *overstate[d]*," for it does not take into account the financial savings that will result from lowering the number of uninsured in these states.[12] For example, according to the Urban Institute, a D.C.-based public policy think tank, state financial savings generated as a result of more people being insured were all states to adopt Medicaid expansion "will total between $26 and $52 billion from 2014 through 2019."[12, 13]

Strategies that successfully have been employed in states that were resistant to adopting Medicaid expansion or who are at least seriously considering Medicaid expansion currently are grassroots organizing, unilateral executive actions, political compromise, and increasing individual participation. Grassroots organizations such as the non-profit Community Catalyst are fighting for the expansion of Medicaid coverage, even developing a "Medicaid Expansion Campaign Planning Guide."[14, 15] Unilateral executive actions have offered prior solutions for expanding Medicaid in Kentucky, in which Governor Steve Beshear mandated the creation of the Kentucky Health Benefit Exchange ("Kynect") and expansion of Medicaid through executive order in spite of opposition from the state legislature and court challenges to his authority to do so.[16] The programs have been deemed a success and are very popular.[17] Political compromise proved effective in Arkansas, where flexibility in the

implementation of Medicaid expansion clauses proved necessary in appeasing conservatives in order for the state to adopt expansion.[18] Finally, increasing enrollment or "take-up" among those eligible for Medicaid as soon as expansion is adopted by a state will ensure that the state will maximize the money it receives for coverage of the newly insured, who will no longer be utilizing costly uncompensated care.[19]

STATE GROUP POSITION

All 50 states should participate in Medicaid expansion. The benefits to expanding Medicaid far outweigh the costs, both financially and in terms of health outcomes. Many states opposed erroneously anticipate expanded Medicaid coverage causing a significant and unnecessary increase in taxes and costs; thus, the federal government should educate misinformed state legislatures and governors on what impact increased coverage will have on health and state financial solvency in the long term.

Texas is one state that is opposed to expanding Medicaid. In the Dallas region, property owners paid $467 million last year in taxes, a portion of which went to providing healthcare services at a local hospital that provides services to the indigent and uninsured.[8] If the state of
Texas expanded Medicaid, property owners likely would owe significantly less in taxes because the federal government would be providing money to cover the portion of these taxes that currently are being used for uncompensated care.[8] In addition, with more residents covered for medical services they otherwise cannot afford, there would be less emergency room usage for non-emergencies and more usage of preventative care.[20] People without insurance would be able to access primary care services and see a physician for regular check-ups, keeping them out of emergency rooms for routine care as well as preventing emergencies due to untreated conditions.

Expanding Medicaid will influence health and healthcare in myriad ways and some of the many examples of its benefits are provided here. First, more individuals covered under Medicaid will allow new mothers to have access to prenatal services. Women are more likely to utilize prenatal services if they are more accessible, and thus Medicaid expansion would likely yield more prenatal appointments.[21] Fewer missed appointments and increased education improves birth outcomes related to healthy birth weight.[21] Because most children are covered under parental insurance plans, improved children's health will inevitably follow with parental coverage.[22] In addition, with health insurance coverage comes peace of mind and security. If people are insured, they are less likely to declare bankruptcy or be forced to choose between paying medical bills and other important expenses such as food, rent or transportation.[23] Medicaid expansion has the potential to lead to an improvement in the self-reported or perceived health status of individuals.[23] Perhaps the most obvious benefit to expanding Medicaid coverage is the increase in the number of people who would have health insurance. It is estimated that an additional five million people will be covered.[2] Additionally, expanding insurance coverage will help individuals gain access to lifesaving medications they otherwise could not afford. For example, a person with HIV or AIDS would be able to receive antiretrovirals to help control

their viral load and symptoms.[24] Access to drugs and medications improves quality of life, as people feel more "in control" of their medical conditions and can reduce symptoms or interferences with daily life. Lastly, Medicaid expansion will inevitably increase demand for services. More medical staff and allied health professionals will be needed in the workforce to meet the need for services, potentially stimulating the economy.[20]

Increasing insurance coverage via the expansion of Medicaid services is not only necessary from a physical health and financial standpoint, but also from a moral viewpoint.[25]

For the most part, people would agree that it is morally correct to help those who are in need and those who have less. In almost every other developed country around the world, healthcare is a basic right, not a privilege.[25] If the United States expands Medicaid coverage, it will demonstrate an effort to adopt an increasingly moral, compassionate and caring culture.[26] According the
United Nation's Universal Declaration of Human Rights, health care is a basic right for all.[27] Medicaid expansion will bring the United States closer to upholding this ideal. Thus, for health-related, financial and moral reasons, states should nationally expand Medicaid coverage.

SUMMARY

The ultimate objective of the Affordable Care Act was to provide access to healthcare for all U.S. citizens. One of the ways in which this would have been accomplished was through the most extensive expansion in Medicaid eligibility since 1965. To date, only 29 states have adopted Medicaid expansion, but we have outlined fundamental educational and action tools that hopefully will propel the remaining states to embrace this initiative. Claims that expansion will result in economic burden is simply unfounded. On the contrary, it will serve as a much-needed financial boost for states, channeling billions of federal dollars into their economies and stimulating job growth in the health sector. The federal government will bear 100% of Medicaid expansion costs through 2020 and no less than 90 percent thereafter. Additionally, Medicaid expansion will result in $18.3 billion in savings through 2022 in uncompensated care costs, an expense that is currently being shouldered by state and local governments.[28] So then, allow us to pave the way for Medicaid expansion. The key question to ask is not, "Can we afford to?" but rather, "Can we afford not to?"

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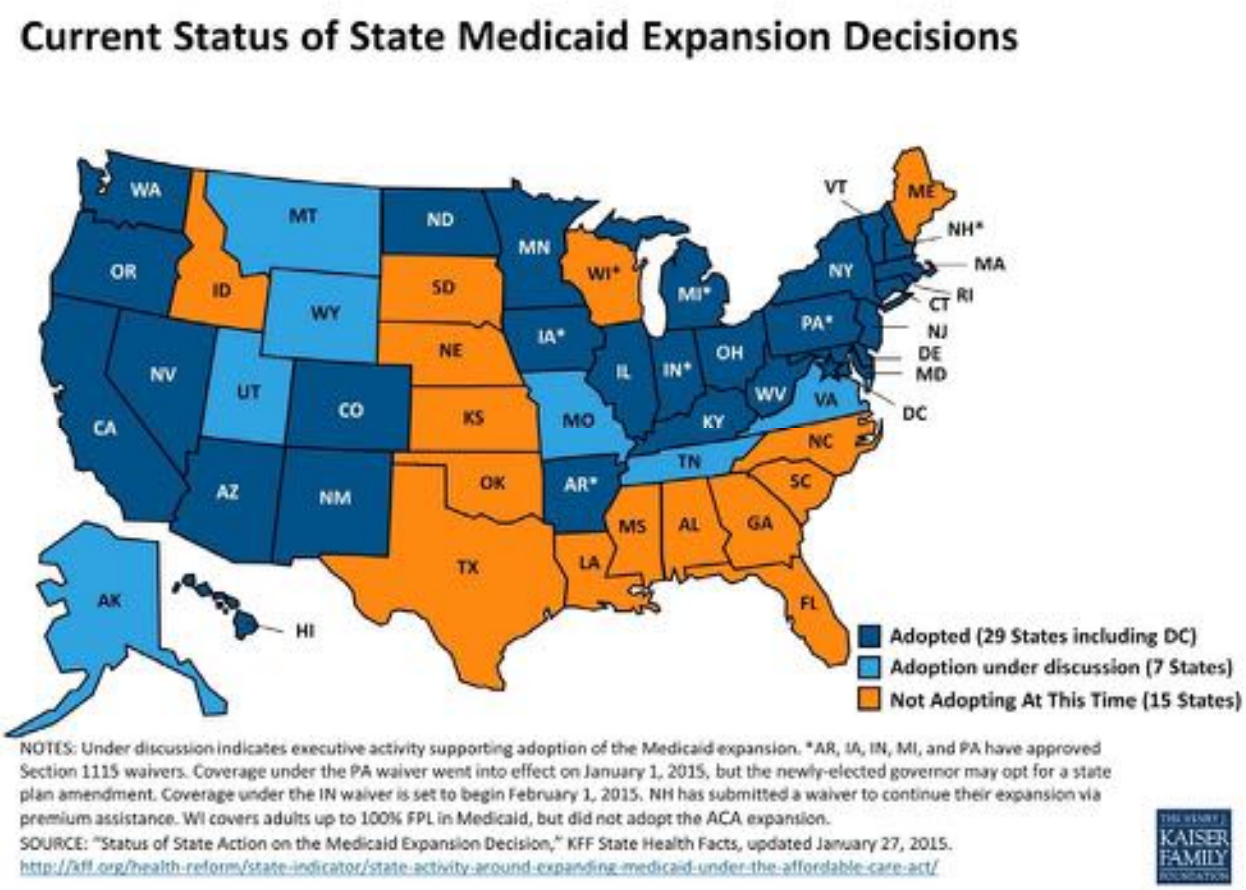

Figure 1: As of January 2015, 29 states have adopted Medicaid expansion, 15 states have rejected it, and seven states are still considering it.[29]

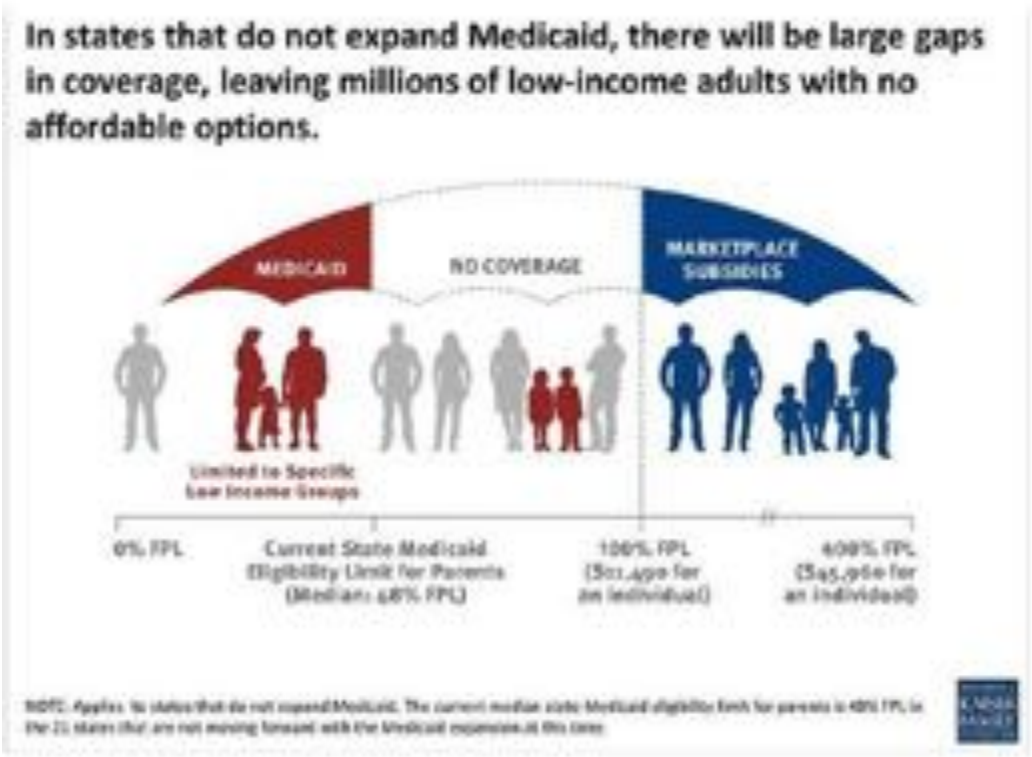

Figure 2: The coverage gap: states that do not participate in Medicaid expansion risk having insurance gaps for individuals and families, in addition to decreased access to healthcare.[30]

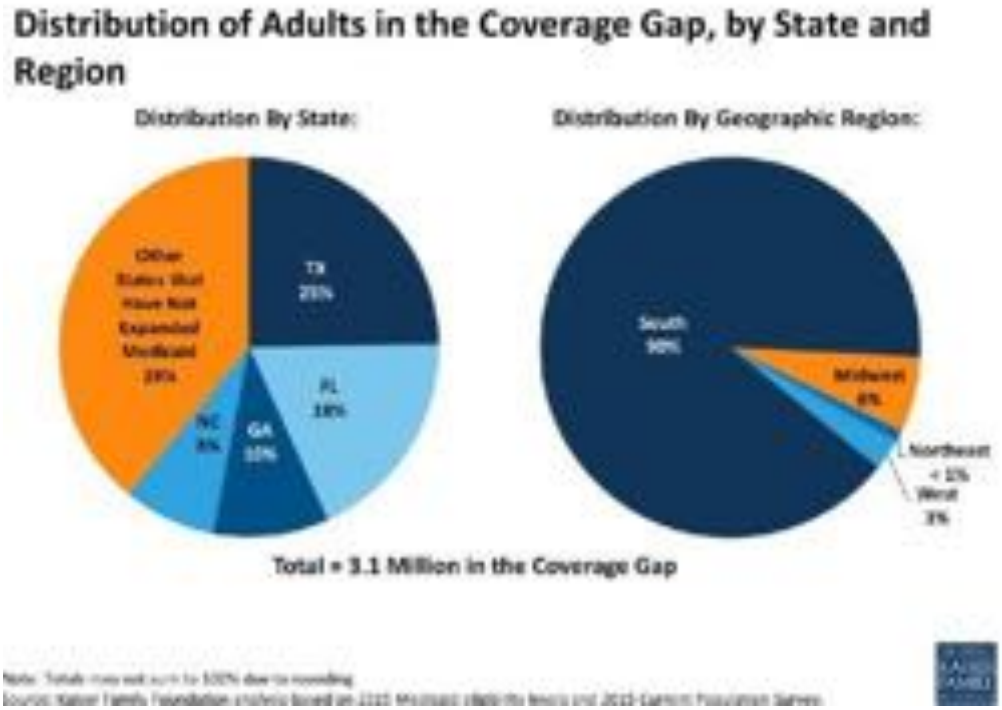

Figure 3: State and Regional Distributions of Population in Medicaid Coverage Gap[2]

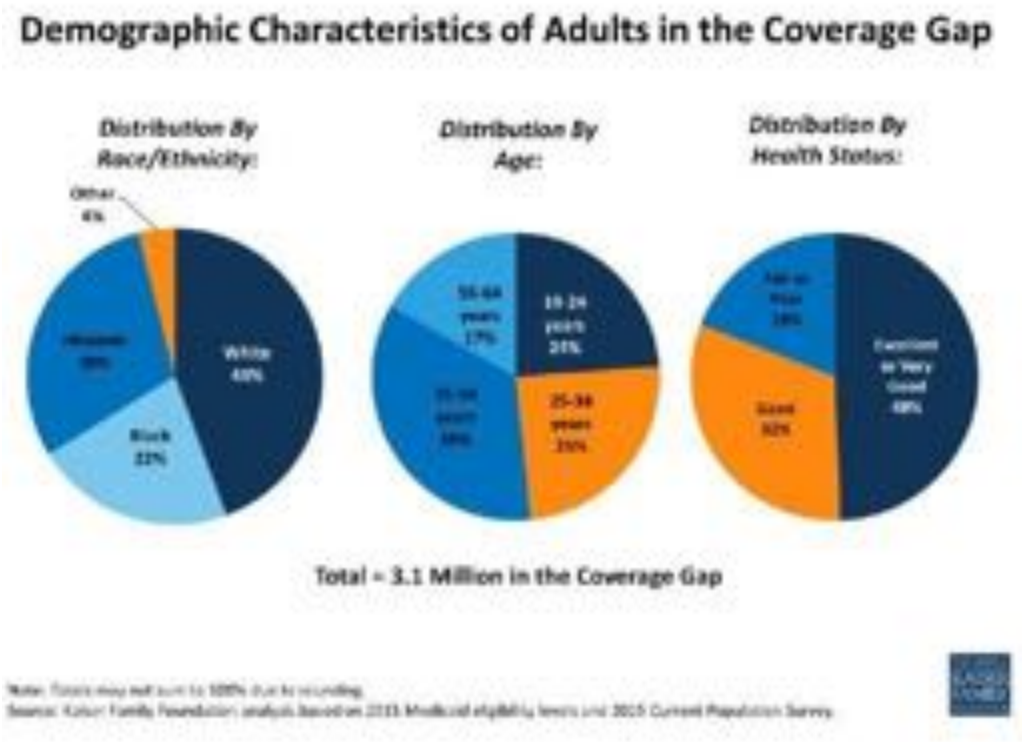

Figure 4: Distribution of Population in Medicaid Coverage Gap by Race/Ethnicity, Age, and Health Status[2]

Figure 5: Estimated Increases in State Medicaid Expenditures with Medicaid Expansion[7]

Estimated Medicaid Expenditures if Non-Expansion States Expanded Medicaid, 2015-2024

Cost in billions:



Source: Urban Institute Analysis based on HIPSM-ACS, 2015.

KAISER FAMILY FOUNDATION

Description: This rubric displays the grading criteria for the Congressional Testimony paper

	Novice	Competent	Proficient	
				Points: 2 (9.52%) Points Range: 1.6 (7.62%) - 2 (9.52%)
	Points Range: 0 (0%)	1 (4.76%) - Points Range: 1 (4.76%)	-Introduces group,	1.5 (7.14%)
Introduce your group	Barely introduces group.	Describes stakeholder status and expertise. Thanks the committee for the opportunity to present.		**Feedback:** Nicely done Points: 3.7 (17.62%) Points Range: 3 (14.29%) - 4 (19.05%)
	Points Range: 0 (0%) - Points Range: 2			Clearly states issue, groups position and summarizes
State the issue	1Does not clearly state the (4.76%) issue.	(9.52%) -Clearly states issue and group's position.	3 (14.29%)	recommendations at start of testimony. **Feedback:**
Provide background	Poorly organized, contains large chunks of facts that are simply facts/figures, discusses	Well organized. Documents issue with Well organized. Documents issue with		Not sure WHO the federal gov't would be communicating these points to. Points Range: 0 (0%) - Points Range: 2 Points: 4 (19.05%) 1 (4.76%) (9.52%) - 3 (14.29%) Points Range: 3 (14.29%) - 4 (19.05%) Points: 2.8 (13.33%) Points Range: 2

			.52%) - 3 (14.29%) Clearly states groups position with details. **Feedback:**
Points Range: 0 (0%) -	Your group's position	on HOW the federal	
State group position (4.76%)	1Does not clearly state the group's position.	gov't should get the states to participate is not detailed enough. It	
			seems like you want the federal gov't to engage in education/advocacy training directly with
	Novice	**Competent**	**Proficient**
	cut & paste from journal articles	who is affected by the issue. Describes why the issue is a problem generally.	facts/figures, discusses who is affected by the issue. Describes who is affected, what the health cost is and what the financial cost of the issue is to the U.S. Points: 3.8 (18.1%) Points Range: 3 (14.29%) - 4 (19.05%) Discusses opposing view/prior solutions in detail and describes why they did not work well. **Feedback:**
	Points Range: 0 (0%) - 1 (4.76%)	Points Range: 2 (9.52%) - 3 (14.29%)	
Discuss opposing view and/or prior solutions	Does not discuss opposing visolutions or only mentions them briefly.	Discusses opposing view is simply political. These are Republican and conservative states the populations of	Part of the opposing view/prior solutions in detail.

any 'success' to President Obama. Your other points are all valid and well describled.

Points Range: 3
(14.29%) - 4 (19.05%) Clearly states groups position with details. Provides facts/figures to support position.

	Novice	Competent	Proficient
	non-participating states. Points Range: 1.6	Points Range: 0 (0%) - Points: 1.5 (7.14%) Points Range: 1 (7.62%) -Clearly and succinctly summarize, in one 2 (9.52%)	
Summary	.9No summary or very general summary. (4.29%) (4.76%) -Summary with at least the problem and solution re-stated. 1.5 (7.14%) paragraph, the problem, the group's stakeholder status and the group's recommendations.		
	Points Range: -2 (-9.52%) - -1 (-4.76%)	Points: 0 (0%) Points Range: -1 (-	Points Range: 0 (0%) - 1 (4.76%)
Writing style	Poorly written. Does not flow well. Many 4.76%)Some issues with flow. - 0 (0%) Well written. Especially well written		
	grammar and/or spelling mistakes.	A few grammar and/or spelling mistakes.	papers will receive an extra point.

DOCTOR OF PUBLIC HEALTH (DPH) PROGRAM

Program Manual

August 2015

CUNY SCHOOL OF PUBLIC HEALTH

THE GRADUATE CENTER
CITY UNIVERSITY OF NEW YORK

HUNTER
The City University of New York

Brooklyn College

LEHMAN COLLEGE

The content of this Program Manual Supersedes that of all earlier Program Manuals

Note to Students and Faculty

This manual is designed to give Doctor of Public Health (DPH) Program students the information they need to successfully complete the doctoral degree and faculty the information they need to guide their students. The Graduate Center (GC) Student Handbook describes all relevant policies and is the official document for students at the GC. Students and faculty are encouraged to review that handbook as well as this manual and are expected to be familiar with all relevant GC and DPH policies.

Doctor of Public Health (DPH) Program- Administration

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Deputy Executive Officer (DEO)
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Health Policy and Management (HPM) Track Coordinator (TC)
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Registrar, Room 7201
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registrar@gc.cuny.edu

Security (ID Office): 212-817-7769

Student Affairs, Room 7301
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studentaffairs@gc.cuny.edu

The Office of International Students
Room 7200
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intstu@gc.cuny.edu

Help Desk /Information Technology
212-817-7300
Helpdesk@gc.cuny.edu

Office of Career Planning and Professional Development, Room 3300.30
212-817-7425
careerplan@gc.cuny.edu

Mina Rees Library
212-817-7077

DPH Program Research Librarian,
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ssmith4@gc.cuny.edu

Ombuds Office, Room: 3311
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Doctoral Students' Council (DSC)
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http://www.cunydsc.org/

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Edith Marie Gonzalez, Executive Director
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provost@gc.cuny.edu

David Olan, Room 8113.11
Interim Associate Provost and Dean for Academic Affairs
212-817-7205
dolan@gc.cuny.edu

Students with disabilities should contact the Student Affairs Office.

Students who are Veterans should contact the Registrar.

The GC Mothers' Room is open to all in the GC Community (students, faculty and staff with a current GC ID) to pump breast milk or to nurse. The CUNY Graduate Center Mothers' Room is located in Room 7408. To obtain a key, go to the Student Affairs Office in Room 7301. The GC Mothers' Room was initiated by DPH students!

Students who are parents or expected parents of children by birth or adoption under the age of six may contact the Student Affairs Office regarding the pilot of the Doctoral Student Parental Accommodation Policy.

CUNY School of Public Health

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7th & 8th Floors (Phone TBA)
sph.cuny.edu

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Doctor of Public Health (DPH) Program
Letter from the Executive Officer

Dear Students & Faculty:

I am pleased to present you with this updated DPH Program Manual for students and faculty in which we provide an overview of the DPH program and its requirements.

The CUNY DPH Program aims to:

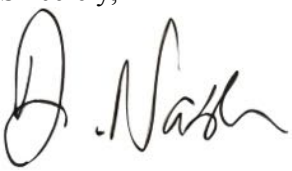
- Prepare public health researchers to rigorously generate and apply scientific evidence to improve the health of populations;
- Provide an interdisciplinary education in which graduates are capable of drawing on health-related theory and knowledge from multiple disciplines;
- Foster multilevel research and intervention - i.e., understanding and addressing public health issues at the individual, household, community, and policy levels; and
- Pay special attention to new and existing linkages between research, practice and policy with relevance to public health.

The mission of CUNY's DPH program is to:

- Prepare students to provide leadership in public health as researchers, managers, policy makers, advocates, and faculty in academic institutions;
- Contribute new knowledge to understanding the multi-level determinants of population health; and
- Assist communities, governments, and organizations to conduct research and interventions that promote health and prevent disease in populations.

The faculty and administration of the DPH Program work hard to ensure that the training and learning experiences of DPH students in our program are both challenging and rewarding. We want and need any help, suggestions, or feedback you can give us in order to realize our vision of a program dedicated to education leading to impactful research and action for public health. We look forward to working with you in this important phase of your training and career in public health!

Sincerely,



Denis Nash, PhD, MPH
Executive Officer, Doctor of Public Health Program, Graduate Center
Professor, Epidemiology and Biostatistics Program, Hunter College
City University of New York

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Overview of the Doctor of Public Health (DPH) Program and the City University of New York (CUNY)

The Doctor of Public Health (DPH) Program

The Doctor of Public Health (DPH) program at the Graduate Center (GC) prepares students to be researchers, teachers, practitioners, and managers who can meet the public health needs of populations, including the population of New York City and around the world. It prepares future faculty members for the growing number of academic training programs in public and community health, and it prepares leaders for the public health workforce.

Courses are taught by doctoral faculty from the Public Health Programs at Brooklyn, Hunter and Lehman Colleges and the Graduate Center. Additional DPH faculty are from other participating CUNY campuses. By drawing on faculty from throughout CUNY, the DPH program offers comprehensive interdisciplinary perspectives on public health and related fields.

The CUNY DPH Program carries out teaching, research and service to create and sustain population health and to promote equitable, efficient, evidence-based solutions to pressing population health problems around the world. Informed by the values of public health, social justice and democracy, the DPH Program seeks to become a platform for collaboration to:

- Examine the causes of and solutions to pressing health problems;
- Engage the public in an ongoing dialogue on public health policy;
- Develop a workforce with the capacity to plan and implement health-promoting programs and policies.

Several themes define the unique approaches that distinguish the CUNY DPH Program. These include a focus on:

- Multi-level analysis, research and intervention;
- Understanding and improving living conditions and health to reduce inequities;
- An interdisciplinary blend of public health and social, behavioral and natural sciences;
- Practice-based research;
- Collaboration with government agencies and public health institutions (e.g. DOHMH, DOE, HHC);
- Diversity -- CUNY programs, students, faculty.

Specialization Tracks

- Community, Society and Health
- Epidemiology
- Environmental and Occupational Health
- Health Policy and Management

Qualified applicants in any track may also apply to an optional concentration in Public Health Nutrition or Maternal, Child, Reproductive and Sexual Health (MCRSH).

The City University of New York (CUNY)

The City University of New York provides high-quality, accessible education for more than 269,000 degree-credit students and 247,000 adult, continuing and professional education students at 24 campuses across New York City.

CUNY School of Public Health

The CUNY School of Public Health is committed to teaching, research and service that creates a healthier New York City and helps promote equitable, efficient and evidence-based solutions to pressing population-based health problems around the world.

Employing the resources of the nation's largest and most diverse urban university, the CUNY School of Public Health seeks to create new models of public health education for the 21st century. The school's consortial campuses (the Graduate Center and Brooklyn, Hunter, and Lehman Colleges) bring together students and faculty from throughout CUNY's academic and professional programs, engaging with practitioners, researchers, activists, community residents and policymakers from many sectors of New York City.

Vision

Promoting health and social justice in New York City and across the globe through innovation and leadership.

Mission

The mission of The CUNY School of Public Health is to provide a collaborative and accessible environment for excellence in education, research, and service in public health, to promote and sustain healthier populations in New York City and around the world, and to shape policy and practice in public health for all.

The Graduate Center (GC), CUNY

The Graduate Center (GC) is the principal doctorate-granting institution of the City University of New York. Offering more than thirty doctoral degrees from Anthropology to Urban Education, and fostering globally significant research in a wide variety of centers and institutes, the GC provides rigorous academic training in the humanities, sciences, and social sciences.

Through its extensive public programs—lectures, conferences, performances, and exhibitions—the Graduate Center contributes to the intellectual and cultural life of New York City and affirms its commitment to the premise that knowledge is a public good.

Brooklyn College, CUNY

Brooklyn College currently serves more than 17,000 students in its undergraduate and graduate program. Founded in the 1930s, Brooklyn College is an integral part of the civic, urban and artistic energy of New York and uses the entire city as a living classroom that broadens our students' understanding of the world around them.

Hunter College, CUNY

Hunter College is the largest college in the City University of New York (CUNY). Founded in 1870, it is also one of the oldest public colleges in the country. More than 23,000 students currently attend Hunter, pursuing undergraduate and graduate degrees in more than 170 areas of study.

Lehman College, CUNY

With more than 60,000 alumni and 12,000 students, Lehman College serves the Bronx and surrounding region as an intellectual, economic, and cultural center. The College is named after Herbert H. Lehman, who was governor of New York State, a U.S. Senator, and an internationalist. His values of dedicated public service continue to guide the College today.

Other CUNY Units

Several other CUNY campuses including the Baruch School of Public Affairs, the Sophie Davis School of Biomedical Education at The City College of New York, and health programs at Queens College and elsewhere contribute faculty to the CUNY DPH program.

Doctor of Public Health (DPH) Program Governance
Summary

The DPH program operates under bylaws established by the program faculty and approved by the CUNY Board of Trustees. The governance structure of the program consists of a single Executive Officer (EO), a single Deputy Executive Officer (DEO), an Assistant Program Officer (APO) and four Track Coordinators (TCs). There are five standing committees which serve to govern the program: the Executive Committee, the Elections Committee, the Faculty Membership Committee, the Curriculum and Examinations Committee, and the Admission and Awards Committee. The DPH program is represented at the Graduate Center by membership in the Graduate Council and the Doctoral Student Council.

The Executive Officer, assisted by the DEO and APO, is responsible for overall administration and oversight of the academic affairs of the program in accordance with the policies established by the standing committees, the program faculty, the Graduate Council of the GC and the CUNY Board of Trustees. The EO reports to the Provost of the Graduate Center and the Dean of the CUNY School of Public Health.

The Track Coordinators are responsible for the day to day operations of the tracks (i.e., academic operations, faculty advising). The TCs report to the EO and DEO.
See the complete DPH Program Bylaws on Blackboard.

The Executive Committee: This is the main policy-making committee for the DPH program. It is chaired by the EO, and has as members: the four TCs, one faculty member with a primary appointment at the GC (unless the EO has one), one faculty member who is not from a consortium college, three DPH students elected by their peers, and additional faculty (where necessary) to ensure representation from all of the SPH consortial campuses not represented by the EO and TCs. The minutes from the meetings of this committee are available to the public.

The Elections Committee: This committee is responsible for coordinating and overseeing all DPH program elections (both committee and TC). It has five members: the EO, one elected faculty from each of the three consortial colleges not represented by the EO, and one student member.

The Faculty Membership Committee: This committee recommends faculty members to the Executive Committee for consideration for appointments to the DPH faculty and formulates procedures for making new faculty appointments. It has seven members: The EO, four faculty members (at least one from each concentration) and two students.

The Curriculum and Examinations Committee: This committee is responsible for reviewing curriculum and recommending changes and for recommending procedures and standards for the conduct of the first and second exams. It has seven members: the EO, one faculty member from each concentration, and two student members.

The Admissions and Awards Committee: This committee recommends to the Executive Committee procedures and standards of admission and awards for the program and the concentrations. It consists of eight members: the EO, the four TCs, a GC based faculty member and two student members.

DPH Participation in CUNY SPH Governance - Summary

The governing body of the CUNY SPH shall be the Faculty and Student Council (FSC). The Faculty and Student Council shall consist of the Dean, the Associate Dean for Academic Affairs, the Campus Directors, all Core Faculty, two affiliated faculty, two staff in the title series HEO or CLT, and five students (one elected from students in each of the consortial campuses, except that two are elected from Hunter College, one from the undergraduate program and one from the masters programs). The FSC meets three times per semester.

Elections for all vacant positions shall normally be held in May prior to the semester in which service begins.
The FSC is responsible for: formulating educational policy and developing standards for admissions, academic performance and degree requirements for students consistent with the by-laws and policies of the CUNY Board of Trustees and other CUNY policies and procedures; reviewing programs and curricula; recommending to the Dean and the CUNY Board of Trustees the granting of undergraduate degrees, graduate degrees and honorary degrees to qualified candidates; considering any other academic matters and making recommendations to the Dean and the CUNY Board of Trustees; establishing or abolishing such standing or temporary committees as it deems necessary and considering reports and recommendations of those committees; and recommending revisions to the SPH Governance Plan.
See the complete CUNY SPH Bylaws and Governance Change May 22nd 2013, both on Blackboard.

DPH Participation in GC Governance - Summary

The Graduate Council is the academic governing body of The Graduate School and University Center, and the Bylaws of Graduate Council set forth its rules of governance. Members include representatives of the faculty, doctoral students, and administration. The President of The Graduate Center is the Chair of Graduate Council. The Executive Committee of Graduate Council formulates the agenda and brings actions to Graduate Council, which meets four times each year. Graduate Council is concerned with such matters as curriculum, degree requirements, standards of admission, academic performance, and program governance. Much of the work of Graduate Council is done through its standing committees. Elections of faculty and student program representatives to Graduate Council are required to be conducted annually, before April 1, by an election committee in each program; the basic formula for the election is one faculty and one doctoral student representative for each hundred or fewer matriculated doctoral students (GC Bylaws 2.1A–D).
If a student is not elected as the Graduate Council representative, the Doctoral Student Council representative is the default.

Doctoral Students' Council (DSC) – Summary

The Doctoral Students' Council and its officers are charged with representing student interests before the administration and external bodies.

In addition to informal and ongoing communications, the DSC officers meet with members of Graduate Center administration to report activities and exchange information.
Students may have issues presented by their DSC representatives or the DSC Executive Committee before the Doctoral Students' Council, or can personally address the Council by requesting to be put on the DSC agenda for an upcoming meeting. This may, in turn, result in discussion or actions taken within the DSC or between the DSC and the administration.

The DSC members also act as advocates for graduate student interests at the Board of Trustees, University Student Senate, University Faculty Senate, New York State Assembly, the Mayor's Office, and with Graduate Center administration.
Each spring, the DSC conducts elections for its representatives and student representatives to specific Graduate Center bodies. The nominations and elections process is held online; no paper ballots are mailed.
To make a nomination(s) for Program Representative, Advocate Advisory Board, OpenCUNY Board, At-large Representative, the Disciplinary Panel, Student Academic Appeals Officer, and the Student Elections Review Committee, see page 78.

Satisfactory Progress, Academic Honesty, Registration, Levels, and Advising

Satisfactory Progress

The Graduate Center requires its faculty to assess each semester whether students are making satisfactory progress. Those who are not making such progress will be asked to develop a plan to correct any shortcomings or will be asked to leave the program.

A DPH student is deemed NOT to be making satisfactory progress if she or he:

1. Has completed 36 credits and not passed the First Examination;
2. Has a cumulative grade point average below 3.00;
3. Has not completed the Second Examination within 48 credits of matriculating;
4. Has not completed the degree in six years*;
5. Has accumulated more than two open grades ("INC," "INP," "NGR," "ABS," and "ABP");
6. For students that do not have an MPH degree, not having completed all five core Master's level public health courses prior to enrolling in the second year of coursework.

If a student is found not making satisfactory progress a hold will be put on their record. A "SatProg" report is generated by the GC Registrar Office and both the DPH program office and the student is informed of the reason for the hold. A plan is developed by the student, advisor, and TC. The EO is informed of the student's progress and that plan submitted by the EO to the Student Affairs Office. Upon approval of the plan by the Vice President of Student Affairs, it is then submitted to the Registrar and the hold is lifted.

*The summer semester is considered an additional semester. For example, if a student takes courses in the fall, spring, and summer semesters in one academic year, this is reported as three semesters in the total 12 semester (6 year) allotment to complete the degree.

Academic Honesty

The Graduate Center outlines a clear definition of Academic Honesty and the DPH program expects students to know and follow the CUNY Academic Integrity Policy. Both can be found in the GC Student Handbook as well as through this link to the GC Avoiding and Detecting Plagiarism guide.
http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf

Registration
DPH students can register only after the Tracking Form is completed by the student and approved by their Advisor, TC and the EO. Students are responsible for ensuring that the form is reviewed and signed (electronic or physically) by the Advisor and Track Coordinator.

If you plan to register for:

- A course at another CUNY school that is not co-listed with a DPH program course (i.e. does not have a PUBH prefix).
  Students must submit a Permit Out form to the APO. The Permit Out form can be found on the GC Registrar webpage. Please note that each CUNY college has its own rules for permitting in and that additional steps apply for permitting out for summer courses.

- A course in another program at the GC that is not open to DPH students.
  All GC courses can be found on the Dynamic Course Schedule. Students must contact the instructor and request permission to register for the course. Please be aware that GC Program's set their own policies. Depending on the Program, the override will be set by the instructor, the APO, or the EO. The DPH administrators cannot set overrides for courses outside of the DPH program.

- PUBH 807 Practicum Project
  Students must fill out the Practicum Project Application available on Blackboard. Please see pages 12-14 of this manual. Students can register only after the application is approved.

- PUBH 861 Independent Study
  Students must fill out the Independent Study Application available on Blackboard. Please see page 17 of this manual. Students can register using a faculty-specific CRN* only after the application is approved.

- PUBH 891 Advanced Research Seminar II
  Students must have defended their Second Exam or have permission from the instructor and have the Second Exam defense scheduled within the first two weeks of the semester. Students must successfully defend the Second Exam to continue the course past the first two weeks of the semester. Please see pages 15, 39-46 of this manual.

- PUBH 900 Dissertation Supervision
  Students must inform the APO which faculty member you intend to study with. The APO will reply to you with a CRN* number. Please see pages 16, 47-70.

At this time, DPH students can register for Inter-University Doctoral Consortium courses, but can only register for courses listed or cross-listed within any of the consortium Graduate School of Arts and Sciences (GSAS). Please read the section Inter-University Doctoral Consortium in the GC Student Handbook for additional details. Fill out the Consortium Permit Out form and submit it to the APO for the EO's signature. The APO will then submit it to the Vice President for Student Affairs for approval.

*identifies a particular course and section offered for the semester.

Semester Course Schedules
Prior to each semester's registration period, the DPH program will distribute and post on Blackboard the DPH schedule that contains DPH course listings, suggested courses in other programs, and processes for registering.

The GC Dynamic Schedule is updated live by the GC Registrar.
https://ssb.gc.cuny.edu/prod/plsql/bwckschd.p_disp_dyn_sched

The DPH website is periodically updated with semester course listings.
http://www.gc.cuny.edu/Page-Elements/Academics-Research-Centers-Initiatives/Doctoral-Programs/Public-Health-DPH/Courses---Curriculum

Graduate Center Registrar
Refer to the GC Registrar webpage for Course Listings and Schedule, Academic Calendars, GC Publications (GC Bulletin; Student Handbook), and important downloadable forms.
http://www.gc.cuny.edu/Prospective-Current-Students/Current-Students/Registration

Curriculum Changes Over Time
Students should refer to the GC Bulletin or pages 9-29 for the requirements by their year admitted. Hard copies of previous year's Bulletins are available in the Library and Registrar's office. However, if the change is more rigorous, then the student is grandfathered into the previous curriculum. If the change is less rigorous, it overrides the previous curriculum. Finally, if a student left the program and was readmitted (not including formal leaves of absence) the Bulletin from when the student is readmitted is the one they should follow.

Status
All students are required to be in status each semester. This means that students must either be registered or be on an approved leave of absence. Individuals who are not in status will be considered withdrawn from the Graduate Center and an application for remittance must be submitted.
http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Forms/Readmission.pdf?ext=.pdf

Levels II and III
DPH students reach Level II after passing the completion of 45 credits and passing the First Exam. Tuition and status is atomically changed to full-time.

DPH students can request to be Advanced to Candidacy to Level III at the completion of all coursework (at least 48 credits) and passing the First and Second Exams and successfully defend their dissertation proposal. A student does not apply to be advanced to Level III and it is not "automatic." It is an online form that is submitted by the APO or EO and requires communication with the student. Once a student reaches the criteria noted, and if not flagged by either the Sponsor or Registrar, the student should contact the APO or EO and request to be advanced. The student should confirm the following: tentative or actual dissertation title; committee members and their roles; date of successful dissertation proposal defense, and the tentative or actual defense and deposit dates. Students must be advanced before deposit. Once a student is advanced, no changes can be made to the transcript. At this time, if the student has not had the Human Participants Clearance form submitted and processed (see page 51, dissertation proposal) the student will be asked to proceed with that process at advancement.

After advancement, tuition is atomically changed to full-time status and at a reduced tuition rate.

Waiving out of a DPH Program Course
With approval of the Advisor/Sponsor, Track Coordinator and Executive Officer a student may request to be waived from a DPH program course. If a course is waived, the student must replace the equal amount of credits with another course as approved by their advisor. For example, if a student took an advanced Masters level Epidemiology course deemed equivalent to PUBH 820 Epidemiologic Methods I, that student may be waived from PUBH 820 and will need to take a three-credit course in its place. Usual procedures for course waiver are to present a course description of the course taken elsewhere and the transcript noting the grade received or to pass an examination based on the course.

Weighted Instructional Units
Weighted Instructional Units (WIUs) are used to document that graduate study extends beyond traditional classroom learning. They do not have credit value but are a mechanism to recognize non-classroom academic work involved in earning a graduate degree. As such, they are used in calculations to determine if a student may be certified as having full-time status at The Graduate Center. They are typically used for more advanced students who have completed their coursework and are at the First Exam stage or beyond. Semester-specific WIU registration CRNs are distributed by the Registrar and the APO before each registration period. Students should register for 7 WIUs if full time status is necessary.

Faculty Advisors
A faculty advisor guides the student though the DPH coursework, completion of the first exam, and application for the second exam. Track Coordinators assign advisors before or during the student's first semester in the program. Advisors can also help students to develop dissertation ideas and suggest faculty who can serve as members of the Second Exam and dissertation committees. The faculty advisor may or may not serve as the student's second exam or dissertation sponsor.

The advisor will communicate with students to discuss course planning, academic issues, and career guidance. Advisors are also responsible for helping students make satisfactory academic progress towards their degree. Students are expected to communicate with their advisors at least twice a semester and more often as needed. Within the first year of coursework, students should discuss possible dissertation topics and research questions with their advisor, as well as potential faculty sponsors for the student's dissertation research.
Each semester the student will submit an electronic tracking form (on Blackboard) to their advisor for course selection approval. Students are responsible for ensuring that the form is reviewed and signed (electronic or physically).

Either a doctoral program faculty member or a student can request a change of advisor by discussing the request with the Track Coordinator, who must approve the change.

Coursework in the DPH Program

Credits

The DPH curriculum consists of 48 post-master's degree credits (note: the DPH Program is in the process of applying for approvals of a reduction in the number of credits associated with the dissertation of 12 to 0, for a total of 48. This manual reflects that change. If this change is not approved, an announcement will be made and an amendment to this manual will be posted on Blackboard). Students can take up to 6 credits within the CUNY SPH Master's in Public Health (MPH) Programs or other Master's level programs throughout CUNY. Students may also take up to 6 Independent Study credits at the Graduate Center. With the permission of their advisor and the EO, students may transfer in a certain amount (in general, no more than 12) of doctoral-level credits from other doctoral degree programs. For students who are waived out of a course, the same number of credits must be taken to replace the waived course. The degree must be completed within six years of matriculation or will be considered not making Satisfactory Progress, see page 5.

Students Without an MPH Degree

DPH students who do not have a Master's in Public Health (MPH) degree must have the five core MPH courses that are required by the CUNY SPH MPH programs completed by the end of their first year of enrollment. The five master's level courses are:

- Introductory Biostatistics
- Introductory Epidemiology
- Environmental Health
- Social and Behavioral Dimensions of Health
- Health Policy and Management

Three of the 5 prerequisite courses must be completed prior to acceptance into the DPH program. None of these credits will count toward the doctoral degree even if the remaining two master's-level courses are taken while matriculated in the DPH program. It is the responsibility of the student, in consultation with his/her Advisor and Track Coordinator, to ensure that remaining core MPH courses are completed within the first year of enrollment. Failure to do so will be considered not making Satisfactory Progress (see page 5) toward to degree and will interfere with the academic progress of the student.

Coursework and Curriculum

In keeping with the interdisciplinary focus of the DPH program, all students are required to take public health courses within a specialization area, additional courses in research methods, theory or public health practice, and at least one doctoral course outside of public health. Course selection is determined through consultation between the student and the advisor. If a DPH course is cross-listed with another GC program, that course can count toward the interdisciplinary requirement.

Students are required to complete the core DPH courses, track-specific course requirements, advanced research seminars and dissertation research.

Overview of Required Courses for all DPH Students

Requirements for all DPH students:	
PUBH 800	Cities, Society, and Health
PUBH 801	Interdisciplinary Approaches to Urban Health Research
PUBH 805/802 (EPI take PUBH 824)	Quantitative Research Methods with Applications to Urban Health
PUBH 806 (2012 and following cohorts)	Qualitative Research Methods with Application to Urban Health
PUBH 893	Leadership & Organizational Change Seminar
PUBH 807	Practicum Project
PUBH 820	Epidemiologic Methods I
PUBH 890	Advanced Research Seminar I
PUBH 891	Advanced Research Seminar II
PUBH 900	Dissertation Supervision
PUBH 898	Dissertation Seminar

Core Courses

PUBH 800 Cities, Society, and Health (3 credits): This course presents an ecological, multilevel approach to the study of urban health and brings together public health and social science disciplines to examine the impact of city living on population health.

- *Required for all cohorts, all tracks*

PUBH 801 Interdisciplinary Approaches to Urban Health Research (3 credits): This course prepares students to investigate causes and solutions to complex urban health problems by bringing together concepts, theories and methods from a variety of disciplines that contribute to our understanding of urban health. It also focuses on research that contributes to reducing health disparities and promoting well-being in urban communities.

- *Required for all cohorts, all tracks*
- *Prerequisite: PUBH 800*

PUBH 805 Quantitative Research Methods with Applications to Urban Health (3 credits): This course will introduce students to intermediate level approaches and applications in conducting quantitative research in urban public health. It follows introductory biostatistics and epidemiology courses. Course objectives include understanding the assumptions, application, and interpretation of generalized linear regression models, including linear, logistic, Poisson, and proportional hazards models; understanding standard methods for making inferences on model parameters, including Wald testing and ratio testing; and being able to fit generalized linear regression models and diagnose the appropriateness of models using standard statistical software. Particular attention will be made to choosing and defining the right outcome(s), given specific research questions and available data; defining appropriate comparison groups; and understanding the assumptions of each model in order to make appropriate choices and analytic decisions for different types of data and research questions common to urban health research. Labs will allow students to practice these new skills. The final examination will include a project in which students develop and carry out an analysis of an urban health research question using a publically accessible dataset.

- *Required for all cohorts in CSH, EOH, and HPM tracks. For EPI students PUBH 824 Applied Biostatistics should be taken in its place*
- *For cohorts preceding 2012, this course should be used to meet the prior requirement for PUBH 802 Advanced Methods & Ethical Issues in Urban Health Research*
- *Prerequisite or Co-requisite: 820 Epidemiologic Methods I or equivalent*

PUBH 806 Qualitative Research Methods with Application to Urban Health (3 credits): This course will introduce students to approaches in designing and conducting qualitative research in topics of relevance to public health. It is intended to provide doctoral students with a foundation in the various qualitative data collection and analysis methods, focusing on their application to public health practice and research. It will cover elements of qualitative research design, data collection, analysis, and writing for publication. This will be integrated with the main assignment in which students develop a proposal for a qualitative research project tailored to address a specific public health research question.

- *Required for the 2012 and following cohorts*

PUBH 807 Practicum Project(3 credits) (Pass/Fail): The DPH Practicum Project is a planned, supervised and evaluated experience that allows students to apply the knowledge and skills that they have acquired through learning experiences in a practice setting. The DPH Practicum Project requires 180 practicum hours that can be completed in a range of organizations across New York City or elsewhere. Students must document how the 180 practicum hours are spent. The student must complete a detailed learning plan, a summary report (that includes objectives), a self-evaluation, and a final report. It is the belief of the DPH Program and the CUNY School of Public Health that there is always a new topical, methodological, or positional approach that will allow students to gain new experience or skills or benefit from the additional practical experience. Therefore, the Practicum Project requirement cannot be waived, as even students with extensive experience in public health practice and leadership can benefit from applied public health experiences that they have not yet encountered in their careers.

A Practicum Project requires a Practicum Sponsor. A Practicum Sponsor is usually not a DPH faculty member, nor faculty of another academic organization, because the Practicum Project is meant to be action-oriented, leading to public health action. However, the proposed Practicum Project may meet this criterion if it involves collaboration between the CUNY SPH or another academic organization and an external, non-academic organization, with the express purpose of producing work that generates public health action.

Before the student registers, the PUBH 807 Practicum Project Application must be approved by the Practicum Sponsor and the Course Instructor (on Blackboard).

The content of Practicum Projects must be related to public health action and be practice-oriented. A Practicum Project can include any aspect of public health practice, including leadership, practice-based research or evaluation, dissemination, primary data collection, data management, data analysis, manuscript/report preparation, policy development or analysis, community-based or organizational capacity building in public health, conducting a systematic literature review, designing data collection instruments, developing research/evaluation/intervention protocols, and developing grant proposals. While any of this work can be part of a project team, the work that is specifically being conducted by the student and the student contribution to the project (over and above those of others on the project team) must be clearly delineated and approved by the Practicum Sponsor. See the Frequently Asked Questions on the next page.

The student will develop a detailed learning/work plan that includes the hours/dates associated with all activities, project objectives, a description of activities, and a description of the final product and how it will be assessed. This will be reviewed and approved by the Practicum Sponsor and will be used to evaluate the student at the end of the project. The student meets with the Practicum Project Sponsor weekly. The final assessment will be based primarily on the final practicum report, which must document the achievement of each of the project objectives. Each must include a detailed self-evaluation, a summary of the project activities and how the project objectives were met. The Practicum Sponsor must evaluate the final project and assign a pass/fail grade (where fail is less than 70%). The final Practicum Project grade will be determined by this grade in combination with grades given by the Course Instructor for three other submissions completed over the Project period: Detailed Learning Plan (15%), Progress Report (10%), Final Report (60%), Self-evaluation/Reflection (15%). The Course Instructor assigns the final grade.

- *Required for all cohorts, all tracks**
- *Approval of Application by Practicum Sponsor and Course Director*
- *Prerequisites: PUBH 800;PUBH 801*

PUBH 807 Practicum Project- Frequently Asked Questions

How many practicum hours must the DPH Practicum Project be to fulfill the program requirement? Am I required to complete these hours on a full-time working basis, or can they be spread out over time?

- Students must complete 180 hours on the DPH Practicum Project to fulfill the program requirement, but these hours may be spread out over the days and weeks of the semester.

What if I am unable to complete my DPH Practicum Project in one semester – can I take an Incomplete in the course, and complete it during the following semester?

- While the program discourages students from taking Incompletes, under some circumstances, an Incomplete may be the only option. For example, when a student's project work requires a longer period of time than the academic semester, or a different period of time, which extends into the next semester. This situation may arise due to the nature of the project or because of the practicum sponsor organization's timeline. A request for an Incomplete must be approved by the Course Instructor, and the incomplete grade must be resolved by the end of the subsequent semester.

I've worked in the public health field for many years, including in leadership positions, on many health issues, and across public and private sectors. Can I waive the DPH Practicum Project requirement and receive equivalent credit for my professional experience?

No. The DPH Practicum Project requirement may not be waived under any circumstance. It is the belief of the Program and the CUNY School of Public Health that there is always a new topical, methodological, or positional approach that will allow students to gain new experience or skills or benefit from the additional practical experience.

I already consider myself a public health professional. What are the goals of the DPH Practicum Project? What is the additional expertise or experience I'm expected to gain from this program requirement?

- The DPH Practicum Project is intended to provide students with real world experience in public health practice. Students should plan a Practicum Project in an area in which they do not have extensive experience in order to gain new skills and experience. This could take many forms, but must provide an application of public health knowledge and skills, and be action-oriented, i.e., work that leads to public health action. For example, students could work on designing or implementing a program, writing a grant, promoting an idea or policy via a report or a set of targeted papers or a series of policy briefs, etc.

Can I complete the DPH Practicum Project by doing research work with a faculty member at CUNY SPH or a faculty member at another academic institution?

- The main requirement for the DPH Practicum Project is that it must be conducted at or in collaboration with an external non-academic organization engaged in or with a mission of public health practice. The Practicum Sponsor for the DPH Practicum Project may be based at an academic organization, including CUNY SPH, but the work must be conducted in partnership with the external non-academic organization.

If I've identified an organization where I would like to complete my DPH Practicum Project, can I just tell them what I want to do there? What role do they have to play in the development and design of my project?

- Students must work collaboratively with the potential practicum sponsor organization to design and develop their DPH Practicum Project in accordance with the expectations of the DPH program. The work of the DPH Practicum Project must be linked to the practice mission of the practicum sponsor organization, including if it is an academic partnership, and oriented to develop the goals and objectives of that work.

What are the DPH Practicum Project criteria?

- First, the Practicum Project must be clearly oriented towards public health practice; the learning/work plan for the proposed Project must clearly reflect how it will contribute to public health action. Second, the Practicum Project must be directly linked to the mission, goals, and objectives of the practicum sponsor organization. Third, the Practicum Project must be conducted at or in collaboration with an external non-academic organization; an academic partnership, with CUNY SPH or some other academic organization, is acceptable, as long as the work is shaped by a practice orientation, rather than research.

Can I conduct research and write a paper for publication in the peer-reviewed literature as my DPH Practicum Project?

- Research and writing for publication alone do not meet the core expectations for the DPH Practicum Project. While these activities may be involved or even central, student practicum work must involve more than the generation and/or synthesis of knowledge. For example, a systematic literature review would be acceptable if it was linked to a public health practice goal of the practicum sponsor organization, such as if the review would be presented as evidence for the need to develop or modify a particular public health-related policy or intervention. As noted above, the Project must involve work that leads to public health action.

** Students in the 2013 and preceding cohorts who have not completed the Leadership Project may do so by registering for the PUBH 807 Practicum Project. Depending on cohort requirements (2012 and 2013 Cohorts: PUBH 89201 and 02 Leadership Project; 2011 and Preceding Cohorts: PUBH 89201 and 02 Leadership Project & a 3 credit leadership elective) this option will require replacing credits (3 or 6) with additional course(s).*

PUBH 820 Epidemiologic Methods I Research Design and Inference (3 credits): This course provides an intermediate-level understanding of the design and conduct of epidemiologic studies, including causal inference, measurement, major study designs, threats to validity, and their application to public health issues. The class includes lectures on research methods, hands-on data analysis exercises, discussions about determining causation through epidemiological research.

- *Required for all cohorts, all tracks*

PUBH 893 Leadership & Organizational Change Seminar (3 credits): The Public Health Leadership Seminar introduces students to theories and models of leadership and organizational change and helps students to analyze their own strengths and weaknesses as leaders. Using a case study approach, students analyze successful and unsuccessful examples of public health leadership and organizational change.

- *Required for all cohorts, all tracks*
- *Prerequisite: PUBH 800;PUBH 801*

Research and Dissertation Seminars

All students are required to complete an original dissertation research project. For a full explanation of this process, see pages 47-70 for Dissertation Guidelines. To prepare for the dissertation, students take two research seminars, the first within the second year of coursework (PUBH 890) and the second after completing all required courses (PUBH 891). While students are writing the dissertation, they register for PUBH 900 Dissertation Supervision and PUBH 898 Dissertation Seminar.

PUBH 890 Advanced Research Seminar I (3 credits): Students develop specific research questions pertaining to potential areas of interest for their doctoral dissertations and prepare a proposal that specifies a research question, a public health rationale for the study and an appropriate research design and methods. Students will be expected to complete a literature review and design a study, which may later lead to a dissertation proposal.

- *Required for all cohorts, all tracks*
- *Prerequisites: PUBH 800; PUBH 801*

PUBH 891 Advanced Research Seminar II (3 credits): Guides advanced students in the completion of their dissertation proposal and, if needed, Institutional Review Board (IRB) application for dissertation research. Faculty assist students to refine the research design, to fully develop appropriate research methods and analytic strategies and to provide protection for human subjects in their dissertation research. In order to take PUBH 891 Research Seminar II, students need to have defended the Second Exam or have permission of the instructor and have the Second Exam defense scheduled within the first two weeks of the semester. Students must successfully defend the Second Exam within the first two weeks of the semester in order to remain in the course.

As part of PUBH 891 students are required to complete and submit The Dissertation Progress Report.

The online component of CUNY's Responsible Conduct of Research (RCR) is a required part of this course. DPH students will be exempt from the in-person workshop of CUNY's RCR.

- *Required for all cohorts, all tracks*
- *Prerequisites: All other coursework; successful defense of the Second Exam*

PUBH 898 Dissertation Seminar (0 credits): This is a non-credit required course that students must take every semester they are working on the dissertation and registered for PUBH 900. The dissertation seminar meets up to four times a semester and serves as a workshop in which students attend Public Health Grand Rounds, present and discuss their dissertation research, and review aspects of each other's work (peer review).
The student must be registered for this course number in the same or preceding semester the student deposits the dissertation. After the student is advanced to candidacy, this course number will appear as audit on the transcript. See pages 47-70.

- *Required for all cohorts, all tracks*
- *Prerequisites: All coursework and exams*
- *Taken only while working on the dissertation and registered for PUBH 900*

PUBH 900 Dissertation Supervision (0 credits): Students pursue doctoral research leading to the required dissertation under the supervision of their dissertation sponsor. Doctoral faculty provide supervision on research design, data management and analysis, presentation and interpretation of findings.
The student must be registered for this course number in the same or preceding semester the student deposits thee dissertation. After the student is advanced to candidacy, this course number will appear as audit on the transcript. See pages 47-70.

Grades of NRP (No Record of Progress) or SP (Satisfactory Progress) will appear when the student is enrolled and will change to P when the student graduates.

- *Required for all cohorts, all tracks*
- *Prerequisites: All coursework and exams*
- *Taken only while working on the dissertation and registered for PUBH 898*

Examinations

Students in all cohorts and all tracks take two examinations to test their mastery of the curriculum. Students must apply in advance to take each exam and students must be in good academic standing to apply. The First Exam is given after students have completed core coursework. Students work on the Second Exam after all required coursework has been completed except PUBH 891 and the dissertation (PUBH 900 & PUBH 898). Students cannot take PUBH 891 or begin their dissertation research until they have passed this exam. See pages 37-46 for more details on the First and Second Examinations.

Topics Courses and Independent Study

PUBH 851 Topics in Public Health (1-3 credits): All provisional DPH electives are listed with the number PUBH 851. A provisional elective may run a total of three semesters, after which it must be approved by the Curriculum Committee and FSC and assigned a permanent course number.

PUBH 861 Independent Study (1-3): Students may work with a DPH faculty member sponsor on an independent study project ranging from 1-3 credits. A total of 6 independent study credits may be used toward the degree. A faculty member may not be on sabbatical while acting as an independent study sponsor. Faculty outside of the DPH program cannot sponsor an independent study, nor can adjunct faculty. Independent study can only be registered for during the regular academic year. As a guide, a one credit independent study should correspond to about 45 hours of work (3 hours per week X 15 weeks), a two credit independent study should correspond to about 90 hours of work (6 hours per week X 15 weeks), and a three credit independent study should correspond to about 135 hours of work (9 hours per week X 15 weeks). Applications for Independent Study can be found on Blackboard.

The sponsoring faculty member and student must have a one-page independent study proposal approved by the student's advisor and TC. The proposal must include learning objectives, milestones, evaluation criteria, and a timeline with a final evaluation by the sponsoring faculty member.

Community, Society, and Health (CSH)

This track prepares researchers and public health practitioners to advance scientific understanding of the social determinants of health, health behaviors, the delivery of health services, and the development of sound health policies. CSH graduates will be able to lead, plan, manage, and evaluate community health interventions. The track draws on the methods and theories from multiple disciplines to prepare students to design and implement public health programs and research/evaluation studies.

The CSH Track prepares researchers and public health practitioners who can:

- Advance scientific understanding of the social determinants of health, health behaviors, the delivery of health services, and the development of sound health policies.
- Lead, design, manage, and evaluate community health interventions.
- Draw on the methods and theories from multiple disciplines to design and implement research studies on population health.
- Formulate, analyze and advocate for policies that promote health and prevent disease.
- Teach students and professionals about the social determinants of health, health behaviors, health interventions, health policy, and health disparities.

Curriculum:
The core curriculum in CSH includes courses on social dimensions of health theories and research methodology. Electives are chosen in consultation with the faculty advisor.

Requirements for all CSH students:	
PUBH 810	Community Health Interventions: Theory and Methods
PUBH 811	Social and Behavioral Dimensions of Health: Theory and Methods
PUBH 816 (2012 and following cohorts)	Evaluation of Public Health Programs and Policies
Plus, cohorts preceding 2012:	
Five electives in research methods or public health practice, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement), one leadership elective, Public Health or MPH courses on population or health problem specific issues; one elective course on social aspects of health in sociology, psychology, anthropology or related fields; and two research methods courses.	
Plus, cohorts 2012 & 2013	
Three advanced research methods or track-specific practice courses, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement).	
Plus, cohort 2014 and following	
Four advanced research methods or track-specific practice courses, of which one must be from a Graduate Center department outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement).	

PUBH 811 Social and Behavioral Dimensions of Health: Theory and Methods (3 credits): This course prepares students to understand the impact of social structures and social environments on health and health behavior. Using an interdisciplinary approach, the course examines the contributions of sociology, anthropology, economics, psychology, history and political science to the study of health and health behavior.

• *Required for all CSH students*

PUBH 810 Community Health Interventions: Theory and Methods (3 credits): This course prepares students to lead research/intervention teams that plan, implement and evaluate community health interventions in community settings**.**

- *Required for all CSH students*
- *Prerequisite or co-requisite: PUBH 811*
- *At least two Master's level courses in program development or evaluation and at least one year of work experience in community health settings. These requirements can be waived with permission of instructor for students who bring other relevant experiences to the course.*

PUBH 816 Evaluation of Public Health Programs and Policies (3 credits): Prepares students to design evaluations of public health programs and policies; uses a systems approach to identify key constituencies and tasks in evaluation; students design an evaluation of an existing program or policy.

- *Required for the 2012 cohort and following cohorts*
- *For cohorts preceding 2012, this course can be used toward an elective requirement. Please check with your advisor.*

Epidemiology (EPI)

The mission of the Epidemiology Track of the DPH Program is to train epidemiologists as researchers and public health practitioners with a set of core competencies making them capable of rigorously applying epidemiological and biostatistical methods to the wide array of public health challenges. This includes the ability to: authoritatively generate, contribute, and disseminate new knowledge to their fields through research; to be critical consumers of evidence generated by others in their field; and to become independent, lifelong learners in development and application of epidemiologic methods. This mission is achieved through the teaching of epidemiologic methods and their applications to pressing public health problems, promotion of independent learning, and hands-on mentoring of rigorous, impactful and innovative epidemiologic research in the dissertation phase.

Curriculum:
The core curriculum in EPI includes coursework in epidemiologic methods and statistical methods. Electives are chosen in consultation with the faculty advisor.

Requirements for all EPI students:	
PUBH 821	Epidemiologic Methods II: Study Design and Analysis
PUBH 822	Epidemiologic Methods III: Seminar in Epidemiologic Methods
PUBH 823	Epidemiologic Methods IV: Seminar in applications of epidemiologic methods to urban health
PUBH 824 (required for the 2014 cohort and following)	Applied Biostatistics I
PUBH 825 (required for the 2014 cohort and following)	Applied Biostatistics II
Plus, cohorts preceding 2012:	
Four electives, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement), one leadership elective, two in statistical methods and one elective in a specific content area, 2 electives, GC or Public Health courses in statistics, one of which can be a course in a software package and one in population or health-issue specific; and one elective course on statistics in sociology, psychology, or other related fields.	
Plus, cohorts 2012 and following	
Three advanced research methods or track-specific practice courses, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement).	

PUBH 821 Epidemiologic Methods II: Study Design and Analysis (3 credits): Through lectures and problem-solving workshops, this course broadens the approach to epidemiologic methods, incorporating principles from Methods I into the design and conduct of studies and analysis of epidemiologic data. It consists of lectures and problem-solving workshops.

- *Required for all EPI students*
- *Prerequisite: PUBH 820 or equivalent or permission of track coordinator*

PUBH 822 Epidemiologic Methods III: **Seminar in Epidemiologic Methods (3 credits):** This seminar exposes students to emerging concepts and methods in epidemiologic research and provides students with an opportunity to apply new methods and consider how these strategies complement, and advance the more commonly used strategies in epidemiology.

- *Required for all EPI students*
- *Prerequisite: PUBH 821*

PUBH 823 Epidemiologic Methods IV: **Seminar in applications of epidemiologic methods (3 credits):** This seminar is intended to help students integrate the concepts and methods of epidemiologic research with specific inquiry directed at understanding, and improving the health of populations. This seminar requires students to develop proposals for epidemiologic research, identify strategies for data analysis that incorporate the lessons learned in Methods courses I, II, and III and to examine the application of those strategies to existing research. This course helps "bring together" the epidemiology theory and methods that have been discussed throughout the rest of the curriculum to the particular exigencies of public health research.

- *Required for all EPI students*
- *Prerequisite: PUBH 822*

PUBH 824 Applied Biostatistics I (3 credits):
For public health professionals to be effective, they must be able to ensure that policies and interventions are evidence-based. Epidemiologists design studies to determine which policies and interventions are most effective in promoting healthy individuals, families and societies. Biostatistics provides epidemiologists with the necessary tool kit to appropriately analyze public health data. The emphasis of this class is on acquiring a

set of foundational tools in regression models to apply to public health research questions and data. Topics include simple and multiple linear regression, logistic regression, ordinal and polytomous regression and model building techniques including assessing for multi-collinearity, effect measure modification, non-linearity and model fit statistics.

- *Required for the EPI 2014 cohort and following*
- *For EPI students, this course should be taken instead of PUBH 805*
- *Co or Prerequisite: Graduate-level introductory biostatics course*

PUBH 825 Applied Biostatistics II (3 credits):
This course is designed to expand on the biostatistical methods covered in Applied Biostatistics I to deepen the analytic repertoire of students with respect to regression modeling through the introduction of loglinear and generalized linear models including Poisson and Negative Binomial regressions as well as introduce techniques for analysis of longitudinal data including random and mixed effect models, and survival analysis.

- *Required for the EPI 2014 cohort and following*
- *Prerequisite: PUBH 824*

Environmental and Occupational Health (EOH)

The EOH track trains doctoral-level researchers and teachers about Environmental and Occupational Health problems affecting populations. Students have backgrounds in environmental science, occupational health, industrial hygiene, environmental policy, environmental epidemiology, and other related fields. The program includes a focus on Environmental and Occupational Health regulation, as well as planning and its impact on human health. The curriculum combines an understanding of how elements of the urban infrastructure – e.g., the built environment, commerce and productive activities, energy and communication systems, water, waste management and transport systems – interact with macrosocial trends (e.g., demographic, economic, and political processes) to affect environmental conditions (e.g., air, water, land and workplace) and human health. Coursework and research is aimed at furthering scientific understanding of the ways in which urbanization compromises the physical environment and human health as well as the ways in which it promotes health. topics such as environmental sustainability, environmental justice, economic viability, and political participation are examined.

The EOH track will produce graduates who can:

- Advance the scientific understanding of the impact of environmental and occupational conditions on health and disease.
- Plan, lead and manage studies to monitor and evaluate the heath effects of potential hazards in the workplace and broader environment.
- Plan, direct, manage and evaluate environmental and occupational health programs.
- Teach students and professionals about the impact of environmental and occupational hazards on the health of populations and about strategies for controlling such exposures.

Curriculum:
The core curriculum in EOH includes courses on the health impacts of the physical environment and research methodology. Electives are chosen in consultation with the faculty advisor.

Requirements for all EOH students:	
PUBH 830	Emerging Issues in Environmental and Occupational Health
PUBH 831	Environmental and Occupational Health Risk Assessment, Management and Communication in Urban Settings
One urban environment course (required for the 2014 cohorts and following)	
Plus, cohorts preceding 2012:	
Five electives: two in research methods in environmental or occupational health, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement), one leadership elective, one course in statistics or instrumentation; one course in geographic information systems.	
Plus, 2012 cohort and following	
Four advanced research methods or track-specific practice courses, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement) and one must be a course focusing on the urban environment.	

PUBH 830 Emerging Issues in Environmental and Occupational Health (3 credits): This course examines the impact of macro-level trends – such as corporate globalization, immigration patterns, and technological development – on the urban physical environment. It focuses on the relationship between the urban infrastructure (e.g., housing, transportation, sewage and waste disposal) and environmental media (e.g., air quality, water quality and land use). This course also examines the impact of macro-level trends on occupational health and safety conditions, focusing on such issues as outsourcing of manufacturing jobs to developing nations, the rise in the service and informal economies, immigrant labor, de-unionization, the new working class and the loss of the safety net. It examines the effectiveness of current policies in addressing these problems. Through focused readings and in-depth examination of case studies, students develop the tools for analyzing how macro-social trends affect the urban physical environment, workplaces and health. Teams of students then analyze an environmental and occupational issue, illustrate how it affects urban communities, and develop solutions to reduce environmental and occupational health burdens.

- *Required for all EOH students*

PUBH 831 Environmental and Occupational Health Risk Assessment, Management and Communication in Urban Settings (3 credits): This course examines the development and use of Environmental and Occupational Health risk assessment and its policy implications as applied to urban settings. Approaches to assessing, communicating about and managing urban Environmental and Occupational Health risks are critically analyzed within their political, economic, social and cultural contexts. Risk assessment and risk management procedures are evaluated in light of several themes including public participation, sustainable development, environmental justice, and natural and technological hazards. Students conduct risk assessments on real world environmental and occupational health problems, develop effective written and verbal approaches to communicating the results of risk assessments, and critically review case studies in which Environmental and Occupational Health risk assessments have been used in setting public policy.

- *Required for all EOH students*

Health Policy and Management (HPM)

The HPM track prepares students for careers in research, teaching, policy analysis and organizational analysis in the broad fields of health services, health policy, and health management. Students will select a concentration in either Health Policy or Health Management. Students who choose Health Policy as a concentration will develop a nuanced understanding of how a range of mechanisms are systematically associated with policy and influence population health. Students who choose Health Management as a concentration will incorporate organizational theory and analysis in understanding how organizational structures, networks, and behavior influence the health of populations.

The HPM track will prepare graduates who can:

- Contribute to new knowledge about the mechanisms that influence the delivery of health services and public health programs and the development of health policy.
- Develop and manage initiatives to strengthen the functioning of health systems, health care organizations and public health agencies and programs.
- Develop, advocate for and implement health care and public health policies.
- Analyze the impact of health and non-health policies on population health.
- Teach students and professionals about the social determinants of health, health interventions, health policy, health management and health disparities.

Curriculum:
The core curriculum in HPM includes coursework in management and research methods. Electives are chosen in consultation with the faculty advisor.

Requirements for all HPM students:	
PUBH 840	Seminar in Health Policy and Management
PUBH 841	Quantitative Methods in Health Services Research
PUBH 842 (required for the 2014 cohorts and following)	Public Health Economics
PUBH 843 (required for the 2014 cohorts and following)	Health Policy Analysis Methods
Plus, cohorts preceding 2012	
Five electives: one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement), one leadership elective, one course in policy or management (economics, sociology, and political science); two research methods courses (one in economics or finance; one in research design, data analysis, econometric analysis, quantitative decision analysis, policy analysis, management, or practice).	
Plus, 2012 cohort and following	
Four advanced research methods or track-specific practice courses, one of which must be from a Graduate Center program outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement) and one must be a Health Economics course.	
Plus, 2014 cohort and following	
Three advanced research methods or track-specific practice courses, of which one must be from a Graduate Center department outside of Public Health (DPH courses that are cross-listed with another program can count toward this requirement).	

PUBH 840 Seminar in Health Policy and Management (3 credits): The objective of the course is to understand patterns in the organization, financing, and delivery of health care, and their relationship to population-based health outcomes, through an integrated exploration of research from the various disciplines informing the health policy and management fields. With an emphasis on the development of critical thinking skills, students are introduced to multidisciplinary models from the social sciences as conceptual sources for health policy and management research. The course adapts a transdisciplinary approach to the examination of important topics in urban public health management and policy, such as the relationship between health systems and the urban-based health economy, and the interface between managerial functions and health policy analysis in addressing health status and outcomes disparities.

- *Required for all HPM students*

PUBH 841 Quantitative Methods in Health Services Research (3 credits): This course focuses on quantitative reasoning skills in health services research within the context of the principles of the scientific method and the logic of the research process. The logic and methodologies of problem formulation, development of hypotheses and objectives, multidisciplinary research design, sampling, operationalization and measurement are reviewed in connection with selected analytic strategies, such as cross-section/time-series design, multilevel analysis, cost effectiveness analysis, and health impact assessment. Methodological connections between practice-based performance assessment for management and population-based health outcomes assessment for policy are addressed.

- *Required for all HPM students*
- *Prerequisite: PUBH 840*

PUBH 842 Public Health Economics (3 credits): The broad literature on health economics helps improve the understanding of issues related to public health and its influence in the decision-making process of cost-effective interventions for the overall population health. The emphasis of this class is on acquiring a set of devices from the economic theory and a framework within which to organize empirical analysis to inform health and public health policy. Topics will include the analysis of the overall health market, and in particular the analysis of the demand for health, health care and insurance, the supply of health care and insurance, the

market structure of the health care sector, and, finally, the positive and normative aspects of performance of the health care sector.

- *Required for the 2014 cohort and following*

PUBH 843 Health Policy Analysis Methods (3 credits): This course is designed to expand and deepen the analytic repertoire of students with respect to (1) the analysis of problems or issues that face health policy-makers; (2) the analysis of alternative solutions so those problems and (3) the evaluation of selected solutions (including doing nothing). The course uses research and analytic methods drawn from epidemiology, decision sciences, political science, sociology, social psychology and economics. It emphases how methods developed within these disciplines can be applied to policy analysis in public health and health care.

- *Required for the 2014 cohort and following*
- *Pre or Co-requisites PUBH 840 and PUBH 841*

Course Sequencing

* Required for the first exam § Has prerequisites † Has Pre or Co-requisites	Part time: 4 courses an academic year Full time: 7 courses an academic year

Requirements for all Tracks - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time**	**Part Time**	**Semester Typically Offered**
PUBH 800	Cities, Society and Health*	1st year	1st year	Fall
PUBH 801	Interdisciplinary Approaches to Urban Health Research*§	1st year	1st year	Spring
PUBH 805	Quantitative Research Methods with Applications to Urban Health*† (CSH, HPM, EOH)	1st year	2nd year	Fall
PUBH 806	Qualitative Research Methods with Application to Urban Health*	1st year	1st year	Spring
PUBH 820	Epidemiologic Methods I*	1st year	1st or 2nd year	Fall/Spring
The First Exam	Requirements to apply for the First Exam are marked with an*	1st year	2nd year	2 weeks before Fall Semester
PUBH 890	Advanced Research Seminar I§	2nd year	3rd year	Fall
PUBH 893	Public Health Leadership Development Seminar§	2nd year	3rd year	Fall
PUBH 807	Practicum Project§	2nd or 3rd year	3rd or 4th year	Fall/Spring
The Second Exam	Eligible after all coursework completed except PUBH 891, PUBH 898, and PUBH 900.	3rd or 4th year	4th or 5th year	Student's own schedule (~4-9 months)
PUBH 891	Advanced Research Seminar II§	3rd or 4th year	4th or 5th year	Fall/Spring
PUBH 898	Dissertation Seminar§	4th and 5th years	5th and 6th years	Fall/Spring
PUBH 900	Dissertation Supervision§	4th and 5th years	5th and 6th years	Fall/Spring

Requirements for CSH - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time:** 1st year - Two courses from this section for the first exam*	**Part Time:** 1st year - One course from this section for the first exam; 2nd year - A second course from this section for the first exam*	**Semester Typically Offered**
PUBH 810	Community Health Interventions†	1st or 2nd year	1st, 2nd, or 3rd year	Spring
PUBH 811	Social & Behavioral Dimensions of Health	1st year	1st year	Fall
PUBH 816	Evaluation of Public Health Programs and Policies	1st or 2nd year	1st, 2nd, or 3rd year	Fall
Four advanced research methods or track-specific practice courses, one of which one must be from a Graduate Center department outside of Public Health.		1st or 2nd year	1st, 2nd, or 3rd year	Fall/Spring

Requirements for EPI - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time:** 1st year - Two courses (in addition to PUBH 824) from this section for the first exam*	**Part Time:** 1st year - One course (in addition to PUBH 824) from this section for the first exam; 2nd year - A third course from this section for the first exam*	**Semester Typically Offered**
PUBH 821	Epidemiologic Methods II§	1st or 2nd year	1st or 2nd year	Fall
PUBH 822	Epidemiologic Methods III§	1st or 2nd year	1st or 2nd year	Spring
PUBH 823	Epidemiologic Methods IV§	2nd or 3rd year	3rd or 4th year	Fall
PUBH 824	Biostatistics I*	1st year	1st year	Fall/Spring
PUBH 825	Biostatistics II§	1st or 2nd year	1st, 2nd, or 3rd year	Fall
Three advanced research methods or track-specific practice courses, one of which one must be from a Graduate Center department outside of Public Health.		1st or 2nd year	1st, 2nd, or 3rd year	Fall/Spring

Requirements for EOH - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time:** 1st year - Two courses from this section for the first exam*	**Part Time:** . 1st year - One course from this section for the first exam; 2nd year - A second course from this section for the first exam*	**Semester Typically Offered**
PUBH 830	Emerging Issues in EOH	1st or 2nd year	1st or 2nd year	Every other Fall or Spring
PUBH 831	Environmental & Occupational Health Risk Assessment	1st or 2nd year	1st or 2nd year	Every other Fall or Spring
One Urban Environment course (3 credits)		1st or 2nd year	1st, 2nd, or 3rd year	Fall/Spring
Four advanced research methods or track-specific practice courses, one of which one must be from a Graduate Center department outside of Public Health.		1st or 2nd year	1st, 2nd, or 3rd year	Fall/Spring

Requirements for HPM - 2014 Cohort and Following				
Course Number	**Course Title**	**Full Time:** 1st year - Two courses from this section for the first exam*	**Part Time:** . 1st year - One course from this section for the first exam; 2nd year - A second course from this section for the first exam*	**Semester Typically Offered**
PUBH 840	Seminar in Health Policy and Management	1st or 2nd year	1st or 2nd year	Fall
PUBH 841	Quantitative Methods in Health Services Research§	1st or 2nd year	1st or 2nd year	Spring
PUBH 842	Public Health Economics	1st or 2nd year	1st or 2nd year	Spring
PUBH 843	Health Policy Analysis Methods†	1st or 2nd year	1st or 2nd year	Fall
Three advanced research methods or track-specific practice courses, one of which one must be from a Graduate Center department outside of Public Health.		1st, 2nd, or 3rd year	1st, 2nd, or 3rd year	Fall/Spring

Concentration in Nutrition

The Nutrition Concentration is open to students in any specialization track who have prior training in nutrition, food sciences or food policy. Students can learn more about the requirements and expectations of the concentration by consulting Professor Arlene Spark, Coordinator of the concentration, or their Track Coordinator. Students in the concentration are expected to complete four courses (12 credits) that meet both track and concentration requirements, i.e., no extra credits are required. PUBH 814 Food Politics and Policies or its equivalent; SOC 828 Food, Culture and Society or its equivalent; an advanced three credit epidemiology course relevant to nutrition (e.g., Nutritional Epidemiology; Chronic Disease Epidemiology, Life Course Epidemiology) and one three credit elective in research methods relevant to public health nutrition.

PUBH 814 Food Politics and Policies (3 credits): This is a policy course that examines the effects of the food industry and government on diet-related disease, and on health promotion and disease prevention. Most readings have a strong political content. Central themes include: government action versus individual liberty, the contradictions of government support and opposition to certain policies, the role of litigation, and the importance of institutions (e.g., bureaucracy, Congress, the media).

SOC 828 Food, Culture and Society (3 credits): This course explores major issues in foodways, focusing on preparation and consumption, through readings and discussions as well as through the development of a culturally-informed public health nutrition initiative and fieldwork exploring a specific cultural food tradition. Theoretical frameworks include the food voice, cultural studies, political economy, and symbolic interactionism. Materials are drawn from across the social sciences and applied to public health.

Concentration in Maternal, Child, Reproductive and Sexual Health

MCRSH is a key to the long-term health of individuals, families, communities and societies. Reproductive and sexual health problems -- such as unintended pregnancies, maternal death, sexually transmitted diseases (STDs), gender-related violence and others -- are still the leading cause of illness and death for women of childbearing age worldwide. Although infant and childhood mortality is declining overall, some regions of the developing world still face significant burdens. The MCRSH concentration is designed to provide students with a theoretical understanding of the social and historical context that shapes maternal, child, reproductive and sexual behaviors and health outcomes across the life-span; and with practical experience in research, programs and/or policies to reduce disparities and promote health. Students in the MCRSH concentration will take three MCRSH specific courses: two required courses (PUBH 870 and PUBH 871) and one MCRSH-related elective (9 credits total). The MCRSH specific courses will replace the elective requirements of the Community, Society and Health track; students in the Epidemiology, Environmental and Occupational Health, and Health Policy and Management tracks may seek a concentration in MCRSH if they take these three required courses in addition to their track specific elective requirements. Students completing the MCRSH concentration are further required to have an MCRSH focus to their (1) PUBH 807 Practicum Project (3 credits) (2) PUBH 890 Advanced Research Seminar I (3 credits), (3) PUBH 891 Advanced Research Seminar II (3 credits), and (4) their second exam and (5) their dissertation (PUBH 898 Dissertation Seminar (0 credits) & PUBH 900 Dissertation Supervision (0 credits)). Thus the MCRSH concentration within the DPH will require that 18 of the 48 (or 57 for non CHS students) credits plus the second exam and the dissertation be focused on MCRSH, providing a solid foundation in this area.

PUBH 870 Maternal, Child, Reproductive and Sexual Health in Context (3 credits): A critical overview of public health issues, approaches and concerns in the area of Maternal, Child, Reproductive and Sexual Health. Topics will include the medicalization of maternity care and infancy/childhood; the consequences of 'risk' as a dominant ideology for Maternal, Child, Reproductive and Sexual Health care; issues in reproductive justice, with particular attention to race and class, and the historic and contemporary influence of eugenics in public health; the history of midwifery and global trends in midwifery care; and the role of public health interventions in infant care; sexual health and gender identity.

PUBH 871 Maternal, Child, Reproductive and Sexual Health: A Life Course Perspective (3 credits): Provides a theoretical framework as to how life course exposures affect vulnerability to disease, with an emphasis on the roles of maternal, child, reproductive and sexual health. This course also considers how intra- and inter-generational influences may be relevant to disparities in health. Readings will address empirical patterns, prevailing theories and controversies regarding life course influences, as well as addressing interventions or policies that may be applied to improve population health.

- *Prerequisite: PUBH 820*

First Examination Guidelines

Content
The First Exam is intended to assess students' mastery of the core courses and their preparedness to advance in the program. The exam assesses the capacity to synthesize material and apply knowledge from these required courses to analyze current public health issues and come to well-reasoned conclusions.

Requirements to Apply
Successful completion of courses listed below or their equivalent, or registered in the course at the time of application:
PUBH 800 Cities, Society, and Health
PUBH 801 Interdisciplinary Approaches to Urban Health Research
PUBH 805 Quantitative Research Methods with Applications to Urban Health (PUBH 824 for EPI students)
PUBH 806 Qualitative Research Methods with Application to Urban Health
PUBH 820 Epidemiologic Methods I

Examination Frequency and Timing
The First Exam is offered once per year two weeks before the start of the Fall semester.

Examination Format
The First Exam follows a take-home format, and includes questions based on peer-reviewed articles that are provided to the student at the start of the exam. The exam focuses on the application of key DPH competencies and critical analysis of public health issues in three public health domains: (1) Theoretical Frameworks; (2) Methodological Frameworks; and (3) Research Methods. Students write three essays in response to three questions (one from each of the above three domains). Responses are expected to demonstrate critical analysis skills, in depth understanding of public health theory, research methods, clear writing skills, and, at times, knowledge of specific content areas. Students are expected to draw on content from core courses, as summarized in a First Exam reading list provided. The student's understanding should be expressed in depth in a well written and organized answer in which selected relevant information is thoughtfully presented with appropriate citations from the literature. All assertions of fact are to be documented with references to published, peer-reviewed literature.

Process and Procedures
Students are responsible for ensuring that the Application for Eligibility for First Exam for the Doctor of Public Health Program is reviewed, approved and signed by their Advisor and Track Coordinator. The application due date will be announced the semester prior to when the exam is to take place. The application for the First Exam is on Blackboard.

While students may prepare for the exam with other students, they are required to work completely independently without any collaboration after the exam is distributed. Students may refer to relevant class notes and reference materials when writing the answers to the examination questions. Reading lists for the first exam are updated annually.

Students have two weeks to complete and submit the exam. The instructions for the exam will include due date and time and required formatting. Students must submit an electronic version by the due date and time and a hard copy signed statement of academic integrity should be mailed or hand delivered to the DPH Office and arrive within a week of the electronic due date. Once the exam is made available, all students approved to take the exam must submit a completed exam by the due date and time. Failure to submit the exam by the due date and time will result in a failing grade for the entire exam. Students must keep a record of their sent e-mail in the event that there are any questions regarding the timing of submission.

The DPH Curriculum and Examinations committee appoints a DPH First Exam Committee, which oversees and coordinates all aspects of the First Exam administration, from selecting readings to developing answer keys to grading. Members of this Committee will include representation from each DPH Track. All questions regarding a specific First Exam should be directed to the First Exam Committee Chair.

Assessment & Grading

Exams will be coded with a unique identifier for anonymous grading. A first reader (inside the student's track) and second reader (outside of the student's track) will be designated for each exam. The APO is the only person who knows the pairings of student exams to exam readers. Readers will independently read and grade the exam. Ratings will be based on how well the student demonstrates a capacity to apply knowledge and skills gained in the required coursework and synthesize information. Each question will be rated using the following scale

> Satisfactory – adequate understanding of and written communication about the subject matter.
>
> Unsatisfactory – fundamental misunderstanding or inadequate mastery of or poor written communication about key concepts or principles; inadequate responses to the questions being asked on the exam; additional work needed to meet program expectations.

Satisfactory Responses

Responses to a given question on the First Exam that meet the above criteria will be judged "Satisfactory." Please be aware that for each answer that meets this standard, detailed feedback will not be given to the student.

Unsatisfactory Responses

<u>"Unsatisfactory" response to only one question on the First Exam:</u>

Students with answers that receive an "Unsatisfactory" rating from both readers for one answer will be given the opportunity to rewrite it within a 2-week period. For answers to a given question that receive an "Unsatisfactory" rating from only one of the two readers on one answer, a third reader will be asked to rate that answer. If the third reader also judges the response to be unsatisfactory, the student will be given broad feedback on the problems with their responses, and the opportunity to rewrite that answer within a 2-week period. Students will be allowed only one chance to rewrite an answer to a question that received an "Unsatisfactory" rating. Failure to rewrite the answer within the given timeline or the receipt of an unsatisfactory grade on the rewrite will result in a failure of the exam. Students who fall into this category must work with their Track Coordinator or a designee to develop a plan for preparing for a one-time retake the entire First Exam the next time it is offered, which must be approved by Track Coordinator and Executive Officer within one month of the notice of the unsuccessful completion of the First Exam. Students must pass all questions in the re-take exam; students will not be allowed to re-write any question from a retake examination. Students are allowed to retake the exam only once and students who fail even one question on the retake or do not retake the exam at the next offering of the first exam will be asked to withdraw from the program.

<u>"Unsatisfactory" responses to more than one question on the First Exam :</u>

Students who are given an "Unsatisfactory" rating on two or three responses by both readers (or by the third reader in the event that the first two readers give discrepant grades) will be allowed one opportunity to retake the First Exam at the time of the next scheduled administration of the exam. Students who fall into this category must meet with their Track Coordinator or a designee to receive broad feedback regarding the problems with their responses. They must then work with their Track Coordinator or a designee to develop a plan for preparing to retake the First Exam, which must be approved by the Track Coordinator and Executive Officer within one month of the notice of the unsuccessful completion of the First Exam. Students must pass all questions in a re-take exam; students will not be allowed to re-write any question during a retake examination. Students are allowed to retake the exam only once and students who fail even one question on the retake or do not retake the exam at the next offering of the first exam will be asked to withdraw from the program.

Second Examination Guidelines

The Second Examination Guidelines section consists of:

- Second Exam Overview
- The Second Exam in Relation to Coursework, Registration, Timeframe
- The Second Exam Committee – Roles and Responsibilities
- Assessment of the Second Exam Applying for the Second Exam – Checkpoints
- Developing the Reading List and Writing the Second Exam – Checkpoints
- The Second Exam Defense– Checkpoints

Second Exam Overview

The Second Exam assesses the student's preparation and readiness to engage in dissertation research. It also further lays the groundwork for the student's dissertation research. The Second Exam has both a written and an oral component. It examines mastery of theory, evaluation of empirical evidence, and advanced methods relevant to the student's track and future dissertation research.

The Second Exam in Relation to Coursework, Registration, Timeframe

Students work on the Second Exam only after successfully completing the First Exam and all required and elective courses, with the exception of PUBH 891 Advanced Research Seminar II, PUBH 898 Dissertation Seminar, and PUBH 900 Dissertation Supervision. In order to take PUBH 891 Research Seminar II, students need to have defended the Second Exam or, by permission of the instructor, have the defense scheduled to occur within the first two weeks of the semester. Students must then successfully defend the Second Exam within the first two weeks of the semester in order to continue the course.

In order to stay active in the program while working on the Second Exam, students should register for Weighted Instructional Units (WIUs). See page 8 for details.

There are no established times for Second Exam approval or defense. The timing depends on the approval process, as well as the readiness of the student and the availability of committee members. It may be challenging to secure availability of committee members during the winter or summer breaks, and students should inquire about availability during those times, as well as upcoming sabbaticals, in advance and plan accordingly.

The Second Exam Committee – Roles and Responsibilities

The Second Exam committee consists of 3 members: Sponsor, Reader and Chair. Committee members must be approved by the Track Coordinator and the Executive Officer via the Second Exam application (found on Blackboard). All Second Exam Committee members must be members of the DPH Faculty. However, with adequate justification, requests for an exception may be made in writing to the Track Coordinator and Executive Officer.

Sponsor

The Sponsor (who may or may not be the student's Academic Advisor) is a DPH faculty member who works most closely with the student in preparing the Second Exam application and reading list and in developing a mature draft of the exam. The student and Sponsor discuss possible committee members, and these members are approached and invited to the committee by the Sponsor (not the student). The Sponsor works with the student to develop a working target date for the final submission of the written component of the exam. The Sponsor must approve the final readings list, and work closely with the student as s/he develops the written exam, approving the mature draft of the Second Exam before it is shared with t the Reader and Chair. Students should expect to work through a number of drafts before the written second exam is deemed ready for the oral defense. The Sponsor should be from the same Track as the student (unless otherwise requested by the student to the TC and approved by the EO) and serves as the primary liaison with the other committee members. If the Sponsor is not from the same Track as the Student, then the Reader must be, with no exceptions.

Reader

The preliminary reading list, developed by the Sponsor and Student, is submitted to the Reader who is a DPH faculty member and will provide feedback and approve the final reading list. The Reader and Chair are responsible for providing written feedback to the student on a mature draft (read and approved by the Sponsor) of the Second Exam. The Student works with the Sponsor to incorporate revisions accordingly, and the Sponsor approves a near final draft with revisions to be shared with the Reader and Chair. The Reader and Chair review the revised draft, provide feedback to the student as needed until they, together with the Sponsor, approve the revised Second Exam as 'defense-ready'. Once the Committee has approved the revised Second Exam as "defense ready", it is disseminated to the committee in its final format and a defense date scheduled. The timeline for the defense will allow 4 weeks for the committee to read the final version of the Second Exam prior to the defense. The Reader must be from the same Track as the student (unless otherwise requested by the TC and approved by the EO). If the Reader is not in the same track as the student, the Sponsor must be, with no exceptions. In rare instances the Reader may be from outside the DPH Program or CUNY, but this must be justified by the Sponsor and approved in advance by the Track Coordinator and Executive Officer.

Chair

The Chair is a DPH faculty member who schedules and runs the defense meeting, is responsible for ensuring that all procedures are properly followed, presides over deliberations regarding the final outcome, and communicates the final outcome of the defense to the APO, Track Coordinator, and Executive Officer. The Chair must approve the final reading list, and, along with the Reader, is responsible for providing written feedback to the student on a mature draft (read and approved by the Sponsor) of the written component of the Second Exam before the defense, and for reading the final version of the Second Exam prior to the defense.

Assessment of the Second Exam

Each committee member will rate the written and oral components based on the following:

Excellent – Clearly written, demonstrates mastery of subject matter, critical thinking abilities, concise synthesis and analysis of the literature. Ready to proceed to independent dissertation research.

Satisfactory – Clearly written, adequate understanding of subject matter and critical analysis and synthesis of the literature, with expectation that student will hone specific areas in order to be better prepared to commence independent dissertation research.

Unsatisfactory – Does not demonstrate understanding of subject matter and critical thinking abilities. Does not appear ready to commence independent dissertation research.

Applying for the Second Exam – Checkpoints

Student:

- Identify a Second Exam Sponsor by consulting with their Academic Advisor, tracking research activities of faculty working in areas of interest of the student, and meeting with faculty to explore possibilities for dissertation research.
- Discuss in detail the possibilities and work with the Sponsor to develop a draft, one page description of the planned dissertation research and Second Exam topic areas (see next bullet).
- Apply for the Second Exam by submitting a completed Application for Eligibility for Second Exam (found on Blackboard). Along with the application, students must submit a one page description of the planned dissertation background, topics/research questions, and methods (recognizing that these may be evolving) as well as a one page description about how the two topic/content areas and two methodological topics will feed into and support the planned dissertation research, to their Second Exam Sponsor.

Sponsor:

- Accepts the request to act as the Sponsor, and works closely with the student, serving as the primary liaison with the other committee members for the student's Second Exam.
- Approaches the Reader and Chair to invite them to act in those roles for student's Second Exam.
- Critically reviews and approves the student's Second Exam application and one page description.

Reader:

- Accepts Sponsor's request to act as the Reader for the Student's Second Exam.
- Critically reviews and approves the student's Second Exam application and one page description.

Chair:

- Accepts Sponsor's request to act as the Chair for the Student's Second Exam.
- Critically reviews and approves the student's Second Exam application and one page description.

Other:

- Track Coordinator reviews and approves the student's Second Exam application and one page description.
- Executive Officer reviews and approves the student's Second Exam application and one page description.

Developing the Reading List and Writing the Second Exam – Checkpoints

Student:

- Once the Second Exam application has been approved, the student has the primary responsibility for developing a preliminary reading list that covers two public health-related content areas and two relevant methodological areas that will support the proposed dissertation research. From the date the student's reading list is approved, it is expected that the Second Exam will take from 4 to 9 months to complete. If 9 months pass and no substantive progress has been made in completing the written portion of the exam, the student must submit another Application for Eligibility for Second Exam.
- The written component of the Second Exam comprises of a critical literature review of two substantive public health-related topic areas and two methodological topic areas relevant to the student's planned dissertation research. The exam should include a summary and analysis of the peer-reviewed literature and current state of knowledge in the particular area, a discussion of gaps in knowledge, and important areas for future research. When possible, the four topic areas should be related to each other (i.e. the discussion of the literature highlights a common methodological approach, or a methodological weakness or gap, which is then discussed in more detail in the methodological area potion of the exam that covers what the method is, its strengths and weaknesses, and how this method has been or could be applied to the topic areas). The Second Exam is intended to serve as a foundation for the dissertation proposal, but is often broader in scope than a specific dissertation topic and includes discussion of related theories and empirical evidence that sets a general context for the dissertation research area.
- The student revises the written component of the second exam to incorporate feedback from the Sponsor, and later the other committee members. Students should expect to work through a number of drafts with the Sponsor before the written exam is deemed ready to disseminate to other committee members.
- The penultimate draft and final version of the written component of the exam must be no more than 20 double-spaced pages, excluding references, figures, and tables.
- The student submits the Second Exam Progress report to the Sponsor every two months during this process.
- The Student works with the Sponsor by sharing detailed responses to committee member comments, and incorporate revisions accordingly. The Sponsor must approve a near final draft with revisions to be shared with the Reader and Chair for their comments.
- The Reader and Chair review the Sponsor-approved revised draft, and provide feedback to the student as needed until they and the sponsor approve the revised Second Exam as 'defense-ready'. Once the Reader has approved the revised Second Exam, it is disseminated to the committee as a whole and a defense date scheduled at least 4 weeks later.
- During the entire process, the student prepares for the oral defense, which can include questions from the approved reading list and any other reading list provided by the student's Track Coordinator (e.g., general readings for the discipline) at the time of Second Exam approval.
- The student prepares a 10-15 minute presentation for the Second Exam defense, and practices the presentation, ideally in front of others in a position to provide feedback, to ensure a clear, comprehensive, and concise delivery.
- The student informs the DPH Program of any special audiovisual needs beyond PowerPoint projection at least one week in advance of the defense
- The student brings hard copies of the slides for committee members on the day of the defense.

Sponsor:

- Works with the student on setting a realistic timeframe for completion of the exam.
- Reviews and submits bi-monthly Second Exam Progress reports to the TC and EO.
- Reviews, provides input on, and approves the Reading List, working drafts, and mature drafts of the Second Exam before sharing with Reader and Chair.
- Works with student to address comments of Sponsor, Reader, and Chair.

- Works with student to prepare the Second Exam Defense presentation.
- Critically reviews the final written portion of the Second Exam in advance of the defense, and comes to the defense with an initial rating of the written component (Excellent, Satisfactory, Unsatisfactory) along with supporting information and questions.

Reader:

- Provides feedback on and approves final Reading List.
- Provides written feedback on mature, sponsor-approved draft.
- Works with student to ensure comments of Sponsor, Reader and Chair are adequately addressed, ultimately approving a final draft as 'defense ready.'
- Critically reviews the final written portion of the Second Exam in advance of the defense, and comes to the defense with an initial rating of the written component (Excellent, Satisfactory, Unsatisfactory) along with supporting information and questions.

Chair:

- Approves the final Reading list.
- Provides written feedback on a mature draft.
- Critically reviews the final written portion of the Second Exam in advance of the defense, and comes to the defense with an initial rating of the written component (Excellent, Satisfactory, Unsatisfactory) along with supporting information and questions.
- Communicates with the committee about when the exam is ready for defense, schedules the defense data for no less than 4 weeks following receipt of the final revised document and requests a room for the defense from the APO.

Other:

- At the time of the Second Exam application approval, the Track Coordinators may supplement the student's reading list with the intention to guide the student in theory and methods.
- The APO will schedule a room with standard A/V equipment.

The Second Exam Defense– Checkpoints

Student:
The student is responsible for both the written content of the Second Exam as well as any material included on general supplemental readings that may be provided by each Track.

Sponsor:

- The Sponsor has worked closely with the student on the entire Second Exam.
- Critically reviews the final proposal in advance of the defense, and comes to the defense prepared with comments and questions.

Reader:

- The Reader has given feedback on and approved the Reading List, provided feedback on mature drafts and ensured the final version is 'defense ready'.
- Critically reviews the final proposal in advance of the defense, and comes to the defense prepared with comments and questions.

Chair:

- The Chair has approved the Reading List, provided feedback on a mature draft and ensured the final version is 'defense ready'. The Chair communicates with the committee and when all agree that the written exam is defense ready, s/he schedules the defense date (at least 4 weeks after the student has submitted the final, committee approved draft) and requests a room from the APO.
- Critically reviews the final proposal in advance of the defense, and comes to the defense prepared with comments and questions.
- The Chair presides over the Second Exam Defense and reports the outcome to the student and the DPH Program (TC, EO and APO).

Second Exam Defense Process

1. The defense should last approximately 2 hours.

2. All committee members and the student are expected to arrive on time, turn off mobile devices, and remain in the room for the duration of the defense.

3. Immediately prior to the defense, the Committee will convene briefly and the Chair will check if there are any outstanding issues, describe the defense process and assign the order of the questioning. The Sponsor has the option of choosing to be the first or last questioner.

4. The student makes a brief summary presentation (s/he may present slides if helpful). Since all committee members will be intimately familiar with the content of exam by this point, this presentation should be 10-15 minutes in length, and in no cases should it be more than 20 minutes.

5. All committee members should be given the opportunity to pose questions to the student on the content of the written exam as well as general theory and methods questions related to the student's disciplinary Track.

6. The student responds to questions posed by the committee members.

7. Immediately following the presentation, questions and discussion, the Chair asks the student to step out of the room and the committee members come to a consensus on an overall grade of *excellent*, *satisfactory* or *unsatisfactory*, which is based on each faculty member's initial critical review of the written component and the student's oral defense. In the event that a student receives a grade of unsatisfactory on the exam, an ad hoc faculty committee will be formed by the EO to discuss the student's continuation in the program. This committee may decide to require that the student take additional coursework or complete other work before retaking the Second Exam, or the committee may request that the student withdraw from the Program. Students may be allowed to retake the Second Exam only once. If they do not pass the retake of the Second Exam, the student will be asked to withdraw from the Program.

8. The Chair reports to the outcome of the Second Exam defense to the student, the TC, the EO, and the APO.

Dissertation Guidelines

The Dissertation Guidelines section consists of:

- The Dissertation in Relation to Coursework, The Second Exam, Registration, Levels, and Records
- The Dissertation Committee – Roles and Responsibilities
- Preparation of the Dissertation Proposal - Checkpoints
- Dissertation Proposal Defense - Process
- Guidance on the Three Article Dissertation Model
- Guidance on the Traditional Dissertation Model
- Dissertation Review, Approval, and Preparation for the Defense - Checkpoints
- Dissertation Defense – Checkpoints
- Dissertation Defense - Process

After completing all coursework and exams, students complete an original dissertation research project.

The Dissertation in Relation to Coursework, The Second Exam, Registration, Levels, and Records
Within the first year of coursework, students should discuss possible dissertation topics and research questions with their advisor and other faculty members. By the end of the first year of coursework, students should have possible research topics and research questions identified. And by the end of PUBH 890 Advanced Research Seminar I, students should have made substantial progress toward identifying a topic, research questions, possible methods, and source of data for the dissertation (i.e. planned self-collection, a publicly available data source, or data from the research study already conducted by the student, a faculty member, student's workplace, or some other source). In identifying potential data for the dissertation, students might consider some of the publicly available data sources which are included on a list posted on BlackBoard.

Once an area and initial research questions are selected, students should determine if the appropriate data can be acquired and if s/he has the requisite research skills to analyze the data correctly or can gain the expertise to do so. As each student's dissertation is unique, it is not possible for the required Program coursework to cover every research method that might be used for a dissertation and students are expected to plan their elective courses, independent studies, and even include additional coursework or training aimed at preparing themselves for their independent dissertation research and associated analytic techniques they are planning to employ in order to successfully complete the dissertation.

In PUBH 891 Advanced Research Seminar II students will refine the dissertation proposal. Students are required to complete and submit the annual Dissertation Progress Report annually (with review and approval by the sponsor) by the second week of the spring semester of each year until the dissertation is successfully defended and deposited.

Students must complete all coursework, pass the First and Second Exams, identify a Dissertation Sponsor, and convene a dissertation committee approved by the Track Coordinator before registering for PUBH 900 Dissertation Supervision and PUBH 898 Dissertation Seminar. PUBH 900 Dissertation Supervision and PUBH 898 Dissertation Seminar are non-credit required course numbers that students must be registered for every semester they are working on the dissertation. The student must be registered for PUBH 900 and PUBH 898 in the same or preceding semester that the student deposits the dissertation.

Students can only be advanced to Level III after the completion of all coursework, passing the First and Second Exams, and defending their dissertation proposal. See page 7.

The name of the student as noted on the dissertation to be deposited must match that of the name in Banner. If a student wishes to change name of record with the GC, they should request a change of name form from the Registrar's Office and submit that along with supporting documentation well in advance of the defense and dissertation deposit dates.

Upon depositing the dissertation, the student must show evidence that their record has been cleared by the Bursar, the Registrar, the Office of Financial Aid, the Director of the Office of International Students (if applicable), and the Mina Rees Library at the Graduate Center.

The Dissertation Committee – Roles and Responsibilities

The Dissertation Committee consists of four to five people: Sponsor, First Reader, Chair, Outside Reader, and an optional Third Reader. The roles must each be held by a different person (one person cannot fill more than one role on the committee). In no circumstances shall both the Sponsor and the First Reader be from outside the student's Track. The Track Coordinator, in consultation with the Executive Officer, makes the final decision on all committee member appointments and changes.

The members of the dissertation committee usually serve from the proposal stage through the dissertation defense. In situations when changes need to occur, the Sponsor must request and the TC and EO must approve any replacement committee members.

Sponsor

The Sponsor is a DPH faculty member who has prior experience serving on dissertation committees, expertise in the student's interest area and must be from the same disciplinary Track as the student. The student must negotiate a dissertation research project that the Sponsor agrees to supervise. The Sponsor is the faculty member who works most closely with and mentors the student to guide research content, study design and conduct, data analysis, writing, interpretation of results, and help to foresee and solve problems. When a student registers for PUBH 900 Dissertation Supervision, they do so under their Sponsor's name. The Sponsor will identify and recruit other dissertation committee members, usually in consultation with the student. The Sponsor is responsible for providing feedback on early drafts of the proposal and dissertation, approving the draft that is provided to the First Reader. The Sponsor also works with the Student to manage any revisions to the dissertation proposal and the dissertation itself requested by other committee members. The Sponsor cannot be on sabbatical while sponsoring a student. In this instance, an appropriate 'back-up' Sponsor must be identified well in advance and submitted by the Sponsor for approval by the TC and EO. The sponsor may continue to advise the student in an unofficial capacity or officially by taking-on a different role in the committee (e.g. the sponsor and another committee member may switch roles during the sabbatical).

First Reader

The First Reader is a DPH faculty member who must be from the same disciplinary Track as the student. S/he often reads several mature drafts of the proposal and dissertation, providing comments on the aims, design, and analytic approaches, The First Reader must read and provide thorough feedback on the first full Sponsor-approved draft of the proposal and dissertation in addition to the final versions but may provide comments on drafts between these two versions as well if needed. The First Reader, in consultation with the Sponsor, must approve the dissertation proposal and dissertation as 'Defense Ready' prior to circulating it to other committee members.

Chair
The Chair is a senior member of the DPH faculty (professor or associate professor) with experience in dissertation committee membership and student sponsorship, and is from the same Track as the student. The Chair will read and give feedback on Sponsor and First Reader approved drafts of the dissertation proposal and the dissertation at least once prior to each defense. He or she also oversees the process, convenes meetings, including the defense itself, and works to resolve any differences that might arise in the committee. The Chair presides over the dissertation proposal defense and dissertation defense, and reports on the outcome of the defense to the APO, Track Coordinator, and Executive Officer.

Outside (Second) Reader
The Outside Reader cannot be a DPH program faculty member. The outside reader may be a faculty member appointed to any other CUNY program, University, or from a professional organization or agency. The Outside Reader will provide specific expertise and quality control and will review the Sponsor and First Reader approved drafts of the proposal and dissertation and provide at least one round of feedback before the defense is scheduled. All outside readers must have demonstrated training, experience, and capability of rigorously evaluating research in the student's discipline. A CV of the outside member must be reviewed by the Sponsor and approved by the Track Coordinator and EO prior to their committee appointment.

Optional (Third) Reader
The optional Fifth Member can be either a DPH faculty member or from outside the DPH program or CUNY. The optional Third Reader will provide specific expertise and quality control and will review the Sponsor and First Reader approved drafts of the proposal and dissertation and provide at least one round of feedback before the defense is scheduled. Prior to the committee appointment, rationale for the appointment of a Third Reader must be provided to the TC and EO, along with a recent CV.

Preparation of the Dissertation Proposal - Checkpoints

Overview:

1) The Student works closely with the Sponsor to develop a comprehensive and polished draft of the dissertation proposal.
2) With the Sponsor approval, this draft is then shared with the First Reader who provides feedback and works with the student in consultation with the Sponsor to ensure that any additional comments are addressed.
3) Then, with First Reader approval, the proposal is circulated to the entire committee by the student and the committee is given 4 weeks within which they must provide written feedback to the student.
4) The Chair contacts the committee members to see if there is agreement that the proposal is ready for defense, if not, the student addresses comments and circulates the next draft to the entire committee (until the committee agrees it is ready for defense). Once the committee agree the proposal is ready for defense,
5) the Chair schedules the defense.

There are no established times for the dissertation proposal defense. The timing depends on the readiness of the student and the availability of committee members. It may be challenging to secure availability of committee members during the winter or summer breaks, and students should inquire about availability during those times, as well as upcoming sabbaticals, in advance and plan accordingly.

Roles of the Student, Sponsor, and other Dissertation Committee members

Student:

- Prior to finalizing the proposal, the student must complete the online CUNY's Responsible Conduct of Research (RCR) training . This is not mandatory for soon to deposit/defend candidates, however newer cohorts should anticipate having to complete this training as part of PUBH 891 Advanced Research Methods II.
  http://www.cuny.edu/research/compliance/Responsible-Conduct-of-Research.html
- After the proposal defense, the student completes, signs and submits GC Human Participants Clearance Form, dissertation abstract, and IRB approval or exemption to Nichol Gallimore at ngallimore@gc.cuny.edu.
  All questions regarding the GC Human Participants Clearance Form should be directed to Nichol Gallimore.
  http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Research%20Funding/dissertation-form-letter_v2_1.pdf
  Please also review The CUNY Human Research Protection Program (HRPP) which comprises of 5 University Integrated Institutional Review Boards (IRBs) and 19 on-site HRPP offices.
  http://www.cuny.edu/research/compliance/human-subjects-research-1.html
- The student updates, submits and reviews the annual Dissertation Progress Report (found on Blackboard) with the Sponsor. The report must be approved by the Sponsor and submitted to the Track Coordinator by the second week of each spring semester until the dissertation is deposited.
- The Student prepares drafts of the dissertation proposal in the NIH format (see below) and shares with the Sponsor for review, input/feedback, and discussion.
- The Student may consult with other committee members regarding aspects of the proposal as it is under development.
- A mature, Sponsor-approved, full draft of the proposal is shared with the First Reader for review, input/feedback, and discussion. The student allows at least 4 weeks for review.

- The Student works with the Sponsor and First Reader to incorporate comments, suggestions, and feedback into a mature draft until it is approved by the First Reader, in consultation with the Sponsor.
- The First-Reader approved draft is then circulated to the entire committee for their review, input/feedback, and discussion. The student allows at least 4 weeks for review.
- All comments are shared with the Sponsor and First Reader for review and discussion. The student prepares responses to all major comments and reviews them with the Sponsor and First Reader.
- Additional revisions may be necessary, and the Sponsor and/or First Reader may recommend that the full committee review additional drafts. The Sponsor and First Reader work with the Student to revise the proposal accordingly.
- The Student must ensure that the proposal adheres to content and format guidelines below, including font size, line spacing, and page limits.
- Once the committee, approves the revised proposal (communicated to the Chair) as 'defense ready', the final proposal may be circulated to the full committee and a proposal defense date scheduled, allowing at least 4 weeks for review and identifying a day/time when all committee members can be present. The student prepares a 10-15 minute presentation for the Dissertation Proposal Defense, and practices the presentation, ideally in front of others in a position to provide feedback, to ensure a clear, comprehensive, and concise delivery.
- The student informs the DPH Program's APO of any special audiovisual needs beyond PowerPoint projection at least two weeks in advance of the defense.
- The student brings hard copies of the slides for committee members on the day of the defense.

Sponsor:

- Meet with the student regularly, review and provide input and guidance on all aspects of proposal development.
- Provide written feedback on all drafts of the proposal. Note that it is common for the proposal to go through multiple drafts before the Sponsor approves circulation of a full and mature draft to the First Reader.
- Review and ensure that the comments and revisions from all committee members are received and adequately considered and addressed as appropriate by the student.
- Approve mature draft of proposal for sharing with the First Reader.
- Consult with the First Reader on Student's proposal development progress and readiness to circulate to other committee members as needed.
- Critically review the final proposal in advance of the defense, and come to the defense prepared with comments and questions.

First Reader:

- Provide written feedback on full, mature, Sponsor-approved drafts of the proposal. Note that it is common for the proposal to go through multiple revisions before the First Reader approves circulation to the larger Dissertation Committee.
- Consult with the Sponsor on Student's proposal development progress and readiness to circulate to other committee members as needed.
- Critically review the final proposal in advance of the defense, and come to the defense prepared with comments and questions.

Chair:

- Provide written feedback on a mature, First-Reader approved draft.
- Communicates with committee members to determine when the proposal is ready for defense and a defense date can be scheduled.
- Schedules the defense, communicates with the APO to identify a room for the defense, and notifies the committee and student of the date and location for the defense.

- The Chair works with the Student and/or Committee Members as needed to resolve outstanding issues that cannot be resolved by the Student and the Sponsor or other committee members.
- Critically review the final proposal in advance of the defense, and come to the defense prepared with comments and questions.
- The Chair presides over the proposal defense and reports the outcome to the TC, EO and APO.

Outside (Second) Reader(s):

- The Outside Reader (and optional Third Reader) provide specific expertise and quality control.
- Provides written feedback on a mature, First-Reader approved draft. Critically review the final proposal in advance of the defense, and come to the defense prepared with comments and questions.

APO

- The APO will schedule a room with standard A/V equipment upon request from the Chair and student.

Dissertation Proposal Format

The dissertation proposal is a detailed plan that describes the content and methods of the planned dissertation. It is to be prepared in the NIH proposal format (below) and will include a statement of the problem, aims and research questions, a brief summary of relevant literature that explains the background and significance of the topic and describes the gaps that will be addressed by the dissertation, describes in some detail the study design, data sources, methods of data collection, and data analysis methods. Students are expected to describe and explain the theoretical framework for the study and include a power or sample size calculation for all quantitative analyses. The methods proposed should be both rigorous and feasible as it relates to achieving the aims and answering the proposed research questions as definitively as possible without major limitations that undermine or threaten the validity of the proposed research. The proposal should include a thorough description of the strengths and limitations of the proposed approach and a realistic timetable for completing the dissertation. It must also address human subjects issues related to your proposed research.

Elements of a Dissertation Proposal in the NIH format
Students should use the full 13 pages for their dissertation proposal, but no more than 13 pages.

1. Specific aims (1 page, single spaced)

2. Research Plan (12 pages, single spaced not including Human Subjects, citations and appendices)

    2.a. Background and significance, with 1 paragraph conclusion (no more than 2 pages)
    2.b. Innovation (about half a page)
    2.c. Approach (about 9.5 pages)

        2.c.1. Conceptual/Theoretical Framework w/ diagram (about 1 page)
        2.c.2. Preliminary data (if applicable, no more than half a page)
        2.c.3. Research design (6-7 pages, must address all proposal aims)
        2.c.3.1. Study design
        2.c.3.2. Study population and eligibility criteria (about 1-2 paragraphs)
        2.c.3.3. Data sources, collection, and management (about 1 page)
        2.c.3.4. Sampling/Recruitment procedures (if applicable)
        2.c.3.5. Primary and secondary outcome definitions
        2.c.3.6. Data analysis plan for each proposal Aim (i.e., statistical analysis/modeling or qualitative analysis)
        2.c.3.7. Statistical power and sample size for each Aim (if applicable, no more than half a page)

    2.d. Study timeline (1 paragraph or table)
    2.e. Generalizability (1 paragraph)
    2.f. Limitations and threats to the validity of the proposed research and how they will be managed (1 page)

3. Human Subjects (no page limit). For instructions, review Part II of NIH's Supplemental Instructions for Preparing the Protection of Human Subjects Section of the Research Plan.

4. Citations

5. Appendices (may include draft data collection instruments)

Dissertation Proposal Defense Process

1. The proposal defense should last approximately 2 hours.

2. All committee members and the student are expected to arrive on time, turn off mobile devices, and remain in the room for the duration of the defense.

3. Immediately prior to the defense, the Committee will convene briefly and the Chair will check if there are any outstanding issues, describe the defense process and assign the order of the questioning. The Sponsor has the option of choosing to be the first or last questioner.

4. Once the Committee and Student are assembled, the student gives a 10-15 minute formal presentation of the proposal (slides may be presented if desired). Since all committee members will be intimately familiar with the content of the proposal by this point, this presentation should be 10-15 minutes in length, and in no cases should it be more than 20 minutes.

5. Each committee member will ask questions and give feedback for approximately 15-20 minutes each.

6. The Chair will facilitate a discussion of the proposal.

7. Immediately following the presentation and discussion, the Chair asks the student to step out of the room and the committee members come to a consensus on the outcome of the proposal defense. The possible outcomes are: 1. Pass with no or minor revisions; 2. Pass with major revisions; 3. Failed. In the event of minor revisions, only the Sponsor must approve the revised dissertation proposal. In the event that major revisions are required, both the Sponsor and the First Reader must approve the revised dissertation proposal. In the event of a failed dissertation proposal defense, an ad hoc faculty committee will be formed by the TC and EO to develop a course of action.

8. The Chair will report the outcome of the proposal defense to the Track Coordinator, APO, and EO.

9. Final approved dissertation proposals must be submitted to the DPH Program office in PDF format by the Student for archival purposes.

Dissertation Preparation, Review, Approval, and the Dissertation Defense Process - Checkpoints

Overview:

1) The Student works closely with the Sponsor to develop comprehensive and polished drafts of individual dissertation chapters or manuscripts.
2) With the Sponsor's approval, draft chapters or manuscripts are then shared with the First Reader who provides feedback and works with the student in consultation with the Sponsor to ensure that any additional comments are addressed.
3) Then, with First Reader approval, individual dissertation chapters are circulated to the entire committee by the Student and the committee is given at least 3 weeks within which they must provide written feedback to the student on individual dissertation chapters.
4) The Student reviews comments with the Sponsor and incorporates revisions accordingly.
5) Revised, individual chapters are approved as 'Defense-ready' by the committee and communicated to the Chair (who notifies the Sponsor).
6) The Final Dissertation with all chapters is reviewed by the Sponsor and First Reader, and approved by both prior to circulation to the full committee, allowing 4 weeks for review and feedback.
7) Comments from the full committee are addressed, in consultation with the Sponsor and First Reader and upon approval by the Sponsor and First Reader, the Final Full Dissertation is disseminated to the full committee and a defense date is scheduled, allowing at least 4 weeks before the defense to allow time for all committee members to review the dissertation in its entirety.

There are no established times for the dissertation defense. The timing depends on the readiness of the student and the availability of committee members. It may be challenging to secure availability of committee members during the winter or summer breaks, and students should inquire about availability during those times, as well as upcoming sabbaticals, in advance and plan accordingly.

Student:

- The student updates, submits and reviews the annual Dissertation Progress Report (found on Blackboard) with the Sponsor. The report must be approved by the Sponsor and submitted to the Track Coordinator by the second week of each spring semester until the dissertation is deposited.
- The Student, in consultation with the Sponsor, chooses a dissertation format (3 paper model or traditional dissertation).
- The Student prepares drafts of individual dissertation chapters and shares with the sponsor for review, input/feedback, and discussion.
- The Student may consult with other committee members regarding aspects of the dissertation as it is under development.
- Mature, Sponsor-approved, full draft of individual chapters are shared with the First Reader for review, input/feedback, and discussion. The student allows at least 3 weeks for review of each chapter.
- The Student works with the Sponsor and First Reader to incorporate comments, suggestions, and feedback into a mature drafts of individual chapters that are approved by the First Reader, in consultation with the Sponsor.
- The First-Reader approved drafts of individual chapters are then circulated to the entire committee for their review, input/feedback, and discussion. The student allows at least 3 weeks for review.
- All comments are shared with the Sponsor and First Reader for review and discussion. The student prepares responses to all major comments and reviews them with the Sponsor and First Reader.
- The Student works with the Sponsor to address and incorporate all comments. A mature, Sponsor-Approved revised draft of each chapter is provided to the First Reader for their review, input/feedback,

discussion, and assessment of responsiveness to the committee's comment. The student allows at least 3 weeks for review.

- Additional revisions may be necessary, and the Sponsor and/or First Reader may recommend that the full committee review additional drafts of individual chapters. The Sponsor and First Reader work with the Student to revise the chapters accordingly.
- Once the committee has approved the individual chapters as defense ready (communicated to the Chair who informs the Sponsor), a full dissertation is developed with all chapters included for review by the Sponsor. This draft has incorporated and/or addressed all comments received by all committee members to date. The student incorporates final comments and edits from the Sponsor. A Sponsor-approved, full dissertation is then shared with the First Reader, allowing at least 4 weeks for review.
- Prior to circulating the full dissertation to the First Reader, the Student must ensure that the dissertation adheres to all content and format guidelines.
- Once the First Reader, in consultation with the Sponsor, approves the full dissertation as 'defense ready', the penultimate version of the full dissertation may be circulated to the full committee, allowing at least 4 weeks for review.
- Comments from the full committee are reviewed and incorporated by the student, in consultation with the Sponsor and First Reader. Once the Sponsor and First Reader determine that the feedback has been adequately addressed/incorporated by the student in a Final Full Dissertation, it may be circulated to the full committee, allowing at least four weeks for review prior to the scheduled defense date.
- The student prepares a 10-15 minute presentation for the Dissertation Defense, and practices the presentation, ideally in front of others in a position to provide feedback, to ensure a clear, comprehensive, and concise delivery.
- The student informs the DPH Program's APO of any special audiovisual needs beyond PowerPoint projection at least two weeks in advance of the defense.
- The student brings hard copies of the slides for committee members on the day of the defense.

Sponsor:

- Meet with the student regularly, review and provide input and guidance on all aspects of dissertation development.
- Provide written feedback on all drafts of dissertation chapters and the full dissertation. Note that it is common for dissertation chapters to go through multiple drafts before the sponsor approves circulation of a full and mature draft to the First Reader.
- Review and ensure that the comments and revisions to dissertation chapters from all committee members are received and adequately considered and addressed as appropriate by the student.
- Approve mature drafts before sharing with First Reader.
- Consult with the First Reader on Student's dissertation progress and readiness to circulate to other committee members as needed.
- Consult with the Chair on the readiness of the dissertation chapters for combining into the full dissertation.
- Work with the student to prepare the full dissertation, providing comments and feedback, and approve it for review by the First Reader.
- Work with the student to ensure committee comments on the full dissertation have been addressed.
- Critically review the final, full dissertation in advance of circulation for the defense, and come to the defense prepared with comments and questions.

First Reader:

- Provide written feedback on full, mature, Sponsor-approved drafts of individual dissertation chapters as well as the full dissertation. Note that it is common for dissertation chapters to go through multiple revisions before the First Reader approves circulation to the larger Dissertation Committee.
- Consult with the Sponsor on Student's dissertation progress and readiness to circulate chapters to other committee members as needed.
- The First Reader must approve the Final Full Dissertation as Defense-ready prior to scheduling the Dissertation Defense.
- Critically review the final dissertation in advance of the defense, and come to the defense prepared with comments and questions.

Chair:

- Provides written feedback on a mature First-Reader approved drafts of individual chapters as well as the full dissertation.
- The Chair works with the Student and/or Committee Members as needed to resolve outstanding issues that cannot be resolved by the Student and the Sponsor or other committee members.
- Communicate with committee members about their views on whether drafts of chapters and the first draft of the full dissertation will be ready for defense once comments have been addressed (or if the committee wants to see additional drafts).
- At least a month in advance of the defense , the Chair schedules the dissertation defense, requests a room for the defense from the APO, and communicates the date and location of the defense to the committee and student.
- At least a month in advance of the defense, the Chair provides the following to the APO with (1) Name of the student; (2) Title of dissertation; (3) Date, time, and place of the defense; and (4) Names of committee members, their affiliation, and email addresses to which invitations are to be sent.
- Critically review the final, full dissertation in advance of the defense, and come to the defense prepared with comments and questions.
- The Chair presides over the dissertation defense and reports the outcome to the TC, EO and APO.

Outside (Second) Reader(s):

- The Outside Reader (and optional Third Reader) provide specific expertise and quality control.
- The Outside Reader (and optional Third Reader) provide critical review and feedback on First Reader approved drafts of individual dissertation chapters as well as on the First Reader approved full dissertation draft.
- The Outside Reader (and optional Third Reader) will provide a critical review on the final, full dissertation, and come to the dissertation defense with prepared comments and questions.

Guidance on the Three Article Dissertation Model

Overview

This guidance is intended for students who choose to pursue a three article dissertation model. Students, sponsors, and other faculty serving on the dissertation committee should refer to this guidance in deciding whether the three article model would be appropriate for a given dissertation project, and subsequently when the dissertation is being written. This model is an option for DPH students and does not replace the current traditional dissertation model that has been used in the past and which remains as the alternate option. Some dissertation projects fit well under the three article model, and others are better written up in the traditional format. The choice of which model to work under for a given dissertation research project should be based on a discussion between the student and their sponsor, and the amount and complexity of the new research required for a dissertation would be similar no matter which format is chosen.

The DPH dissertation that conforms to the three article model comprises three separate papers (articles) of normal, discipline-specific, journal length that would be considered a 'publishable' research manuscript in a peer reviewed scientific or professional journal. The independence of the three papers reflects the fact that the articles may be read and understood without reference to one another; nevertheless, the papers must support an overarching research theme as outlined in the dissertation proposal. In addition, an overall introduction and conclusion to the dissertation in which the topics addressed in the three articles and, for the conclusion, their findings are synthesized together to provide an overall picture of the implications of the research to the field.

Format

The three papers are preceded in the dissertation document by an abstract and an introductory chapter, and are followed by a concluding chapter. Thus, the form of the 3-paper DPH Dissertation is as follows:

- Title page
- Abstract (for the overall dissertation)
- Table of contents
- List of Tables and Figures
- Acknowledgements and dedications
- Chapter 1: Introduction and background to the general topic area and gaps to be filled by the three articles.
    - Include the dissertation specific aims and hypotheses
- Chapter 2: First paper
- Chapter 3: Second paper
- Chapter 4: Third paper
- Chapter 5: Summary of results, conclusions and implications for policy and/or further research
    - Key Strengths and Limitations
    - Public Health Relevance
- Appendices

Specific Guidelines for the 3-paper DPH Dissertation

1. The introductory chapter provides an overview of the dissertation. It introduces the research theme and conceptual basis; establishes the public health importance of the problem under study; states the primary research questions and hypotheses; introduces methodological approaches; highlights and contextualizes salient literature; and briefly describes policy and programmatic implications. The specific aims and hypotheses of the dissertation must be included in this chapter.

2. The three papers must represent work that was initiated while the student was enrolled in the DPH program and approved by the student's entire dissertation committee at the dissertation proposal defense or officially in writing thereafter. The inclusion of research that was undertaken prior to defense of the dissertation proposal is permissible, however only with explicit committee approval prior to the dissertation proposal defense. As with the conventional dissertation model, all work must be independently conducted by the student.

3. The three papers must conform to the format of a typical scientific journal in the student's field of study, and be of normal length (3000-5000 words, depending on the target journal).For each of the three papers that are part of a student's dissertation, there will be a separate abstract. The three papers in the dissertation will likely include more in the way of methods and results than can fit into or is appropriate for a scientific journal article of normal length. Additional methodological detail, analyses or results synthesis conducted by the student or required by the committee (e.g., additional methodological detail, tables, figures, summaries, sub analyses, sensitivity analyses etc.) that is necessary for the dissertation, but not appropriate or too detailed for a journal article of normal length, should be included in the dissertation as appendices.

4. At least two of the three articles must be based on student analysis of data, either quantitative, qualitative, or mixed methods. A conceptual, theoretical, or methodological article is acceptable as a third paper, but must be closely aligned with the overall theme of the dissertation, and publishable, as judged by the dissertation committee. A literature review or synthesis is not acceptable for the third paper, as relevant literature should be critically appraised within the data analytic papers. However, systematic reviews and meta analyses are permissible.

5. "Publishability" of the articles is determined by the student's dissertation committee, which serves in the capacity of unofficial editorial board for the student. But in general, the committee should judge 'publishability' against the standard of leading peer reviewed scientific journals in the student's field of study.

6. Neither publication nor submission of the three articles is a requirement for completion of the DPH degree. Students may, however, submit committee-approved dissertation 'articles' to refereed scientific journals, even before the final dissertation defense, as external reviewer feedback will enhance quality and learning. In such cases, students should report feedback from peer reviewers to the sponsor and perhaps other committee members, and consult with them on incorporation of suggested modifications to the dissertation. A manuscript's acceptance for publication does not preclude committee members from requiring additional modifications to the manuscript for inclusion in the final dissertation.

7. The concluding chapter establishes the individual and collective contribution of the three articles to the student's area of inquiry. It discusses future research opportunities arising from the dissertation's development of the topic; It also details the public health relevance of findings (e.g., in terms of health policy, programs, practice or interventions). Finally, a critical discussion of key strengths and limitations of the research as it relates to the main findings across the three manuscripts must be included.

8. Authorship
    a. Independence: As with the conventional dissertation model, the DPH dissertation must be substantially the student's own work, and must be judged as such by the dissertation committee/examiners. However, once this has been established, in some cases it may be appropriate to include the dissertation sponsor and other dissertation committee members as co-authors on manuscripts being submitted to professional and scientific journals.
    b. The responsibilities of the first author: The student shall assume the role of first author on dissertation chapters submitted for publication. The responsibilities assumed of first author typically include: synthesis of the relevant literature, development of the major thesis, research question(s) and hypotheses; selection of an appropriate research design; development or adaptation of a conceptual model or framework; study design and data collection (where applicable); data management, analysis, and interpretation of results; preparation of major parts of manuscripts.
    c. Co-authorship: In no cases should authorship be expected or assumed by dissertation committee members. Students may invite dissertation committee members—or external mentors—to co-author a given paper from their dissertation, but the student must assume the role of "first author" on all articles. To be considered a co-author on a manuscript submitted for publication, faculty co-authors must contribute sufficiently to warrant co-authorship. Judgment of the potential contribution of co-authors can also be made by the student in consultation with the dissertation Sponsor, another committee member, or someone external to the dissertation committee. It is suggested that student use recommendations, such as those from the International Committee of Medical Journal Editors, as a guide to make determinations about authorship: (see http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html), which recommends that authorship be based on the following 4 criteria:
        - Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
        - Drafting the work or revising it critically for important intellectual content; AND
        - Final approval of the version to be published; AND
        - Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

      Dissertation committee members or external reviewers who may be appointed by the DPH Program at some time in the future to serve as 'examiners' for the purposes of quality control cannot serve as co-authors, but should be thought of more as 'peer reviewers'.

9. This guidance was first issued by the DPH Program in June 2014 and again revised for the 2015 Program Manual. It will be included in the student manual and updated annually and as the program accrues experience with the three article model. Students and committees are expected to adhere to the most recent guidance from the DPH Program, regardless of when the student's dissertation research began.

Guidance on the Traditional Dissertation Model

Overview

This guidance is intended for students who choose to pursue a traditional (book format) dissertation model. Students, sponsors, and other faculty serving on the dissertation committee should refer to this guidance in deciding whether the traditional dissertation model would be appropriate for a given dissertation project, and subsequently when the dissertation is being written. This model is the format that has been used in the past and remains as an alternate option for DPH students who do not choose the three article format. Some dissertation projects fit well under the traditional model and others may be better suited to the three article model. The choice of which model to work under for a given dissertation research project should be based on a discussion between the student and their sponsor, and the amount and complexity of the new research required for a dissertation would be similar no matter which format is chosen.

The DPH dissertation that conforms to the traditional model comprises multiple chapters together in a book format. Unlike the three separate article format, the literature review, methods and conclusions will be presented all together each in its own, single chapter (rather than repeated at the beginning of each of the three articles). The results will also be presented together in one, or if more appropriate, a few chapters. In addition, an overall introduction and conclusion to the dissertation will be included in which the topics addressed in chapters are synthesized together to provide an overall picture of the implications of the research to the field.

Format

The traditional dissertation is organized into sections. Each section may be a single chapter or may include a few chapters, depending on the amount of information being presented and the optimal organization of that information. It is likely that the results section will include more than one chapter as the quantity of analysis required for this dissertation format is similar to that of the three article format. Thus, the form of the Traditional DPH Dissertation is as follows:

- Title page
- Abstract for the overall dissertation
- Table of contents
- List of Tables and Figures
- Acknowledgements and dedications
- Section 1: Introduction and background to the general topic area and gaps to be filled
    - Include the dissertation aims and hypotheses
- Section 2: Literature Review
- Section3: Methodology
- Section 4: Results & Interpretation
- Section 5: Conclusions, Discussion and Evaluation
- Appendices

Specific Guidelines for the DPH Traditional Dissertation

The dissertation must be based on student analysis of data, either quantitative, qualitative, or mixed methods. It may include a conceptual, theoretical, or methodological section as well. A systematic review or meta analyses may be included as part of the dissertation, but is not, in itself, sufficient and additional data analysis is required. Below is a brief description of what to include within each section of a dissertation written in the traditional format.

Section 1. Introduction

This section should introduce the aims of the study, including its justification within the field and its significance, both to the track and to public health overall. As well, this section should present the dissertation aims, guiding research question(s) and hypotheses to be tested. This section might also be used to specify the bounds of this study and its relationship to other ongoing research (if it is an analysis of a large data set that is at the center of multiple studies, for example).

Section 2. Literature Review

This section provides a thorough, critical, and analytical overview of existing literature and scholarship relevant to the aim(s) and research question(s) guiding this study. Ideally, a literature review should be comprehensive, balanced, up-to-date, and organized so as to flow logically.

Section 3. Methodology

The methodology section should clearly and minutely detail the methods of sampling, data collection, and data analysis used. Population and instrumentation should be explained. Where standard instruments are used, they should be appropriately referenced and a discussion of their evaluation in terms of reliability and validity included. This section should also discuss any and all ethical considerations, procedures, and approvals or limitations as well as how reliability and validity are assured for this study in specific. It is imperative that this section be thorough, detailed, and logically organized and clearly presented.

Section 4. Results & Interpretation

Ideally, findings should be presented in subsections. Tables and figures should be included when appropriate for clarity. All interpretation of the results may either be saved for a separate chapter of the dissertation (within this section), or the interpretation may be included the same chapter as the results in a subsection following the presentation of the results. The results might all be presented within a single chapter or, if they are extensive, the results might be organized into a series of shorter chapters by topic.

Results should be summed up in the simplest form first before presenting analysis, in tables if possible, and then interpretation as to significance and conclusions.

Section 5: Conclusions, Discussion, and Evaluation

The fifth and final section should begin by summarizing the study, its aims, any hypothesis, and methods. Then, in referring back to the results presented in section 4, this section should summarize the analytic findings and interpretations, concluding with a discussion of the signification of the findings, whether any hypothesis was proven, partially proven, or disproven. As well, this chapter should look back on the overall study critically, both making the case for its strengths and importance and also discussing any weaknesses or limitations. Finally, the public health relevance should be discussed, including any policy recommendations or practical intervention suggestions. This is a particularly important chapter, as it is the best opportunity to offer a comprehensive view of the study and its lasting significance and to leave the reader with any parting thoughts.

Authorship

a. Independence: As with the three article model, the DPH dissertation must be substantially the student's own work, and must be judged as such by the dissertation committee/examiners. However, once this has been established, in some cases it may be appropriate to include the dissertation sponsor and other dissertation committee members as co-authors on the book generated from the dissertation, individual chapters in the book, or manuscripts developed from the dissertation for submission to professional and scientific journals.
b. The responsibilities of the first author: The student shall assume the role of first author on any book published based on the dissertation as well as on any manuscripts developed from the dissertation and submitted for publication. The responsibilities assumed of first author typically include: synthesis of the relevant literature, development of the major thesis, research question(s) and hypotheses; selection of an appropriate research design; development or adaptation of a conceptual model or framework; study design and data collection (where applicable); data management, analysis, and interpretation of results; preparation of major parts of manuscripts.
c. Co-authorship: In no cases should authorship be expected or assumed by dissertation committee members. Students may invite dissertation committee members—or external mentors—to co-author the book, chapters within the book, or a given manuscript developed from their dissertation, but the student must assume the role of "first author" on all publications (book or manuscript). To be considered a co-author on a book, book chapter or manuscript submitted for publication, faculty co-authors must contribute sufficiently to warrant co-authorship. Judgment of the potential contribution of co-authors can also be made by the student in consultation with the dissertation Sponsor, another committee member, or someone external to the dissertation committee. It is suggested that student use recommendations, such as those from the International Committee of Medical Journal Editors, as a guide to make determinations about authorship: (see http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html), which recommends that authorship be based on the following 4 criteria:
    - Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
    - Drafting the work or revising it critically for important intellectual content; AND
    - Final approval of the version to be published; AND
    - Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

    Dissertation committee members or external reviewers who may be appointed by the DPH Program at some time in the future to serve as 'examiners' for the purposes of quality control cannot serve as co-authors, but should be thought of more as 'peer reviewers'.

This guidance was first issued by the DPH Program in August 2015. It will be included in the DPH Program manual and updated annually and as the program accrues experience with the traditional dissertation model. Students and committees are expected to adhere to the most recent guidance from the DPH Program, regardless of when the student's dissertation research began.

Dissertation Defense - Checkpoints

The dissertation defense is open to the public. All committee members must be in attendance at the defense. Only the Outside Reader or the Optional Third Reader may, in extenuating circumstance, participate remotely. If both the Outside Reader and Optional Third Reader cannot attend in person, a different date must be scheduled. Questions, comments, or suggested revisions must be submitted to the committee Chair in writing at least 24 hours prior to the defense by a Reader who is not physically present. If the Outside Reader or Optional Third Reader has electronically attended, faxed/scanned email signatures for this purpose will suffice. All committee members will have read the full dissertation prior to the defense and will be prepared to pose questions and provide feedback/comments at the defense.

Student:

- The student has completed an original research project that addresses a particular public health problem or issue.
- The student has prepared a 10-15 minute formal presentation.

Sponsor:

- The Sponsor has worked closely with the student on the entire dissertation, helped select the committee and approve the dissertation for defense.

First Reader:

- The First Reader has reviewed and provided feedback on the dissertation as it progressed, approved the as the release of the dissertation chapters and the final full dissertation to the committee, and approved the dissertation for defense.

Chair:

- It is the Chair's responsibility to determine when the committee agrees that the dissertation is ready for defense, schedules the defense date, and runs the Defense - assigning the order of questioning, ensuring the productivity of the discussion, managing the voting and paperwork and reporting the outcome to the TC, EO and APO.
- The Chair has provided written feedback to the student on individual dissertation chapters and the full dissertation at least once prior to the defense.

Outside (Second) Reader(s):

- The Outside Reader (and optional Third Reader) has provided specific expertise and quality control.
- The Outside (and optional Third) Reader has provided written feedback to the student on the full dissertation at least once prior to the defense.

Other

- The APO will inform the GC Provost's Office of the defense who will then send a formal invitation to the committee and student.
- The APO will inform DPH Program faculty and students of the scheduled defense in the monthly DPH newsletter and by separate announcement.

Dissertation Defense Process

1. The defense should last approximately 2 hours, but the student and committee members should allow for up to 2.5 hours.

2. All committee members and the student are expected to arrive on time, turn off mobile devices, and remain in the room for the duration of the defense.

3. Immediately prior to the defense, the Committee will convene briefly and the Chair will check if there are any outstanding issues, describe the defense process and assign the order of the questioning. The Sponsor has the option of choosing to be the first or last questioner.

4. Once the Committee, Student, and Audience are assembled, the student will give a very brief (10-15 minute) presentation/overview of the dissertation to get the conversation started. Since all committee members will be intimately familiar with the content of the Dissertation by this point, this presentation should be 10-15 minutes in length, and in no cases should it be more than 20 minutes. This presentation should not detail all aspects of the dissertation, as all committee members will have read the dissertation in advance. It should summarize the gaps in the literature, specific aims, key findings and conclusions for each aim, and public health implications.

5. Each committee member will ask questions for approximately 15-20 minutes.

6. Audience members are allowed brief questions, moderated by the Chair.

7. After the questions end, the students and audience will be asked to leave the room.
   The Chair will facilitate a discussion of the quality of the dissertation and the defense. Then the committee will vote. There are four options,
   a) We certify that the candidate has passed the Final Examination. We accept the dissertation as presented;
   b) We certify that the candidate has passed the Final Examination. We will consider the dissertation acceptable after minor revisions are approved by the Sponsor;
   c) In our judgment the candidate's dissertation requires major revisions. It must be resubmitted for approval by the Sponsor and two members of the examining committee.*
   d) We certify that the candidate has failed the Final Examination, and make the following recommendations.

8. Committee members sign the signature page of the dissertation and the Report of Final Examination. The signature page original goes to the student and the original of the Report of Final Examination to the DPH Office for submission to the Provost' Office. The student cannot deposit without these signed documents.

*In this case, written feedback, prepared by the Sponsor and Chair, must be provided to the student on required revisions. The feedback must be shared with all committee members. The Sponsor and the Chair must review the revised dissertation to ensure that all revisions have been adequately attended to.

Student Professional Development

GC Interdisciplinary Concentrations

The Graduate Center offers a number of Interdisciplinary Concentrations. Some of these concentrations offer core courses, while others guide students in finding courses across different academic disciplines that fulfill the concentration requirements. When students finish the requirements for a concentration they are awarded a physical certificate but the IDS concentrations are not noted on their transcripts. The Interdisciplinary Concentrations include: Advanced Social Research, Cognitive Science, European Union Studies, Fashion Studies, Food Studies, Language and Literacy, Latin American and Caribbean Studies, Lesbian/Gay/Queer Studies, Psychology of Political Behavior, Public Policy and Urban Studies, Twentieth-Century Studies, and Urban Health and Society.

Concentrations will not appear on transcripts but the student will receive a hard copy document stating completion.

Many of these Interdisciplinary Concentrations offer Fellowships and Awards.

http://www.gc.cuny.edu/Academics-Research/Degree-Programs/Doctoral-Programs/Interdisciplinary-Concentrations

GC Interdisciplinary Certificate Programs

Interdisciplinary Certificate Programs are open to students enrolled in one of the existing doctoral programs offered at the Graduate Center. In addition to fulfilling the requirements of their doctoral program, students can choose to complete a Certificate Program.

Programs available to DPH students include: Africana Studies, American Studies, Demography, Film Studies, Interactive Technology and Pedagogy, and Women's Studies. Students who fulfill the requirements of a certificate program have this noted on their transcripts when they graduate.

Required courses for Certificate programs can be used, in some cases, as DPH electives. Meaning, a student in a certificate program may not need to take additional credits as the requirements for the DPH degree and the interdisciplinary certificate may overlap. This option should be discussed with the student's advisor and the director of the certificate program.

Certifications will appear on transcripts and the student will receive a hard copy document.

Many of these Interdisciplinary Certificate Programs offer Fellowships and Awards.

http://www.gc.cuny.edu/Academics-Research/Degree-Programs/Doctoral-Programs/Certificate-Programs

GC Professional Development Seminars

Students may register online for Professional Development Seminars. The courses are 0 credits and do not appear on student transcripts; they are free of charge and open to all matriculated doctoral students at the Graduate Center. Students register for them as they do their academic classes and can find them listed under "Professional Development" in the course schedule. For further information contact the Office of the Associate Provost at 212-817-7282 or RSponzo@gc.cuny.edu

http://www.gc.cuny.edu/Prospective-Current-Students/Student-Life/Professional-Development

GC Advanced Research Collaborative (ARC)

The Advanced Research Collaborative (ARC) extends the Graduate Center's global reach and prominence as an international hub of advanced study. Specifically, ARC promotes interdisciplinary research and partners with the Graduate Center's forty research centers, institutes, interdisciplinary committees, and other academic initiatives. Through its Distinguished Fellowship Program, a research-focused initiative, ARC will offer even more possibilities for collaboration between campus-based and Graduate Center faculty, in addition to visitors, doctoral students, and postdoctoral colleagues.

http://www.gc.cuny.edu/Academics-Research/Advanced-Research-Collaborative

GC Centers & Institutes
The Graduate Center is home to more than thirty interdisciplinary research centers and institutes focused on areas of compelling social, civic, cultural, and scientific concerns. Examples are the New Media Lab, Center for Lesbian and Gay Studies (CLAGS), and the Center for Urban Research.
Many of these Centers & Institutes offer Fellowships and Awards
http://www.gc.cuny.edu/Academics-Research/Advanced-Research-Collaborative/Centers-Institutes

GC Initiatives & Committees
http://www.gc.cuny.edu/Academics-Research/Advanced-Research-Collaborative/Initiatives-Committees

GC Student Business Cards
With permission from the APO, students may order GC business cards. The cards cost $17 for approximately 250. Order through the APO who will then direct you to the Office of Communications and Marketing.

Free Poster Printing at the GC
Free poster printing is available to GC students. Contact Ray Ring, Director of GC Building Design & Exhibitions rring@gc.cuny.edu 212-817-7394 and indicate that you are a student in the DPH program and include a 36" x 48" Power Point slide (which will be your poster) and include the GC logo on that slide. Logo is available by request. http://www.gc.cuny.edu/About-the-GC/Resource-Services/Communications---Marketing/Description-GC-Logo

Academic International Travel - GC Sponsored or Independent, documents required
Mandatory notification requirements and travel insurance for international academic travel by graduate students for independent research, internships, language study, practicums, conference attendance/presentation, or job interviews apply regardless of the source of funding. http://www.gc.cuny.edu/Prospective-Current-Students/Current-Students/International-Travel-Requirements-for-Current-Students

American Public Health Association Membership (APHA)
It is recommended that students join the American Public Health Association (APHA).The American Public Health Association is the oldest and most diverse organization of public health professionals in the world and has been working to improve public health since 1872. The Association aims to protect all Americans, their families and their communities from preventable, serious health threats and strives to assure community-based health promotion and disease prevention activities and preventive health services are universally accessible in the United States. APHA represents a broad array of health professionals and others who care about their own health and the health of their communities. http://www.apha.org/

Public Health Association of New York City Membership (PHANYC)
Public Health Association of New York City (PHANYC) Student Committee is dedicated to getting public health students more informed and involved in the activities of PHANYC, as well as helping to plan PHANYC activities which reflect the interests and needs of students in public health related fields in New York City.
http://www.phanyc.org/about/student.html

Career Services, Employment, Job Listserv/Lists, Awards, and Scholarships and Fellowships

Career Services

CUNY SPH Office of Student Services

The Office of Student Services has established a new initiative Interactive Student Centered Hub of Academia, Research and Entrepreneurship (I-SHARE). I-SHARE aims to facilitate student-centered environment through its various initiatives such as Mentoring program (Peer to Peer and Meet Alumni to enhance Career horizons, MATCH), Career Services, CUNY School of Public Health Student and Alumni Association, Student Innovation Initiative, and Student Resource Center.
sph.cuny.edu/student-services/

GC Office of Career Planning and Professional Development

As part of the 2011 Graduate Center Strategic Plan, the Graduate Center has launched a permanent central career planning and professional development office to prepare students for careers inside and outside the academy. Through one-on-one counseling, workshops, mentoring, job search resources, dossier review, internships, mock interviews and building relationships with employers and alumni, the Office of Career Planning and Development collaborates with faculty to ensure that GC students receive the best co-curricular training available as they prepare to enter the workforce.
http://careerplan.commons.gc.cuny.edu/

The GC Office of Career Planning and Professional Development sends weekly emails, holds online events and webinars, and has an online job search directory.
http://careerplan.commons.gc.cuny.edu/about/

DPH & CUNY SPH Employment

CUNY SPH Adjunct Positions

DPH students are encouraged to apply for adjunct positions at the CUNY SPH consortium schools (Brooklyn, Hunter, Lehman) or other four-year degree granting CUNY schools. Calls are sent via the DPH Jobs Listerv, see below. Students teaching under an adjunct line are eligible to apply for the CUNY Tuition Award. See page 75 for additional eligibility.

DPH & CUNY SPH Research Opportunities for DPH Students

A periodically updated listing of current DPH and CUNY SPH Faculty Research on which students may apply to work as paid and unpaid research assistants or as an independent study is posted on Black Board. Depending on the listing, benefits may be available. Students working on a graduate assistantship line are eligible to apply for the CUNY Tuition Award. See page 75 for additional eligibility.

Please be aware that GC doctoral students cannot act as Teaching Assistants or be asked to grade the work of peers in the same program that they are attending.

DPH Student and Alumni Job Listserv

DPH students and Alumni can subscribe and unsubscribe from the DPH job search listserv. First Register LISTSERV Password and then subscribe and unsubscribe here.

GC and CUNY Job Listings

Graduate Center jobs are listed on the Jobs at the GC page.
http://www.gc.cuny.edu/About-the-GC/Resource-Services/Human-Resources/Jobs-at-the-GC

CUNY-wide positions can be searched for on the CUNY Employment page.
http://www.cuny.edu/employment.html

DPH & CUNY SPH Awards

CUNY SPH Dean's Dissertation Grant

The Dean of the CUNY School of Public Health has committed to fund a limited number of DPH dissertation grants each year. The grant funding period is 12 months. All research funded by the grant must be completed within 12 months of receiving funding, and recipients must submit a final report of the activities completed for the grant and a final budget report detailing spending within 15 months following receipt of the grant.

Students in the Doctor of Public Health (DPH) program who have successfully defended their dissertation proposal are eligible to apply for this funding opportunity to help support the costs associated with dissertation research. In order to be eligible for a Dean's Dissertation Grant, students must be (1) actively enrolled and in good standing in the DPH program at the CUNY Graduate Center, (2) have successfully defended their dissertation proposal, and (3) Have received IRB approval for their dissertation proposal (or have been deemed exempt by the IRB).

Priority for these funds will be given to students who have also applied for external funding.

Proposals for this grant are usually accepted twice a year and the due dates will be announced via email. Additional requirements to apply for the CUNY SPH Dean's Dissertation Grant are part of the application located on Blackboard.

DPH Conference Presentation Travel Award

When funds are available, calls for applications will be sent via email for the DPH Conference Presentation Travel Award. This award is intended to fund DPH students who have been invited to give oral presentations at conferences other than APHA, or poster presentations at any conference (including APHA). Detailed eligibility requirements will be included with the call, which usually goes out towards the end of the spring semester. Students may submit proposals to cover the expenses related to conferences that they already attended or plan to attend during the current academic year.

CUNY SPH APHA Oral Presentation Awards

The CUNY SPH Dean has agreed to fund DPH students who have been invited to give an oral presentation at the annual APHA meeting. Calls for applications will be sent via email for students presenting an oral paper at APHA.

GC Institutional Aid

CUNY Tuition Award- GC Office of Financial Aid

Calls for nomination are sent via email within the first few weeks of each fall and spring semester. This award is not available during the summer. The award covers only New York State tuition charges. If an out-of-state or international student is eligible, they must pay the difference between their tuition charges and the NYS charges at the same level.

Eligibility:

1) Registered full time (7 or more credits);
2) A doctoral level student;
3) Teaching a minimum of 3 credits at a CUNY institution on an adjunct line or be on a graduate assistantship line;
4) Be within your first 10 semesters of attendance in the program;
5) Not have tuition covered by any other tuition award.

http://www.gc.cuny.edu/Prospective-Current-Students/Current-Students/Financial-Assistance/GC-Institutional-Aid

GC Certificate Program GC Centers & Institutes Fellowships/Awards

Please check the Professional Development section of this manual on page 71 for information on all available Certificate and Interdisciplinary Concentrations of which many offer Fellowships and Awards. The below are examples that are currently known to be available to DPH students.

Demography Fellowship (available to students enrolled in the Demography Certificate Program)
Continuing students should apply by submitting the following materials to Demography Certificate Program Coordinator, Shiro Horiuchi shoriuch@hunter.cuny.edu and to CIDR Director, Neil Bennett Neil.Bennett@baruch.cuny.edu: Curriculum Vitae, transcripts, any relevant publications, a 1-2 page description of research interests, and progress toward the dissertation, if applicable.
http://www.cuny.edu/about/centers-and-institutes/cidr/cpd.html

Women's Studies Fellowships & Awards

Please check each award's details as some are available only to students enrolled in the Women's Study Certificate Program, while others are available to all GC students.
Since 1977, the Center for the Study of Women and Society has promoted interdisciplinary feminist scholarship. The focus of the Center's research agenda is the study of gender, sexuality, race, ethnicity, class and nation in relationship to the experiences of women and men in societies around the world.
http://web.gc.cuny.edu/womenstudies/center/fellowships.html#Heilbrun

New Media Lab

THE NEW MEDIA LAB (NML) works with Graduate Center and CUNY faculty and doctoral students from a variety of academic disciplines to conceive and create groundbreaking multimedia projects based on student and faculty scholarly research. Our goal is to integrate digital media into traditional academic practice, challenging scholars to develop fresh questions in their respective fields using the tools of new technology. The NML is committed to a vision of new technology based on open access to ideas, tools, and resources. With ongoing support from CUNY, the New Media Lab has become a dynamic environment in which projects funded by the National Endowment for the Humanities, the Rockefeller Foundation, and other private and public sources demonstrate new approaches and methods of merging digital media, scholarship, and learning.
http://newmedialab.cuny.edu/

CUNY SPH Centers & Institutes
CUNY School of Public Health faculty are affiliated with several City University of New York research centers and institutes. These provide opportunities for faculty and student research.
http://sph.cuny.edu/research/centers-institutes/

GC Office of Research and Sponsored Programs
The Graduate Center Office of Research and Sponsored Programs (RSP) is the central administrative unit for overseeing GC-CUNY applications for, and awards of, governmental and foundation funding. The RSP is ready to answer questions about proposal preparation, submission, and administration for the entire GC Community including faculty and staff, Research Centers and Institutes, and, of course, students!

Funding opportunities, searchable databases as well as information on the Doctoral Student Research Grant Program, can be found at the link below.

Doctoral Student Research Grant Program (DSRG)
The mission of the Doctoral Student Research Grant Program is to foster a research-oriented academic culture among doctoral students and to encourage interdisciplinary discourse at the CUNY Graduate Center by: (a) providing incentives for students to model and meet, early in their careers, the requirements for succeeding in the competition for funds by clearly defining a problem, a project, and a realistic budget; (b) providing an occasion for faculty-student mentoring relationships that are oriented around the concrete problems of proposing, planning for, and executing research; and (c) furthering student professional progress by providing funds for pre-doctoral research publications, presentations, and professional networking. Applications are usually due in December or January.

http://www.gc.cuny.edu/About-the-GC/Resource-Services/Sponsored-Research-Grant-Funding

CUNY-Wide Scholarships &Fellowships

CUNY listings of available scholarships
Be aware that this section of the general CUNY website includes scholarships for all levels of higher education.
http://www.cuny.edu/admissions/financial-aid/scholarships.html

Macaulay Honors College Instructional Technology Fellows (ITFs)
Doctoral students in all disciplines at the CUNY Graduate Center are welcome to apply for the ITFs fellowship. Applicants must be currently registered full-time doctoral students at the CUNY Graduate Center in good academic standing to apply, and if selected as ITFs, must be registered, in good academic standing, and at level II or III at the CUNY Graduate Center during the period of the fellowship. Applicants should be interested in integrating technology and pedagogy for the benefit of students and faculty, both inside and outside of the classroom. They should also be eager to participate with other Instructional Technology Fellows in a multidisciplinary environment whose focus changes semester to semester.
http://macaulay.cuny.edu/eportfolios/itfprogram/

Federal Assistance

Federal Work Study

Federal Work-Study awards are based solely on financial need as defined by federal law. Federal Work-Study awards are packaged each spring for the following academic year. Because Federal Work-Study funds are limited, only students who have their FAFSA on file by the priority deadline (April 30th) are initially considered for awards. Federal Work-Study positions are assigned by the Executive Officer.

Fulbright U.S. Student Program- GC Provost's Office

Established in 1946, the Fulbright Program aims to increase mutual understanding between the peoples of the United States and other countries, through the exchange of persons, knowledge, and skills. Sponsored by the U. S. Department of State, Fulbright, the largest U.S. international exchange program, provides funds for students, scholars, and professionals in all fields of study to undertake international graduate study, advanced research, university teaching, and teaching in elementary and secondary schools.

Fulbright-Hays Doctoral Dissertation Research Abroad Program (DDRA)- GC Office of the Vice President for Student Affairs

The Fulbright-Hays Doctoral Dissertation Research Abroad Program (DDRA) funds individual doctoral students to conduct research in modern foreign languages and area studies for periods of 6 to 12 months. This program is sponsored by the U. S. Department of Education (ED) and is not related to the IIE Fulbright program, which is run by the State Department. The Fulbright-Hays DDRA Program is for students who intend to conduct dissertation research outside of the United States, excluding the countries of Western Europe, and is of particular interest to (but not limited to) students in the social sciences.

http://www.gc.cuny.edu/Prospective-Current-Students/Current-Students/Financial-Assistance/Federal-Assistance

Student Community

CUNY Academy Health Student Chapter

Initiated by DPH students, the CUNY Academy Health student chapter aims to encourage the exchange of knowledge, dissemination of research findings, and networking amongst Graduate Center students in health services research and health policy.
For more information on our AcademyHealth student chapter and how to join Academy Health, please email CUNYacademyhealth@gc.cuny.edu
cunyacademyhealth.ws.gc.cuny.edu
facebook.com/CUNYAcademyHealth
facebook.com/groups/CUNYAcademyHealth
linkedin.com/groups?home=&gid=8260481

The Doctoral Students' Council (DSC)

The Doctoral Students' Council (DSC) is the sole policymaking body representing students in doctoral and master's programs at The Graduate Center of The City University of New York.

The DSC allocates a certain amount of money each academic year to the DPH program. These funds will be used as deemed appropriate by the elected student representative.
www.cunydsc.org/
opencuny.org/dscfac/
facebook.com/cunydsc
See page 4 for more on the DSC.

DPH and CUNY SPH Committees

DPH and SPH committees have student representation. Student representatives in DPH committees represent DPH students. This includes going to meetings (once a semester, sometimes more or less), reporting any concerns students have, and also reporting back to the student body any issues or concerns that representatives feel they should know about. Calls for nominees and voting occurs every Fall semester. DPH Executive Committee (3 positions), DPH Elections Committee (1 position), DPH Admissions and Awards Committee (2 positions), DPH Curriculum and Examinations Committee (2 positions), DPH Faculty Appointments Committee (2 positions). SPH committees SPH Faculty-Student Council (1 position), SPH Curriculum Committee (1 position), SPH Assessment Committee (1 position). Incoming and continuing students are encouraged to participate.
See pages 3-4 for more DPH and CUNY SPH governance and student participation.

The CUNY Academic Commons

The CUNY Academic Commons is part of the City University of New York. We are dedicated to the free expression of our users in a collaborative and sharing environment. We are a community that seeks to use the Academic Commons as a means of fulfilling our highest aspirations for integrating technology into our teaching, learning, and collaborating. Members of the faculty, administration, staff, and graduate students of the City University of New York may register on the Site. We will take all reasonable measures to keep information and users safe.
Check the commons for scholarship, fellowship, and award opportunities.
http://commons.gc.cuny.edu/

OpenCUNY
The OpenCUNY Academic Medium is a student-based, open-source, academic, participatory digital medium for the CUNY Graduate Center community.
To date, OpenCUNY has worked with GC students to develop interactive open-source environments for chartered organizations, student associations, GC-based courses, student-run conferences, graduate research, health initiatives, student activism, personal websites, and an array of DSC initiatives.
http://opencuny.org/

Graduate Center Student Intervention Team (GCSIT)
The Graduate Center Student Intervention Team (GCSIT) supports a healthy and safe on-campus environment by assisting students whose behavior is worrisome or disruptive.
Any member of the college community can reach out to the GC Student Intervention Team to report a concern about a student through our on-line reporting form or by calling a the Student Affairs Office at x 7400. The GCSIT will review the report and take appropriate action. Reports may be made confidentially.
www.gc.cuny.edu/Prospective-Current-Students/Student-Life/Resources/Behavioral-Intervention-Team-%28BIT%29

Facebook - CUNY Graduate Center DPH Student Group
The DPH program has a student run Facebook group page.
facebook.com/groups/CUNYDPH/

Facebook - CUNY SPH
facebook.com/CUNYSPH

LinkedIn - CUNY SPH
linkedin.com/grp/home?gid=8244346

Twitter - CUNY SPH
twitter.com/CUNYSPH

Student Electronic Resources

GC Email Accounts
It is a policy of the GC that students regularly check their GC email accounts. Please note that students redirect at their own risk and it is recommend students periodically check their GC email account as they will need to change passwords at least annually. As of May 2015, students are required to have an @gradcenter.cuny.edu email address. This does not apply to faculty or staff who continue to use @gc.cuny.edu addresses.

Banner ID
All GC students are assigned a Banner ID number. This nine digit number is the unique identifier that students use for all administrative purposes with the GC.

The Graduate Center's Preferred Name Policy
While CUNY recognizes the importance that a change of name might have to students during their time with the University a preferred name is not a legal name, but is generally used to change how others refer to you. For this purpose, students may identify a preferred name to be recorded in the student system. Documents and records that may display a preferred name include, among other things, course rosters, student identification cards, student email addresses, and other documents issued by the University. A preferred name will not be reflected on, among other things, a student's official academic record, diploma, or transcript. To change the name that is displayed/reflected on the official academic record, diploma, or transcript students must follow the instructions on the Name Change Request Form available in the Registrar's Office. Official and legal name changes require specific documentation outlined on that form. The preferred name request form is available on the Registrar's webpage.

Blackboard
Blackboard is an online course management system. In addition to courses that students are registered for, all DPH students have access to CUNY SPH and DPH student Blackboard organizations.

The GC Student Handbook
The Student Handbook for the Graduate Center (GC) of the City University of New York (CUNY) available at http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/Student_Handbook_web.pdf?ext=.pdf. This handbook describes all relevant GC policies and is the official document for students at the Graduate Center. Students are encouraged to review this handbook and are expected to be familiar with all relevant GC policies.

Manhattan Research Library Initiative (MaRLI)
Any New York Public Library cardholder in good standing is eligible to apply to participate in a new library service that offers an unprecedented level of access to our collections. The Manhattan Research Libraries Initiative (MaRLI) offers approved NYPL cardholders the ability to borrow select research library material for at-home use for the first time ever. Additionally, MaRLI participants will be granted access to select materials owned by Columbia University and NYU.
http://www.nypl.org/help/research-services/MaRLI

CUNY Libraries Offer Free Access to the New York Times
Register for the NYTimes Academic Pass for free access through the NYTimes website and smartphone apps. If you already have a personal NYTimes subscription, read this post to find out how to cancel it and resubscribe through the Academic Pass. It also includes updated instructions about what to do if you already have a nytimes.com account (free or paid) tied to your CUNY email address.
http://gclibrary.commons.gc.cuny.edu/2014/04/09/free-nytimes/

Information for DPH Faculty Members

DPH Faculty Members- Roles, Duration, Course Release & Responsibilities

Role	Term	Course Release	Responsibilities
Executive Officer	Three academic years	Four course releases per year (12 credits total)	See Bylaws and above
The Deputy Executive Officer	One academic year	Two course releases per year (6 credits total)	See Bylaws and above
Track Coordinator	Three academic years	Two course releases per year (6 credits total)	See Bylaws and above
Advisor	Until dissertation stage	No course release	See Bylaws and above
Faculty Member	Three academic years, with option for renewal	Releases for defined activities as shown on this chart	See Bylaws, above, and PSC-CUNY contract
Chair of a DPH Committee	Three academic years	No course release	See Bylaws and above
Member of a DPH Committee	Three academic years	No course release	See Bylaws and above
Chair of First Exam Committee	One exam, as assigned	No course release	Chairs Faculty Committee that rates First Exam
First or Second Reader of First Exam(s)	One exam, as assigned	No course release	See above
Sponsor, Chair, and Member on a Second Exam Committee	From proposal to pass of second exam	No course release	See above
PUBH 900 Supervised Dissertation Research: Dissertation Sponsor	From dissertation proposal to defense	One course release for each 5 semesters of sponsorship§ (can be accrued but not banked) (3 credits total)	See above
Chair and Reader on a Dissertation Committee	From dissertation proposal to defense	No course release	See above
PUBH 861 Independent Study: Faculty Sponsor	From registration to completion	One course release for each five semesters of supervision can be accrued§ (3 credits total)	See above

§For example, sponsoring one student for five semesters or five students for one semester each both result in one course release. Once one release has been accrued it must be used.

GC Elimination of the use of Gendered Salutations and References of Students
Effective Spring 2015, the GC's policy is to eliminate the use of gendered salutations and references in correspondence to students, prospective students, and third parties.

Instructor to Student Course Ratio
A course will run with a minimum of five registered Graduate Center students. Courses that are team taught by two instructors require a minimum of 12 GC students. However, the decision that a course requires to be team taught is an academic decision, not one based simply on headcount and requires approval of the EO. A second instructor will not be added to a course after the first day of registration for continuing students unless the Provost has reviewed the program's reason for the requested and grants permission.
Minimum enrollment excludes auditors, non-matriculated students, and CUNY masters and undergraduate permits. The single exception is the PUBH 898 Dissertation Seminar where a minimum headcount enrollment that includes Level 3 auditors (PUBH 900) is acceptable.

CUNY SPH Syllabus Templates
All DPH course syllabi must follow the required SPH format. Templates with DPH core and track competencies are on Blackboard.
Faculty are to submit syllabi upon request from the DPH and/or CUNY SPH offices for records and to maintain accreditation.

Higher Education Opportunity Act Mandate to Notify Students about Required Course Texts
The College is required by the Higher Education Opportunity Act to make the costs of required course materials known to students when they register for classes.
It is necessary to report all required materials for a course that is running. For situations when an instructor does not know the edition of a book, a sample ISBN may be entered. If no texts are required note "no required texts." If at the time of entry you do not know which texts you plan to use, select texts you are likely to use and note "subject to change."

Change of Grade Forms
Faculty request a Change of Grade Form from the APO. Change of grade forms may only be signed and submitted by the instructor to the APO.

Notes on Admissions
The GC Admissions Office puts a hold on accepted applicants who have accepted our offer only when they have not completed a required degree (e.g. MPH). If the accepted applicant is missing Masters Core (Biostatistics; Epidemiology; Environmental Health; Social and Behavioral Dimensions of Health; & Health Policy and Management), the GC does not track this information and it is a responsibility of the student, advisor, and TC to do so.
Accepted students who wish to defer must write an email appealing to defer to the Chair of the Admissions Committee, the Track Coordinator, or the EO. The Chair notes the deferral to the GC Admissions Office either directly or via the APO.
If an incoming student wishes to take a Leave of Absence, they must instead defer.

Faculty Hiring DPH Students
Students may work as research assistants by individual grant holders, but may not act as Teaching Assistant or Graders in the same program that they are attending.

DPH Reappointment
Faculty will be requested to submit a self-assessment report along with a current CV for reappointment to the DPH program. Reappointments occur every three years.

Graduate Center Faculty Policies & Information
Please check the Graduate Center Governance, Policies, & Procedures links for additional information on GC faculty related regulations.
gc.cuny.edu/About-the-GC/Resource-Services/Governance-Policies-Procedures
gc.cuny.edu/Faculty

Room Reservation/Office Space
DPH faculty may make use of the conference room in 3317 at the Graduate Center by reservation only. It should be known that this space is shared by another Graduate Center doctorate program and is not available to the DPH program on Fridays. The conference room in 3317 can be reserved for office hours only by contacting the APO. Larger conference spaces and seminar rooms can be reserved by contacting the APO. The conference room should not be requested for regular class meetings.
Rooms must be requested two weeks in advance and no less than one week in advance.

GC Faculty Building Access After-hours
Faculty may request to the EO to grant after-hours authorization to the Director of Security & Public Safety.

GC Faculty ID Cards
Graduate Center ID Cards can only be obtained in person during regular business hours. Faculty and instructors should contact the APO to request a card. ID Cards require a valid ID Sticker for each semester which can be retrieved from the APO.
Lost ID Cards need to be reported immediately to the Office of Security at (212) 817-7777.

GC Faculty Computer Login and E-Mail Account
A valid Graduate Center Computer Account is required to access computers at the Graduate Center. Once an instructor is appointed to the faculty of The Graduate Center, the APO will contact the faculty member with the required Computer Account User ID and Password. The faculty member will be responsible for creating new his/her password. Problems with GC computers and email should be addressed to the GC Help Desk Helpdesk@gc.cuny.edu (212) 817-7300.
Additionally, it is a GC policy that faculty regularly check their GC email accounts or have it forwarded to their primary CUNY email account.
https://wa.gc.cuny.edu/owa/auth/logon.aspx?url=https://wa.gc.cuny.edu/owa/&reason=0

Faculty Courses in Blackboard
All Blackboard courses are hosted on centralized servers at CUNY CIS. DPH courses are created automatically using data provided by the Graduate Center Registrar's Office. Co-listed courses with the CUNY SPH consortium can be merged (e.g. PUBH 820 Epidemiologic Methods I/EPI 750/ PHE 723). If you are able to log in successfully as a faculty member but do not see your courses listed or need help merging courses, contact the GC Blackboard Administrator directly, Achia Samuels asamuels@gc.cuny.edu 212-817-7314 and/or the Help Desk helpdesk@gc.cuny.edu 212-817-7300.

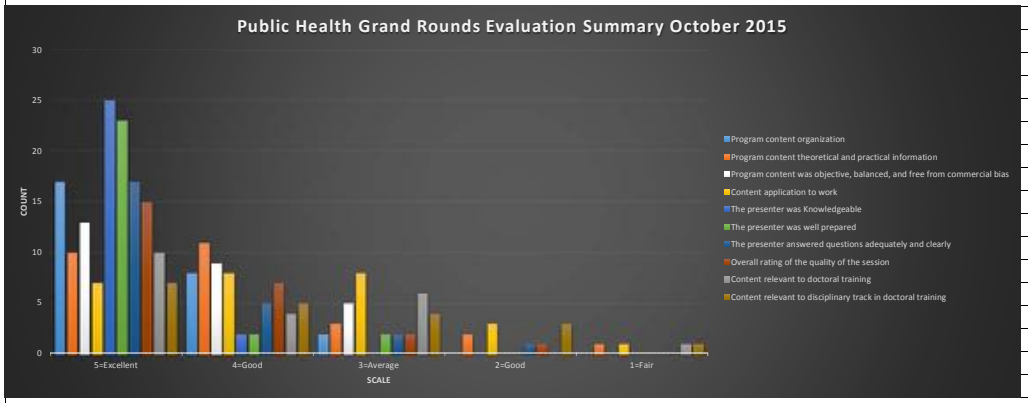
Faculty Web/Banner
Unlike all other CUNY campuses, the GC uses Faculty Web for attendance and grade recording.
To access Faculty Web, use your 9-digit Banner ID. Upon appointment, you will be notified of your Banner ID. When logging in, be sure to use all the digits including the lead zeros. Your Banner ID and PIN will be the same from semester to semester. Problems with Banner and logging into Banner should be addressed to the GC Office of the Provost at 212-817-7200 provost@gc.cuny.edu.
https://ssb.gc.cuny.edu/prod/plsql/twbkwbis.P_WWWLogin

CUNYfirst and the GC
The GC has not fully transferred over to using CUNYfirst and it is not expected to do so until Fall 2016.

Presenter	Debrework Zewdie, PhD
Title	Leadership in Public Health: From AIDS to Universal Health Coverage
Date	10/05/15
No. in Attendance	46
No. Evaluations	27
Response Rate	59%

5=Excellent/ 4=Good/ 3=Average/ 2=Fair/ 1=Poor

Summary	Program content organization	Program content theoretical and practical information	Program content was objective, balanced, and free from commercial bias	Content application to work	The presenter was Knowledgeable	The presenter was well prepared	The presenter answered questions adequately and clearly	Overall rating of the quality of the session	Content relevant to doctoral training	Content relevant to disciplinary track in doctoral training
5=Excellent	17	10	13	7	25	23	17	15	10	7
4=Good	8	11	9	8	2	2	5	7	4	5
3=Average	2	3	5	8	0	2	2	2	6	4
2=Good	0	2	0	3	0	0	1	1	0	3
1=Fair	0	1	0	1	0	0	0	0	1	1



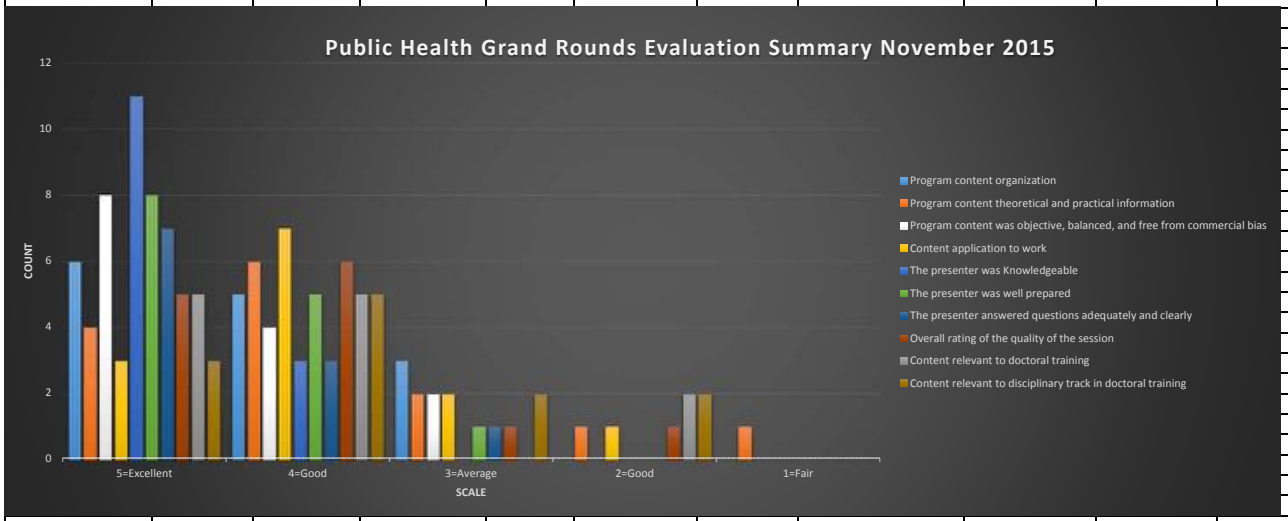
Role	Program content organization	Program content theoretical and practical information	Program content was objective, balanced, and free from commercial bias	Content application to work	The presenter was Knowledgeable	The presenter was well prepared	The presenter answered questions adequately and clearly	Overall rating of the quality of the session	Content relevant to doctoral training	Content relevant to disciplinary track in doctoral training	Suggestions for improvement	Strengths of the presentation	Additional comments/Explanations	Suggestions for future topics and formats
DPH student	4	4	3	1	5	5	5	5	4	4				
DPH student	5	5	5	5	5	5	5	5	5	5	Allocate more time for presentation	Real world application		
SPH faculty	4	1	3	4	5	5	5		NA	NA	UHC in the title of the presentation	The speaker was professional and inspiring		
DPH student	5	5	5	5	5	5	5	5	5	5	Microphone	Speaker was amazing		Politics in Health; How to navigate changing administration
DPH student	5	5	5	5	5	4	5		5	5				
SPH faculty	5	4	4	4	5	5	5	5	NA	NA	Include a slide for key outline of skills and abilities that students have for MPH and DPH	Speaker was 5		
DPH student	4	3	5	3	5	5	4	4	3	3	was more specific to AIDS, would have been interesting to hear more application to other health issues	Depth of speakers Knowledge		
DPH student	5	4	5	4	5	5	4	5	5	4			Very insightful for someone with plans to work in global health	Make these slides available online

DPH student	3	2	3	2	5	3	3	3	3	2	The content was too broad to learn applicable lessons from , the speaker had a lot of assumptions, which left me with questions rather than answers	The speaker was well known in the field		Based on the past lectures Leadership is too broad a topic for grand rounds
DPH student	4	5	5	3	5	5	4	4	3	2				
DPH student	5	5	5	4	5	5	5	5	5	5				
DPH student	5	3	4	2	5	5	5	4	4	2	More discussion on integration of perspectives of general population	personal anecdotes were interesting and strengthened the presentation		Domestic health issues and policy initiatives
DPH student	5	4	4	5	5	5	5	5	5	5				
SPH faculty	5	4	3	4	5	5	5	5	NA	NA	The presentation should be expanded into a course	summarizing decades of experience into a lesson on leadership		population interventions such as MTO
DPH student	4	4	4	4	5	5	5	4	4	4	More discussion on how to develop gross roots organizations in these countries	Experience of the presenter		More presentations on edit topics
DPH student	5	5	5	5	5	5	5	5	5	5		The presenter was extremely knowledgeable and presented information in a very clear and interesting way		
DPH student	5	5	5	3	5	5	5	5	5	NA	Could be little short	History, science, leadership		
SPH faculty	4	4	4	5	5	5	4	5	NA	NA				
DPH student	4	4	4	4	5	5		4	3	3		Clear presenter, Knowledgeable, 4 overall picture		
SPH faculty	5	4	4	3	5	5	5	5	NA	NA				
DPH student	5	5	5	3	5	5	5	5	5	4				
DPH student	5	5	5	5	5	5	5	5	5	5		Energy and attitude of presenter	More presentations at this level, Great presenter very inspiring	Round table where presenter share in less formal lecture form but guide interactive sessions of more depth involvement
Other CUNY	5	4	4	4	5	5		4	NA	NA	Increased audience participation, I would have liked to hear more of her personal experiences to audience to altitude those goals	very detailed history		Buying/selling in black markets, addressing New York city's vast wealth and health disparities
DPH student	5	5	5	3	5	5	5	5	3	3	I thought this was an 5 presentation and I whole heartedly agree with the presenters viewpoint , nothing really needs improvement	Realistic perspective, important viewpoint as someone from a country where there is a lot of development work being done	while this was a great presentation since in now at the point of working on my dissertation proposal I would actually like to spend more time in research seminars-2 where I could workshop with other students and devote lots of time to moving forward the proposal	
DPH student	4	3	4	3	4	4	3	3	3	3	More specific to practical documentation for strengthening leadership, clear resources for access post presentation	Presenter knowledge and experience		

DPH student	5	4	5	3	5	5	4	4	4	4	More personal experience, especially within the context of leadership it would have been useful to hear more about her experience as a woman of color in leadership position	clear , organized presenter is charismatic, very likeable		
DPH student	3	2	3	2	4	3	2	2	1	1	Better use of microphone,, deeper theoretical framework, more facts	personal anecdotes	last two presentations have been superficial and not truly challenging or deeply informative	since our focus is urban public health the international breakers should demonstrate what that looks like in other urban settings

Presenter	David Hipgrave MBBS, PhD, FRACP													
Title	Priorities and Challenges in Global Child Health in the Era of the Sustainable Development Goals													
Date	11/02/2015													
No. in Attendance	34													
No. Evaluations	14													
Response Rate	41%													
5=Excellent/ 4=Good/ 3=Average/ 2=Fair/ 1=Poor														

Summary	Program content organization	Program content theoretical and practical information	Program content was objective, balanced, and free from commercial bias	Content application to work	The presenter was Knowledgeable	The presenter was well prepared	The presenter answered questions adequately and clearly	Overall rating of the quality of the session	Content relevant to doctoral training	Content relevant to disciplinary track in doctoral training
5=Excellent	6	4	8	3	11	8	7	5	5	3
4=Good	5	6	4	7	3	5	3	6	5	5
3=Average	3	2	2	2	0	1	1	1	0	2
2=Good	0	1	0	1	0	0	0	1	2	2
1=Fair	0	1	0	0	0	0	0	0	0	0



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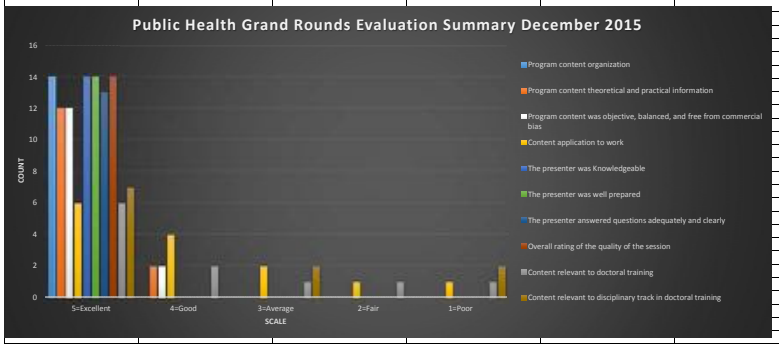
DPH student	5	4	5	3	5	4	5	4	5	5	Technical difficulty with slides	interesting data		
DPH student	3	3	4	4	4	4	4	4	4	4				
DPH student	4	5	5	4	5	5		5	5	5		good figures		
DPH student	4	4	4	4	5	5	5		5	3				
DPH student	5	5	5	NA	5	5	5	5	2	2	more time for discussion less time for speaking	lots of facts and figures representing the topic		
DPH student	5	4	5	4	5	5	4	4	4	4	synthesize clear topic, slightly long and repetitive, the first half of presentation	good examples on importance of sub-external level data	some what repetitive, slides/data, keep emphasizing the same point rather than build on each other	

DPH student	4	4	5	4	5	5		4	4	3	more time foe questions	diversity of data nice data visualization some cutting edge findings		
SPH faculty	4	4	3	4	4	4	4	3	NA	NA	The slides were difficult to read increase the font and reduce number of graphs the presenter referred to proportions when absolute values were used	the topic area is given appropriate and pushing for current public health issues on health and development	the presenter presented absolute numbers as proportions and rates this is misleading	social epidemiology and aging
DPH student	5	4	5	4	5	5	5	5	5	4		Global issues and perspective generally not enough at CUNY DPH		
DPH student	3	2	3	2	4	3	3	2	2	2	It was mostly a presentation of data not enough focus on interventions or his personal experience in this field of work			
Outside CUNY	5	5	5	5	5	5	5	5					The stats were beautiful	
DPH student	4	3	4	5	5	4		4	4	4	Slide minimum per speaker, time cards for speaker	speaker presented fantastic data		sexual reproductive health rights in the US post ACH (birth control, abortion)
DPH student	5	5	5	5	5	5	5	5	5	5				please add opportunities for follow up, either possible work up speaker, within CUNY, course work etc.
DPH student	3	1	4	3	5	4	5	4	4	4	Lots of slides more inclusion of personal experiences would have been useful			provide resources related to topic for review of prior

Presenter	Sten Vermund, MD, PhD
Title	A Critical Look at HIV Prevention Research into 2016: TasP, PrEP, and Circumcision
Date	12/14/15
No. in Attendance	48
No. Evaluations	14
Response Rate	29%

5=Excellent/ 4=Good/ 3=Average/ 2=Fair/ 1=Poor

Summary	Program content organization	Program content theoretical and practical information	Program content was objective, balanced, and free from commercial bias	Content application to work	The presenter was Knowledgeable	The presenter was well prepared	The presenter answered questions adequately and clearly	Overall rating of the quality of the session	Content relevant to doctoral training	Content relevant to disciplinary track in doctoral training
5=Excellent	14	12	12	6	14	14	13	14	6	7
4=Good	0	2	2	4	0	0	0	0	2	0
3=Average	0	0	0	2	0	0	0	0	1	2
2=Fair	0	0	0	1	0	0	0	0	1	0
1=Poor	0	0	0	1	0	0	0	0	1	2



Role	Program content organization	Program content theoretical and practical information	Program content was objective, balanced, and free from commercial bias	Content application to work	The presenter was Knowledgeable	The presenter was well prepared	The presenter answered questions adequately and clearly	Overall rating of the quality of the session	Content relevant to doctoral training	Content relevant to disciplinary track in doctoral training	Suggestions for improvement	Strengths of the presentation	Additional comments/Explanations	Suggestions for future topics and formats
DPH student	5	5	5	4	5	5	5	5	4	5		Inserted practical research takeways		
DPH student	5	5	5	4	5	5	5	5	5	5		Nice mixture of practical experience tied in with ideas on study design		
DPH student	5	4	5	3	5	5	5	5	3	3	it would have been helpful to learn more about the conceptualization and implementation processes otherwise was great			
DPH student	5	5	4	5	5	5	5	5	5	3		Very engagaing, great speaker		policy, racial equity, cross cutting issues (eg labor+health, etc)
SPH staff	5	5	4	5	5	5	5	5	NA	NA				
SPH faculty	5	5	5	5	5	5	5	5			this was an excellent presentation	the presenter was knowlegeable entertaining, engaged/ engaging, explained concepts thoroughly,	we need more speakers like him	can we approach lisa berkaman, wanly krileger, or sv subramaniah, (aging, race, multilevel interventions in PH)
DPH student	5	5	5	4	5	5	5	5	4	5		this was the best grand round presentation, great combinationof theory and practice, deep elaboration of		
DPH student	5	5	5	3	5	5	5	5	5	5	very interesting topic	very clear and interresting		
DPH student	5	5	5	2	5	5	5	5	2	1				
Other CUNY	5	5	5	5	5	5	5	5	5	5	Beeing taped	comprehensive coherent tale of classic public health		gun violence
DPH student	5	5	5	1	5	5	5	5	1	1	excellent presentation			policy management, economics, community health interventions, documentataion film, health communications
DPH student	5	4	5	5	5	5		5	5	5		great information		
SPH faculty	5	5	5	5	5	5	5	5						
DPH student	5	5	5	4	5	5	5	5	5	5				

Grand Rounds Evaluation Form

CUNY SCHOOL OF PUBLIC HEALTH

Your comments are very important to us! Please complete this evaluation so that we may provide more quality presentations in the future.

Which of the following best describes your role with the CUNY SPH?

_____ DPH student
_____ MPH student
_____ SPH faculty
_____ SPH staff
_____ Other CUNY
_____ Outside CUNY

5 = Excellent / 4 = Good / 3 = Average / 2 = Fair / 1 = Poor

The content was well organized.	5 4 3 2 1
The content had a good blend of theoretical and practical information.	5 4 3 2 1
The program content was objective, balanced, and free from commercial bias or influence.	5 4 3 2 1
I will be able to apply this content to my work.	5 4 3 2 1
The presenter was knowledgeable.	5 4 3 2 1
The presenter was well prepared.	5 4 3 2 1
The presenter answered questions adequately and clearly.	5 4 3 2 1
Your overall rating of the quality of the session.	5 4 3 2 1
For Doctoral Students Only:	
The content was relevant for my doctoral training broadly.	5 4 3 2 1
The content was relevant for my doctoral training within my disciplinary track.	5 4 3 2 1

How could this presentation be improved?	
What were the strengths of this presentation?	
Additional Comments/Explanations	
Suggestions for future topics and formats	

Thank you for your feedback!